SEPTEMBER.

GUIDED BY MINERVA, MERCURY IS BEARING SCIENCE ROUND THE WORLD.

In selecting such a group of mythological divinities, as the frontispiece for our first number of the second volume, we protest against the charge both of vanity and heathenism. It is but a small portion of the globe that we expect to enlighten, nor do we even hope to give light enough to the regions visited by our Magazine. If we can contribute only a *mite*, we think we shall not be called presumptuous in adopting the device; and it is the *attempt* rather than the *fruit* of our labors, to which we would be understood to refer. And as to heathenism, it is only complying with long established custom in such matters, to allude to the imaginary deities of ancient times, to indicate a literary object or plan. Though we make allusions to the pagan classics, we trust the character of the work for the last eight months at least, will show our deep and reverent regard for whatever is Christian, and our decided, though temperate disapprobation of whatever is *anti-christian*.

Piety and Baconianism meet in the American Magazine of Useful and Entertaining Knowledge for September, 1836.

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THE BACONIAN MIND

IN

EARLY NINETEENTH CENTURY AMERICA

By

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A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
of Doctor of Philosophy in
the University of
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INTRODUCTION

The following study concerns an important aspect of the cultural development of modern society: the progressive displacement of a traditional ethos stressing man's limitations, his unity with the past, and his need for self-discipline, by what I here term (after Irving Babbitt) the Baconian doctrine of power, progress, 'natural' goodness and 'natural' freedom. In the following pages I have endeavored to trace the Baconian ideology in American thought between 1815 and the early 1840's, from the time soon after the War of 1812, when the presses of the young nation were beginning to produce substantial evidence of intellectual activity,[1]

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[1] J. G. Palfrey in the North American Review for October, 1840, remarks:

> Undoubtedly the period which measures our (North American Review's) literary life, has been one of much greater activity in America than any that had preceded it. It was divided by only one generation from the time when the American States were, as to productions of the intellect, in the helpless and sluggish condition almost inseparable from a condition of colonial dependence; and they had established their political existence at a cost, which it required the undivided attention of at least

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to the years during which the eventual triumph of the Baconian concept and orientation of life became assured.[2] I have

[Footnote 1, contd.]

> one generation to repair. The first business of the citizen, in his private walk, was to contrive to get rid of his debts, and make some provision for his family; while his less selfish thoughts were employed in watching and helping the experiment of a new government. First came great prosperity,--a uniform currency,--commercial confidence,--profitable applications of inventive talent,--vast demand for the products of an inexhaustible soil,--the carrying trade of the world. Then followed terrible reverses,--embargo,--non-intercourse,--war. The wheel of fortune was stopped with a crash, when its momentum was greatest. And it was not till after the peace of 1815, that things settled down into such a state, that a portion of the community could be spared for the laborious leisure of study, or even that individuals in active life, though of liberal tastes, could be expected to feel much inclination in themselves, or impulse from others, to the tasks of authorship.--Vol. LI, 485-486.

[2]This does not mean that the defenders of traditional beliefs were completely routed by the fourth decade of the century. The conflict, revolving mainly around education, continued long beyond the period covered here. According to Ellwood Cubberley,

> by the middle of the nineteenth century, the scientific and industrial changes had so modified the conditions of living in all progressive nations that the growing controversy between the partisans of the older classical training and the newer scientific studies as to their relative worth or importance, both for intellectual discipline and as a preparation for intelligent living, had become quite sharp.
>
> Public Education in the United States, a Study and Interpretation of American Educational History (Revised Edition, Boston and New York, 1934), p. 470.

But as a matter of fact, by that time the issue had already been decided for posterity. Of course the influence of Baconianism extended further than education; it pervaded the intellectual and emotional life of the nation generally.

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chosen this period of approximately a quarter of a century because in it Baconianism, though still at an early stage of development in American culture, had already begun to attract numerous adherents and to manifest sufficient vigor to influence education and attitudes towards literature, as it did ideas about the goal of man and how society ought to go about reaching it. And one must begin somewhere. The story would be substantially the same for later periods, into the present, with however this difference: that the cultural development here described has been more earnestly and successfully scrutinized since Irving Babbitt and other Neo-Humanists appeared at the turn of the century to condemn it.

I am, of course, heavily indebted to this Neo-Humanist criticism of modern society for the interpretation contained in the following pages. For this reason, it would perhaps be advisable to recall for the reader the nature of the concept of humanism which informs the thought of Babbitt, More and others sharing their point of view. The content here given the term humanism is general and basic. I am aware of the prevalent inconsistency in its use; of the fact that it is even employed to signify hostile points of view.[3] In my

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[3]See Irving Babbitt's examination of the term in the first chapter of Literature and the American College; also, Foerster, Humanism and America, Preface, pp. vi-vii, and C. J. Keyser, Humanism and Science, p. 49.

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own use of the term humanism, as also of the term Baconianism, I am following Babbitt and the so-called academic or Neo-Humanists. Thus employed, humanism involves more than the belief in the possibility of man's achieving the 'good life' while in the flesh; it offers a specific doctrine as to the nature of that 'good life' and the means for its attainment. It begins by postulating a basic dualism of human nature and physical nature, and in this fundamental principle all its particular tenets are rooted.[4] The humanist thus believes, on the psychological and ethical side, in the existence of standards peculiar to human life--standards that must, he believes, be preserved from the encroachment of mere physical or 'natural' forces or drives: an affirmation of what Babbitt calls the "war in the cave." Hence his insistence upon self-discipline as the only way to achieve the higher level of reality, and therewith the 'good life.' Not asceticism is the object, for all that is excessive is non-humanistic, but a balance or harmony among the various elements in human nature. Such balance ('golden mean') becomes the highest criterion of achievement in every field of human life and activity: the universal of universals. Accordingly, the humanist insists upon the existence of standards that are universal but which are repeatedly manifested in particulars--those particulars,

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[4]P. E. More, The Drift of Romanticism, pp. 247-302.

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whether in art, philosophy, political theory or religion, being great in proportion as they are informed by these universals. Thus he believes in higher and lower levels of reality. He demands that man choose the higher and that he discipline himself to live by it. The 'ethical imagination' is the faculty capable of perceiving these values and their hierarchic interrelationship. Thus we have as essential in the humanist doctrine the need for rapport of the One and the Many; that is, the need of decorum or a norm of experience which is intuited by an 'ethical imagination' guided by reason or judgment. As corollaries of this philosophical foundation the humanist affirms (a) the validity for all times of certain great creative achievements of the past, which by receiving the suffrage of successive generations prove that they are informed by universals;[5] (b) hence the value of classical studies as tending to foster a sense of decorum (not to mention their value in disciplining the mind); (c) the precedence of ideas ('higher reality') and words, as their symbols, to matter and the formulation of its laws; (d) the importance of qualitative values and imaginative insight in contradistinction to quantitative values and analysis devoted to physical data; (e) the prior need of power over self rather than power over physical nature.

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[5]More's "the church universal of the spirit." See Drift of Romanticism, p. xiv.

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The materials used in the following study comprise (1) a group of periodicals selected for their prominence as well as geographical representativeness; (2) a number of occasional addresses, many by individuals now little remembered, but at one time leaders in their communities; (3) the works of outstanding writers, educators and political figures. These sources have yielded abundant evidence of the new gospel of science and utilitarianism. They reveal the prevalence of the idea of progress and its corollary, the belief that we moderns, superior to all earlier races of men, have nothing to learn from them; that we, in the words of James Harvey Robinson, have "to create an unprecedented attitude of mind to cope with unprecedented conditions, and to utilize unprecedented knowledge."[6] They reveal further the associated belief that scientific knowledge is power--power that extends beyond physical nature into man's social relations, his intellectual life, and the very mainsprings of personality. They indicate, that is, the early presence in American thought of a monism which, on its analytical and utilitarian side may be termed scientific naturalism; on its imaginative and aesthetic side, sentimental

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[6]The Mind in the Making (New York, 1939), p. 5. The italics are Robinson's.

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naturalism.[7] They also indicate that education and literature

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[7]It is in a confined philosophical sense that the term is defined by William Ernest Hocking: "Naturalism is the type of metaphysics which takes Nature as the whole of reality. That is, it excludes whatever is supernatural or other-worldly. Whatever appears independent of natural law, such as human life or the products of imagination, is really a part of the scheme of nature: everything comes from nature and returns to nature. No doubt there is something hidden, something for which science has to search, but that hidden thing is nature itself, not anything beyond or behind nature." Types of Philosophy (New York, 1929), p. 43. But given this definition of naturalism, the representative Baconians of the period treated here would have strenuously denied (as they did upon occasion) the least suggestion of its presence in their thought. It is in a much less articulate form that naturalism appears at this time. They were naturalists, many of them, in the sense that "we are all," according to Professor R. W. Sellars, "naturalists now"--with a "common naturalism ... of a very vague and general sort, capable of covering an immense diversity of opinion. It is an admission of a direction more than a clearly formulated belief. It is less a philosophical system than a recognition of the impressive implications of the physical and the biological sciences. And, not to be outdone, psychology has swelled the chorus by pointing out the organic roots of behavior and of consciousness." Evolutionary Naturalism (Chicago, 1922), Preface, p. vii. Perhaps it would be helpful also to add a New Humanist's explanation of the naturalistic concept. "The strict Christian supernaturalist," wrote Babbitt in 1919,"had maintained that the divine can be known to man only by the outer miracle of revelation, supplemented by the inner miracle of grace. The deist maintains, on the contrary, that God reveals himself also through outer nature which he has fitted exquisitely to the needs of man, and that inwardly man may be guided aright by his unaided thoughts and feelings (according to the predominance of thought or feeling the deist is rationalistic or sentimental). Man, in short, is naturally good and nature herself is beneficent and beautiful. The deist finally pushes this harmony in God and man and nature so far that the three are practically merged. At a still more advanced stage God disappears, leaving only nature and man as a modification of nature, and the deist gives way to the pantheist who may also be either rationalistic or emotional." Rousseau and Romanticism (Boston and New York, 1919), pp. 121-122.

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were being substantially modified in accord with the new articles of faith.

It is not to be supposed that the Baconian ideas treated in the following pages were derived altogether from efforts on the part of their exponents to formulate systematically a new philosophy of life. On the contrary, they represent, to a large extent, fragmentary declarations of faith and impulsive exhortations to achievement. But they are no less significant for that. In any case, the preconceptions of an age are examined only by a very few of the millions who live by them, repeat them--and even die for them. This must be recognized in any attempt to generalize about the influence and status of ideas.

As for the ideology analyzed in the following study, I find it possible to come to these conclusions with regard to its place in the thought of the period: First, there is no question but that Americans had very generally absorbed the idea of progress before the close of the first half of the century, although all were not precisely in agreement as to the source of such progress. Some attributed it fundamentally to the power of science and technology; others attributed it to the influence of the Reformation,[8] while still others

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[8]The Reformation received approbation for 'promoting individualism' as well as for bringing a 'return to purer Christian principles.'

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credited it to the reciprocal action of Protestantism and Baconian knowledge. Most, however, did not attempt to give precedence to either; they merely pointed to 'religious enlightenment' and Promethean achievement as evidence of such progress, and did not try to analyze the grounds of their faith. Desultory instances of incredulity about the 'march of mind' were for the most part mere captiousness if not just facetiousness. Of course, there were still old-fashioned divines to remind people of sin and the sorry destiny of the human race, but such views did not reach popular periodicals and did not enter secular addresses. At best, the old-fashioned divine could expect no more than a memorial volume as a vehicle for his teachings. After all, the 'westward course of empire' was no mere abstraction. Steam engines, internal improvements and national expansion were very tangible things. Science and technology were exceedingly impressive in their results. Hence, Galileo, Newton, Davy, Franklin and Dr. Silliman became benefactors meriting the undying gratitude of the human race. Furthermore, without question it can be said that belief in man's innate goodness was being widely popularized by influential figures; nor was this an 'inert' belief, since abolitionists, politicians and educators were arguing and acting on naturalistic assumptions. Besides, men of ordinary education would doubtless have retained from the study of their school texts

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some notions of an innate 'moral sense' and perhaps a more definite concept of beneficent design in nature. It cannot be said, however, that the naturalistic implications drawn in the following pages were recognized as such by Baconians of the period. There were protests against "materialism" and "atheism" (levelled primarily against such radicals as Robert Owen and William Godwin--but they had ideas about science changing cherished mores!); and a thinker of Andrews Norton's dimensions could be aware of the monistic implications of transcendentalism.[9] But those who were the object of such censure were vehement in their denials of the charges made. American thought was still dominated by a traditional dualism, asserted even by the phrenologist. A sense of the supernatural was still present; an inherited consciousness of duality still informed sermons and energized the schoolroom switch. Nevertheless such educators as Bronson Alcott and Horace Mann were endeavoring to 'naturalize' pedagogy, and there were ministers of the gospel inspired by a sense of the power of science to control the destiny of man.

In speaking of a Baconian mind, I do not mean to suggest a mind necessarily conscious of the grounds and the various implications of its beliefs. It is enough if these

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[9]Cf. A Discourse on the Latest Form of Infidelity; Delivered at the Request of the "Association of the Alumni of the Cambridge Theological School," on the 19th of July, 1839, Cambridge, 1839.

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beliefs are entertained and asserted, whether or not their rationale is recognized--whether or not they are critically appraised or seen in historical perspective. With this qualification in mind, it can be said, in short, that in the first half of the nineteenth century, Americans were already generally conscious of progress as a palpable fact, and that they were impressed by the power of science and technology; that a large and influential body of public opinion supported the idea that man, innately good, needed only the chance to prove himself capable of unprecedented intellectual and moral elevation; and, finally, that men and women to a marked extent were demonstrating an expansive spirit--feeling that self-affirmation is a noble virtue.[10]

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[10]Admittedly these generalizations are not based on a study of every available document of the period; but it will be seen by the reader that the sources used are extensive, besides being drawn from the works of those who were leaders of public opinion: ministers, physicians, lawyers and statesmen. This evidence, selected and examined freely, reveals an unquestionable predominance of the fundamental Baconian attitudes cited. And obviously we are not dealing with mere nuances. As I have already noted, I am indebted principally to Babbitt and More for the ideological background of the study. Both have provided a frame of reference. This does not mean, however, that the material has been forced into a preconceived pattern made up of their concepts of Baconianism, Rousseauism and humanism. Actually, as it turned out, the material justified the pattern.

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Part One

Progress and Power

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CHAPTER I

Science: Faith and Fashion

When in 1818 Yale's Professor Silliman founded the American Journal of Science[1] he expressed some trepidation as to its support by the public.[2] However he might have spared himself this anxiety, for he was moving with the current of the nation's life and thought. By the time the fifth volume (1822) had appeared he could assume a more confident tone respecting the periodical's prospects; and finally with the sixth volume he was able to confide to his

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[1] The American Journal of Science, More Especially of Mineralogy, Geology, and Other Branches of Natural History; Including also Agriculture and the Ornamental as well as Useful Arts. This was not our first purely scientific journal, however. Silliman himself acknowledges the prior existence of Dr. Archibald Bruce's American Mineralogical Journal (1810-1814) which, however, ceased publication with the first volume. Am. Jour. Sc., I, 3.

[2] "Introductory Remarks," ibid., p. 4: "Even a failure in so good a cause, (unless it should arise from incapacity or unfaithfulness,) cannot be regarded as dishonourable. It may prove only that the attempt was premature, and that our country is not yet ripe for such an undertaking."

Ibid., p. 440: "In the commencement of an enterprise, for the first time attempted in this country, an enterprise arduous in its nature and uncertain in its issue, it will not be doubted that considerable solicitude was experienced."

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readers that the Journal's success was assured.[3] American science may have been in its childhood when Silliman assumed its guardianship,[4] but it was none the less in a lusty and active childhood. Medical journals were devoting

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[3]The second, third and fourth volumes all contain expressions of solicitude regarding patronage and expenses. But when the preface of volume five was being written Silliman could state "A trial of four years has decided the point, that the American Public will support this Journal." And in volume six (p. iii) his patrons were informed that the journal "is now sustained by actual payment, to such an extent, that it may fairly be considered as an established work."

The Southern Literary Messenger in 1835 added its sigh of relief, indicating thereby the concern of other parts of the nation in the welfare of American scientific endeavor. Wrote the Messenger:

> We are glad to see that this admirable Journal is no longer in immediate danger of decline. It is the only work of the kind in the United States, and it would be positively disgraceful to let it perish from a want of that patronage which, in the opinion of all proper judges, it so pre-eminently deserves. We perceive a suggestion in the New York American on the subject--an appeal to the lovers of sound knowledge, calling upon them for their aid in behalf of the Journal, and urging them not to let slip any opportunity of speaking a word in its favor. To this appeal we take pleasure in cordially responding. We positively can call to mind, at this moment, no work whatever, more richly deserving of support; and it must be supported, if only for the justice of the thing--it will be supported, we believe, for the credit of the country. (I, 714.)

[4]"Of him it has been truly said that he was the guardian of American Science from its childhood." Edward S. Dana, et al., A Century of Science in America with Special Reference to the American Journal of Science, 1818-1918 (Yale University Press, 1918), p. 67.

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substantial attention to all branches of science,[5] and periodicals for the general reader, even those concerned primarily with "polite literature," were carrying, along with their "literary intelligence," articles on the physical sciences and their application.[6] Moreover, Baconian societies formed since Franklin had established the American Philosophical Society in 1743 were publishing the fruits of their members' exertions in journals, transactions and memoirs.[7]

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[5]The Medical Repository of New York, founded in 1799, was the "first scientific journal in America." It was edited by S. L. Mitchill, professor of chemistry at Columbia. Philadelphia alone 'produced about a dozen medical journals between 1795 and 1825, most of them largely eclectic.' Frank L. Mott, A History of American Magazines 1741-1850 (New York and London, 1930), pp. 149, 151.

[6]Cf. ibid., pp. 61-62, 82, 90-91, 149-154. Silliman, in launching the Journal, takes cognizance of the presence of scientific contributions in general periodicals, but considers these inadequate media. "Introductory Remarks," I, 2-3. The initial volume of the United States Literary Gazette (1824) may be taken as representative of the custom of including scientific and technological subjects in periodicals of a general literary character. Besides four medical and general scientific reviews, this volume contained under the headings "Intelligence" and "Miscellaneous" some 71 items, out of a total of 149, on topics related to science and invention. This was the same year that the Atlantic Magazine appeared with an introductory recipe for producing a journal--in the form of a dialogue between publisher and editor, wherein both agree as to the acceptability of scientific contributions:

> Pub.--You will also occasionally insert scientific communications.
>
> Ed.--If we can get them: they will make good ballast.
>
> I (1824), 6.

[7]The American Philosophical Society, founded in 1743, was but the first of several important American scientific

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In the dozen years following the establishment of Silliman's Journal the scientific and "improving" spirit of the age became manifest in the growth of mechanics' institutions[8] and in the remarkable development of the lyceum movement. The American Journal of Education announced in

[Footnote 7, contd.]
societies. In the years following there were also instituted the American Academy of Arts and Sciences (Boston, 1780), the Connecticut Academy of Arts and Sciences (New Haven, 1799), the Academy of Natural Sciences (Philadelphia, 1812), the Linnæan Society of New England (Boston, 1814), later (1830) the Boston Society of Natural History, the New York Lyceum of Natural History (1817), the New York Horticultural Society (1818). To these could be added many local agricultural societies, among the earliest associations in America dedicated to the promotion of scientific knowledge.

[8]The Franklin Institute of Philadelphia was founded in 1824 with a membership of 560; in 1826 its members numbered 1,065. Franklin Journal, I (1826), 3. The Boston Mechanics' Institution was formed in 1827. Additional "institutions for the scientific instruction of mechanics and others" were at that time "in operation in Baltimore, New York, Rochester, and Waltham." George B. Emerson, An Address, Delivered at the Opening of the Boston Mechanics' Institution, February 7, 1827 (Boston, 1827), p. 7n. The Massachusetts Charitable Mechanic Association was instituted as early as 1795 "for mutual aid in the advancement of the mechanic arts," as well as for benevolent purposes. American Journal of Education, IV (1829), 65-68. The New York Mechanic and Scientific Institution was deemed important enough to be favored with a request for legislative support in Governor Clinton's message of 1825 to the New York State legislature. State of New York. Messages from the Governors, ed. Charles Z. Lincoln (Albany, 1909), III (1823-1842), 66. An indication of the prevalent interest in mechanics' institutions and belief in their great educational value is supplied by an article on the rise and significance of these institutions in England, which was carried in the AJE, I (1826), 134-144. See also "Observations on the Rise and Progress of the Franklin Institute," Franklin Journal, I (1826), 66-71, 129-134.

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1828 that between fifty and sixty societies on the lyceum plan had already[9] been formed, and that the idea was spreading rapidly over New England; whereupon the Journal ventures to hope that lyceums will be introduced into other sections of the country,

> that every town and village in New England, at least, will take the subject into early and serious consideration, to determine whether they cannot ... participate in spirit, and engage in the exercises, that they may enjoy the benefits of an institution designed for the diffusion of knowledge and the benefit of the world.[10]

In 1830 the same journal could boast:

> Branches of the lyceum are now organized in nearly every state in the Union, and a deep and general interest manifested upon the subject in every portion of the country, particularly at the south. Several counties in Kentucky have organized lyceums, and upon a plan which is intended to embrace the State.[11]

It was estimated in 1832 that there were "nearly a thousand

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[9]The first one had been established only two years before. Cf. "Lyceums," American Journal of Education (hereinafter abbreviated AJE), V (1830), 2; "American Lyceum," American Annals of Education, II (1832), 36.

[10]"American Lyceum," AJE, III (1828), 628-633. This publication acted as the official organ of the lyceum movement and devoted a relatively large amount of space to it. Articles and notices thereon appeared in the same volume, pp. 497-505, 701-704, 715-721, 722-732, 746-750, 753-758; in IV, 40-53, 337-342; in V, 1-6. The American Annals of Education, succeeding to the AJE in 1831, under the editorship of William C. Woodbridge, continued to record the aims and activities of the 'American Lyceum.'

[11]V, 2. Cf. also "Education in Kentucky," AJE, IV (1829), 543-547.

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of these institutions in the United States," and that in Massachusetts alone their membership amounted to about 5,500.[12]

Through its lectures and mutual instruction the lyceum was becoming an important instrument of popular education, and was being recognized as such.[13] "The lyceum begins where the school ends," declared Robert Rantoul, Jr.; it "is a mental gymnasium."[14] Samuel Read Hall, in the first professional teacher's manual published in America[15] (1829), urged that instructors of youth "form Lyceums in every place where they may be employed in teaching."[16] The lyceum was a church for Ralph Waldo Emerson after he had left the ministry. "My pulpit is the Lyceum platform," he once declared:[17]

> Here is a pulpit that makes other pulpits tame and ineffectual--with their cold, mechanical preparation for a delivery the most decorous,--

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[12] American Annals of Education, II (1832), 41.

[13] [Josiah Holbrook,] The American Lyceum, or Society for the Improvement of Schools and Diffusion of Useful Knowledge, Boston, 1829; reprinted in Old South Leaflets, vol. VI, No. 139 (Boston, n.d.), pp. 293-312. Cf. also AJE, III (1828), 628-633.

[14] Memoirs, Speeches and Writings, ed. L. Hamilton (Boston and Cleveland, 1854), pp. 130-131.

[15] Cubberley, Public Education in the United States, p. 325.

[16] Lectures on School-Keeping (Boston, 1829), p. 115.

[17] [J. Holbrook], op. cit. (Old South Leaflets reprint), p. 293.

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> fine things, pretty things, wise things, but no arrows, no axes, no nectar, no growling, no transpiercing, no loving, no enchantment.[18]

Here, however, according to Emerson, the speaker

> may lay himself out utterly, large, enormous, prodigal, on the subject of the hour. Here he may dare to hope for ecstasy and eloquence.[19]

Here also, one might add, the speaker was in connection with an institution performing a very significant function in the development of American education; for it was serving as a means of propagating new educational ideas.[20]

Although the diffusion of general culture, the promotion of knowledge in all its branches, was the express aim of the lyceum, it was given an unmistakably Baconian bias from the outset.[21] "It proposes," explained a spokesman for

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[18] Journals (Boston and New York, 1911), V, 281.

[19] Loc. cit.

[20] C. B. Hayes, The American Lyceum, Its History and Contribution to Education, U.S. Department of Interior, Bulletin No. 12 (1932), U.S. Government Printing Office, 1932.

[21] Josiah Holbrook, "to whose exertions chiefly the Lyceum owes its origin" (AJE, IV, 53), is quoted as stating in 1828 that the "immediate effect" of branches of the lyceum "had uniformly been, to awaken a spirit of inquiry among all classes of the community, in relation to important subjects in agriculture, mechanics, and the parts of natural philosophy and other useful sciences, which admit of practical application to the business of those engaged in these useful pursuits." AJE, III (1828), 753. See also "Results of Lyceums," American Annals of Education, I (1831), 526-529, and "American Lyceum," ibid., II (1832), 35-42.

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the movement in Boston, "to afford assistance, not so much in literature, as in the exact sciences, and their application to the useful arts and the business of life."[22] Which, in his opinion, is as it should be: Indeed, it is "adapted to the genius of our population," precisely because of "its practical bearing" as well as "its moral influence" and "simplicity."[23] It was apprehension of this very "practical bearing" that elicited the remonstrance of Mr. Nehemiah Cleaveland, preceptor of one of New England's very respectable academies,[24] who complained before the American Institute of Instruction that aims were being ascribed to the lyceum "which seemed to recognize the

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[22]The Reverend Rand, quoted in AJE, III (1828), 747.

[23]Ibid., 748-749.

The Journal of Education did not hesitate to connect the lyceum with "the dissemination of useful knowledge, and the application of science to the practical pursuits of life." IV, 1-2, 40-53. In 1831 the assembled members of the American Institute of Instruction were told by Stephen C. Phillips of Salem that the lyceum could and should help satisfy the educational needs and implement the aims of 'this free nation in the vanguard of an advancing world.' In a society where opportunity in the workaday world is open to all, he argued, everyone is expected to take part in useful endeavor. And it is to such a community that "the lyceum seeks to adapt itself," and in which it performs a necessary educational function; for it is democratic and it conveys useful learning. "On the Usefulness of Lyceums," American Institute of Instruction Lectures, 1831, pp. 65-102.

[24]Dummer Academy, Newbury, Mass.

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importance of no science, but that which relates to matter."[25] A writer for the New England Magazine charged that "one of the greatest evils of the Lyceum System has been, that science, subjects involving facts, experiments, and demonstrations, have been attended to almost exclusively"--but, "from the very nature of the case."[26] And Frederic Henry Hedge is also critical of this practical bias, but out of regard for higher values that he sees in scientific knowledge itself. Alluding to the lyceum, in a contribution to the Christian Examiner[27] (1834), he remarks:

> The sentiment which this institution expresses is respect for knowledge, but it is a kind of respect by no means adequate to its object at this late date. It is a respect for the results of knowledge rather than for knowledge itself. It is the applicability to the practical purposes of life, rather than the inherent, essential worth, which our people prize. Practical utility is, doubtless, an important consideration; but, if mankind had never soared

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[25]"On Lyceums and Societies for the Diffusion of Useful Knowledge," in The Introductory Discourse and Lectures Delivered in Boston, before the Convention of Teachers, and Other Friends of Education, Assembled to Form the American Institute of Instruction, August 1830 (Boston, 1831), p. 155.

[26]"The Prospects of Poetry and Science," V (1833), 496.

[27]"The Christian Examiner is one of the most important of American religious reviews not alone because of its exposition of the Unitarian point of view in theology throughout more than half a century, but because of its distinctive work in literary criticism, and its comment on social, philosophical, and educational problems." Frank L. Mott, A History of American Magazines 1741-1850, pp. 284-285.

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> beyond the idea of practical utility, no science would ever have advanced beyond its first rudiments, and, consequently, the world would never have been blessed with those results which we prize so highly.[28]

The aim of mechanics' institutions was, of course, avowedly Baconian: the general scientific education of workingmen. The opening of the Boston Mechanics' Institution in 1827 was an occasion for solemn dedication of the efforts of modern man. It signalized, according to the speaker of the evening who had helped to found it, the "new era in the history of science and the mechanic arts."[29]

> We are this night assembled to open an Institution whose object is to throw upon the business and labours of common life the light of reason and philosophy.[30]

'Was there anyone who could remain unmoved at such a scene?'

> We cannot look on, without a deep and joyful feeling, at the prospect which is opening before us. Thousands, at this hour, are listening to the lessons of philosophy, which come home to their own 'business and bosoms.' The gates of the temple of science, closed as with adamant, since the beginning of time, against all but a favored few, are thrown wide open, and multitudes from the workshops and fields, from the mine, the forest, and the ocean, from every region of labour and action, are hastening up

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[28] "Everett's Phi Beta Kappa Address," XVI, 17-19.

[29] G. B. Emerson, op. cit., p. 1.

[30] Loc. cit.

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> thither to partake and rejoice in the waters of intellectual life.[31]

Mr. George B. Emerson was hardly exaggerating here the public's interest in scientific lectures. The appeal of the sensational may perhaps explain the drawing power of lectures on phrenology, but ladies and gentlemen, and many a youngster whose intellectual progress was the object of parental solicitude,[32] flocked also to sober talks on

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[31] Ibid., p. 15.

Daniel Webster, speaking before the Boston Mechanics' Institute in 1828, described its object thus:

> The distinct purpose is to connect science more and more with art; to teach the established, and invent new, modes of combining skill with strength; to bring the power of the human understanding in aid of the physical powers of the human frame; to facilitate the coöperation of the mind with the hand; to promote convenience, lighten labor, and mitigate toil, by stretching the dominion of mind farther and farther over the elements of nature, and by making those elements themselves submit to human rule, follow human bidding, and work together for human happiness.
>
> Writings and Speeches, National Edition (Boston, 1903), II, 27.

Webster saw mechanics' institutes as agencies of social progress, because he had faith in the power of science and technology to advance mankind. See the following chapter.

[32] At one time this became a source of concern to the Franklin Institute officials. In 1827 the Board of Managers noted:

> At the commencement of the lecturing season, the courses were all very well attended, but as they proceeded, much inconvenience was

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chemistry, mechanics, electricity or "the natural history of the earth and of man." The epidemic of lyceum and mechanics' association lectures ranged over subjects from honey bees to railroads.[33] Between 1817 and 1824 Amos Eaton was making "converts to the cause of natural science" by

[Footnote 32, contd.]

> experienced from the indecorous conduct of a considerable number of boys, whose only object in attending must have been amusement, as many of them were wholly disinclined, and others too young, to derive benefit from the lectures. Owing to this circumstance, a large proportion of the senior members declined attending, as the courses advanced. The Board have been extremely desirous of extending to the younger classes of the community, the advantages offered by the lectures delivered in the Institute; but after fairly trying the experiment, they will find themselves compelled to restrict their attendance, within much narrower bounds than heretofore. Franklin Journal, III (1827), 423.

To control this situation the Board of Managers in the following report issued regulations whereby youths under sixteen were permitted to attend only when accompanied by a parent or guardian, and those over sixteen only if their age had been certified by parent or guardian and if they were seated by the time lectures began. Ibid., IV (1827), 124.

[33]There was Dr. Gay's lecture before the Plymouth Lyceum on the honey bee (AJE, IV, 178), and William Jackson's lecture on railroads delivered the same year (1829) before the Massachusetts Charitable Mechanics' Association (published that year in Boston under the title, Lecture on Rail Roads). The American Journal of Education (IV, 90) expressed the hope that "this instructive discourse" would "be perused at every lyceum in this [Massachusetts] and the neighbouring states." It is interesting to note that the Albany Medical College opened its doors in 1839 with the announcement of "a radical innovation": an invitation to the general public to attend its courses, issued in the hope that this might encourage "the non-professional laity to cultivate at least the rudiments

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his lectures in New England and New York.[34] Even Cincinnati, as early as 1818, had its lectures on botany.[35] The whole gamut of the sciences was offered Philadelphians by the Franklin Institute.[36] Mineralogical lectures, so New York's science enthusiast, Mr. DeKay, informs us in 1826, "are delivered in every considerable town in the Union, and extensive cabinets of minerals are to be met with in every direction."[37] This same year saw the inauguration under the sponsorship of the New York Mercantile Library Association of a course of scientific lectures which was to become so popular that it was "found impossible to accommodate the

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[Footnote 33, contd.]

of the physical sciences." D. M. Reese, Introductory Lecture before the Albany Medical College, Delivered October 1, 1839 (Albany, 1839), p. 5. A series of lectures on electricity was given at the New York Athenæum in 1827 by Professor James Freeman Dana of Columbia. S. F. B. Morse, Letters and Journals, ed. E. L. Morse (Boston and New York, 1914), I, 290.

[34]E. M. McAllister, Amos Eaton, Scientist and Educator, 1776-1842 (University of Pennsylvania Press, 1941), p. 180.

[35]Port Folio, XXI (1819), 79.

[36]Franklin Institute and American Mechanics' Magazine, I (1826), 3-4; III (1827), 423. The lectures sponsored by the Franklin Institute were regularly reported in the Franklin Institute Magazine. Notice of these lectures is also carried by the AJE, II (1827), 377-378. Note that both journals first appeared in the same year.

[37]J. E. DeKay, Anniversary Address on the Progress of the Natural Sciences in the United States: Delivered before the Lyceum of Natural History, of New York, Feb. 1826 (New York, 1826), p. 11.

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public demand for admission," the Association being "reluctantly" forced to restrict attendance to members.[38]

We may well assume that this popularity was enhanced by the appearance of Dr. John Griscom on the Association's program--the well-known Dr. Griscom who had begun lecturing to New Yorkers as early as 1807.[39] For years his lectures were one of the city's attractions. When in 1817 the old almshouse was given over to the use of learned societies, and Griscom with other scientific gentlemen continued their educational activities there, the Knickerbocker versifier, Halleck, digressed from the central theme of his Fanny long enough

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[38]J. H. Gourlie, An Address, Delivered before the Mercantile Library Association, at Its Eighteenth Annual Meeting, January 8, 1839 (New York, 1839), p. 9.

[39]Dr. Griscom was engaged by the Mercantile Library Association for lectures in chemistry and natural philosophy in 1829, 1830 and 1831. In 1843 this veteran of the platform was still lecturing--on chemistry before the Lyceum Company of Salem, New Jersey. J. H. Griscom, Memoir of John Griscom, LL.D. (New York, 1859), pp. 324, 334. Dr. Griscom was agreeably impressed by the prevalence of such lectures in Great Britain. He writes in a letter from England (March 4, 1819) that

> there is scarcely a town of considerable note, in Great Britain, which is not sometimes visited by ... travelling lecturers, who, by means of portable apparatus, and a facility in communicating instruction, impart the benefits of useful knowledge to hundreds and thousands who might otherwise remain destitute of its advantages.

A Year in Europe (New York, 1823), II, 299-300.

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To bless the hour the Corporation took it
Into their heads to give the rich in brains,
The worn-out mansion of the poor in pocket,
Once 'the old almshouse,' now a school of wisdom,
Sacred to Scudder's shells and Dr. Griscom.[40]

Our heroine, herself, in pursuit of the fashionable polish that may brighten a young lady's matrimonial chances

... was among the first and warmest patrons
Of Griscom's conversaziones, where
In rainbow groups, our bright-eyed maids and matrons,
On science bent, assemble; to prepare
Themselves for acting well, in life, their part
As wives and mothers. There she learned by heart

Words to the witches in Macbeth unknown.
Hydraulics, hydrostatics, and pneumatics,
Dioptrics, optics, katoptrics, carbon,
Chlorine, and iodine, and aërostatics;
Also,--why frogs, for want of air, expire;
And how to set the Tappan sea on fire![41]

As for Boston--that self-consciously dedicated Athens of America was early showing the appetency for lectures which long attachment to pulpit discourse had apparently cultivated. The year that Dr. Griscom opened his lecture series

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[40] Poetical Works (second edition, New York, 1848), p. 147.

[41] Ibid., pp. 178-179.

Nor should we forget the parson's daughters in Washington Irving's "Buckthorne"--the young ladies who, among their other accomplishments

knew something of geology and mineralogy; and went about the neighborhood knocking stones to pieces, to the great admiration and perplexity of the country folk.

Tales of a Traveller (New York, 1851), p. 196.

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in New York, we find the Monthly Anthology reporting the availability of the Boston Athenaeum's laboratory and apparatus "for the purpose of lectures on chemistry, natural philosophy, and astronomy." No justification was deemed necessary for such a gesture:

> The usefulness of a course of popular instruction upon these and other related subjects, calculated to interest the young of both sexes, and to diffuse as well as extend the knowledge of the laws and operations of matter, need not be displayed.[42]

The Boston Society for the Diffusion of Useful Knowledge, established in 1829 on the lyceum plan, proposed immediately to offer lectures in natural science as well as other practical subjects.[43] In the very first issue of his American Journal of Education (1826) Boston's energetic educator and promoter of the lyceum movement, William Russell, undertook to encourage popular lectures "as a branch of adult education which may be rendered very conducive to the dissemination of knowledge."[44] Accordingly the Journal was happy to announce a series of lectures "by Drs. Ware and Bradford of this city" at the Pantheon Hall "on the physiology and

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[42] IV (1807), 230. See also Josiah Quincy, History of the Boston Athenaeum (Cambridge, 1851), p. 46, for evidence of that institution's early interest in lectures on natural history.

[43] AJE, IV (1829), 176-178.

[44] P. 61.

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natural history of man."

> The following are among the topics which these gentlemen have selected: food, digestion, circulation, respiration, structure of the eye, of the ear, voice, speech, the senses, the brain, sleep, &c.[45]

And out of Concord in the 30's came Ralph Waldo Emerson to deliver those first lectures of his--lectures manifesting a deep interest in natural science, enforcing his central theme that the miracle of the universe is a great spiritual lesson. Bostonians heard him at the Society of Natural History, at the Athenæum and at the city's Masonic Temple on such subjects as "The Naturalist," "The Humanity of Science," "The Relation of Man to the Globe," "The Uses of Natural History."[46] Further demonstrating the prevailing desire to extend scientific knowledge through lectures, John Lowell, Junior, left $250,000 "for the establishment of regular courses of public lectures, upon the most important branches of natural and moral science, to be annually delivered in the city of Boston." The first course was offered in 1840 by the founder of the American Journal of Science, who invited the public to enter the arcana of the science of geology.[47] In this same year the renowned Lyell delivered

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[45]Loc. cit.

[46]J. E. Cabot, A Memoir of Ralph Waldo Emerson (Boston and New York, 1888), I, 222-223; II, 710-732.

[47]Edward Everett, "John Lowell, Jun., Founder of the Lowell Institute," in Orations and Speeches on Various Occasions (second edition, Boston, 1850), II, 379.

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his lectures on geology "in the principal Cities of the Union."[48] And in the following year the English divine and scientist, Dionysius Lardner, arrived in this country to begin an extensive lecture tour during which he spread the Baconian gospel as well as facts about comets, electricity, navigation and the properties of light and sound.[49] In printed form his lectures reached twelve editions by 1850.[50]

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[48]Cf. Charles Lyell, Lectures on Geology, Delivered at the Broadway Tabernacle, in the City of New-York, second edition, New York, 1843 ("Reported for 'The New-York Tribune'").

[49]This tour lasted until 1844.

[50]Popular Lectures on Science and Art; Delivered in the Principal Cities and Towns of the United States, twelfth edition, New York, 1850, 2 vols.

Lardner's course of lectures was reported for the New York Tribune and originally published in pamphlet form, three editions being issued by 1843. The advertisement to the first edition tells us:

> Dr. Lardner's Course of Scientific Lectures in the city of New York, was delivered at Niblo's Saloon in December, 1841, to large and highly intelligent audiences, who manifested profound gratification at the ability with which his subjects were treated and the clearness with which they were elucidated. It consists of Eight Double Lectures of two hours each, in which the nature and relations of the SUN, the COMETS, the FIXED STARS; ELECTRICITY; the character and properties of LIGHT and SOUND, with the structure of the organism adapted to their perception; a comparison of BRITISH AND AMERICAN STEAM NAVIGATION, &c. &c. were thoroughly elucidated. These Lectures were regularly reported for 'the New York Tribune' by H. J. Raymond, Esq. Assistant Editor of that paper, with a fidelity and ability which elicited the warm commendations of the Lecturer, as well as of the Public. From that paper they are reprinted, with corrections, in the Pamphlet herewith submitted, as a humble but not entirely valueless contribution to the cause of Popular Science.
>
> (Quoted from 1843 edition, New York.)

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Scientific publications were issuing from the American press in increasing numbers during this period.[51] And it became something for speakers to note with patriotic pride that among them the work of Americans was well represented. We might, admittedly, be inferior in "polite literature," but no one could with justice derogate our contribution to science and its application. "Who reads an American book" could here be said only by the malicious. America is no nation of mere "hewers of wood and drawers of water," declared the president of the New England Linnæan Society at its first anniversary meeting (1815), but a nation that has shown laudable enterprise in "the essential rudiments of education, useful arts, commerce, agriculture, military and naval skill."[52] Dr. Jacob Bigelow in his inaugural address as Rumford professor at Harvard adverted with pride to America's utilitarian "fruits of silent efficiency and perseverance," achieved despite severe limitations.[53] Europe

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[51]This may be readily seen by comparing the number of such works listed in the 1815, 1830 and 1840 issues of the North American Review.

[52]J. Davis, "An Address to the Linnæan Society of New England, at Their First Anniversary Meeting, at the Boston Athenæum, June 14th, 1815," North American Review, I (1815), 320.

[53]Ibid., IV (1817), 275. The address was delivered December, 1816. The professorship was established by Count Rumford for lectures on the application of science to the arts.

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may transcend us in literature of the imagination, in the opinion of Charles Jared Ingersoll, but as for "the literature of fact, of education, of politics, and perhaps even science, European pre-eminence is by no means decided."[54] And Henry Wheaton, speaking at the opening of the New York Athenæum (1824) is willing to admit our deficiency in "those arts which adorn and embellish human life," but insists nevertheless that our contributions to scientific as well as political and theological literature are worthy of high esteem.[55] According to DeKay it "is too obvious to be denied," and, indeed, a matter of commendation, that America has made progress "in those departments of knowledge which are more immediately connected with the wants of society."[56] Dr. DeKay's very good friend, Mr. James Fenimore Cooper, ventured the opinion in his Notions of the Americans (1828) that America may be expected to achieve its greatest triumphs in "science and the useful arts":

> Although there are so many reasons why an imaginative literature should not be speedily created in this country, there is none, but that

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[54] A Discourse Concerning the Influence of America on the Mind (Philadelphia, 1823), pp. 13-14.

[55] An Address, Pronounced at the Opening of the New-York Athenæum, December 14, 1824 (second edition, New York, 1825), pp. 9-11.

[56] Op. cit., p. 5. DeKay, an official of the New York Lyceum of Natural History, was himself to contribute to Baconian progress an almost eight-year labor: his Zoology of New York in five volumes (1842-1844).

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> general activity of employment which is not favourable to study, why science and all the useful arts should not be cultivated here, perhaps, more than any where else. Great attention is already paid to the latter. Though there is scarce such a thing as a capital picture in this whole country, I have seen more beautiful, graceful, and convenient ploughs in positive use here, than are probably to be found in the whole of Europe united. In this single fact may be traced the history of the character of the people, and the germ of their future greatness.

And as for scientific knowledge,

> it is probable that the amount ... in the United States, at this day, compared to what it was even fifteen years ago, and without reference to the increase of the population, is as five to one, or even in a still much greater proportion. Like all other learning, it is greatly on the advance.[57]

More than a decade before this, in 1816, a contributor to the North American Review had observed that chemistry "now attracts" not only "philosophers" but also "ladies, men of the world, all, in short, who pretend to a smattering in letters."[58]

In response to this interest the nation was increasing markedly its native contributions to science;[59] periodicals

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[57]London edition, II, 151-153. Apparently the idea that Americans are peculiarly gifted in this direction had an early development. Cf. also Samuel L. Knapp, An Oration, Pronounced before the Society of Phi Beta Kappa at Dartmouth College, August 19, 1824 (Boston, 1824), p. 13; also the North American Review, XIV (1822), 418-419; New England Magazine, III (1832), 305.

[58]III, 79.

[59]Earlier there had been the pioneer contributions of Franklin and Jefferson, of Bartram, the Peales, Philadelphia's

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reviewed them with unflagging enthusiasm,[60] and orators pointed to them with pride as evidence of America's rôle in the "march of mind."[61] Edward Everett envisioned a whole nation at work preparing fertile soil for the growth of science:

> There is not a mind, of the hundreds of thousands in our community, that is not capable of making large progress in useful knowledge; and no one can presume to tell or limit the number of those who are gifted with all the talent

[Footnote 59, contd.]

noted Dr. Rush and Samuel Mitchill. They were followed by an extensive brotherhood in scientific investigation, that produced a number of publications, some exceedingly ambitious, among which these are the more prominent only: Maclure's Observations on the Geology of the United States (1809, 1817), Bigelow's Collection of the Plants of Boston and Environs (1814) and American Medical Botany (1817), Cleaveland's Elementary Treatise on Mineralogy and Geology (1816), Nuttall's Genera of North American Plants (1818) and Manual of Ornithology of the United States (1832-34). There were the works also of two of Silliman's outstanding pupils: Amos Eaton's Manual of Botany for North America (1817) and his Index to the Geology of the Northern States (1818), James Dwight Dana's Outlines of the Mineralogy and Geology of Boston (1818) and System of Mineralogy (1837). The works in the field of zoology by Wilson, Say, Audubon and the expatriate Charles Lucien Bonaparte were given enthusiastic reception by the reviewers. See following note. For summaries made during this period of the development of scientific activity in the United States before 1850, see J. E. DeKay, op. cit.; S. Dana et al., op. cit.; S. L. Mitchill, A Discourse on the Character and Services of Thomas Jefferson, More Especially as a Promoter of Natural and Physical Science, Pronounced by Request before the New-York Lyceum of Natural History, on the 11th of October, 1826, New York, 1826.

[60] See Appendix I, p. i.

[61] Cf. addresses as quoted hereinafter, or cited in connection with science and the 'march of mind.'

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> required for the noblest discoveries. They have naturally all the senses and all the faculties--I do not say in as high a degree, but who shall say in no degree?--possessed by Newton, or Franklin, or Fulton. It is but a little which is wanted to awaken every one of those minds to the conscious possession and the active exercise of its wonderful powers.[62]

It is Dr. Griscom's belief that

> the first quarter of the present century has, upon the whole, been the most brilliant and fertile era which has ever shone upon the history of science; and the age in which we live is enriched beyond all calculation, with the fruits of its genius.[63]

Almost a missionary zeal characterized the numerous efforts to popularize this accumulating data of science and its practical application. Speakers enjoined their audiences, in reiteration of Edward Everett's sentiments, not to ignore the lesson taught by the history of human progress, that

> for want of a diffusion of scientific knowledge among practical men, great evils have resulted both to science and practice.[64]

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[62]"On the Importance of Scientific Knowledge to Practical Men, and on the Encouragements to Its Pursuit" (being 'the substance of addresses delivered by the author at the opening of the Mechanics' Institute in Boston, 1827; before the Middlesex County Lyceum at Concord, 1829; and before the Columbian Institute, Washington, 1830'), Orations, I, 281. Note that this essay was also published in the first volume of the American Library of Useful Knowledge.

[63]Quoted in J. H. Griscom, op. cit., p. 329.

[64]"On the Importance of Scientific Knowledge," in Orations, I, 247.

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The lesson was evidently not being ignored. "It is indeed one of the peculiar and great undertakings of the age," wrote the Reverend Orville Dewey in the North American (1830), "to communicate scientific knowledge to the whole intelligent portion of the mass of society."[65] It was an age diligent in the forming of "cabinets of natural history" and in augmenting facilities for scientific reading.[66] It

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[65] XXX, 295.

[66] The Boston Athenæum's 'repository of models' and 'museum' are noted as early as 1807 in the Monthly Anthology, IV, 230. In that year the Athenæum purchased for $1,000 the apparatus of the Society for Promoting Philosophical Knowledge. In 1812 it accepted the offer of Obadiah Rich to deposit his "considerable collection of objects in the department of natural history" with the Athenæum, and "to give his personal attention to the formation of a Cabinet of Natural History." The library of scientific books was also growing. In 1807 and succeeding years its library of scientific books was considerably enlarged by merger or purchase. In 1826 it received the subscription raised by the Boston Scientific Association's Library for the purchase of scientific books. Another sum subscribed that year was "for completing the transactions of the Royal Societies and Academies of Sciences in London, Edinburgh, Dublin, Paris, Petersburg, Berlin, Turin, Göttingen, Stockholm, Copenhagen, Madrid, and Lisbon, making, in the whole, one of the most complete scientific libraries in the United States." Josiah Quincy, op. cit., pp. 45-47, 56, 94-103; see also "Boston Scientific Library," AJE, I (1826), 180-182.

The colleges and Baconian societies all had, of course, their collections. Even the New York Historical Society established a 'cabinet of natural history' in 1816. D. Hosack, Inaugural Address, Delivered before the New-York Historical Society (New York, 1820), p. 12. The Gibbs collection of mineralogical specimens at Yale, according to Benjamin Silliman, could stand comparison with any cabinet in Europe. "Introductory Remarks," American Journal of Science, I (1826),

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was an age of "libraries of useful information" and of "libraries of scientific knowledge."[67] It was an age of

[Footnote 66, contd.]

p. 6. The North American, having noted the efforts of Bostonians (as mentioned above) to secure a more complete library of scientific books, adds the information that "cabinets of minerals are becoming more common and extensive, throughout the United States," and that "an attempt is now making in this vicinity to establish a museum of comparative anatomy." XXIII (1826), 206. Charles Willson Peale's pioneer efforts did not want for imitation. One cannot read far in the periodical literature of the early nineteenth century without encountering a considerable number of allusions to, and descriptions of, 'cabinets' and 'museums.' The settling West was not far behind in these exertions. As early as 1827 Cincinnati could boast of two museums, the inventories of which are not without interest. We are told by Timothy Flint that Dorfeuille's Western Museum contains

> 100 mammoth and arctic elephant bones; 50 bones of the megalonix [sic]; 33 quadrupeds; 500 birds; 200 fishes; 5,000 invertebral animals; 1,000 fossils; 3500 minerals; 325 botanical specimens,

as well as medals and coins, specimens of Egyptian and American antiquities, "the Tattooed head of a New Zealand chief; together with about 500 specimens of miscellaneous curiosities." We are further told that lectures "illustrative of the various articles in the museum" have been given. Letton's Cincinnati Museum, established in 1818, according to the same informant, contained

> 200 birds, 40 animals, 2000 minerals, 50 mammoth bones, 23 wax figures, besides a variety of Indian antiquities, marine shells, and miscellaneous articles.

"Cincinnati in 1826," Western Monthly Review, I, 64-65.

[67]The New York publishing firm of Carvill became in 1827 the American agent for the English series, Library of Useful Knowledge, which the American Journal of Education for that year praised for its practical bearing and recommended to mechanics' institutions (II, 503-507). There soon appeared this country's imitation: the American Library of

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"conversation books" and "juvenile philosophers,"[68] designed to lure unsuspecting children into learning the principles of hydrostatics or the mode of a steam-engine's operation.[69] It was, in short, an age that carried on and augmented modern

[Footnote 67, contd.]

Useful Knowledge, issued "by authority of the Boston Society for the Diffusion of Useful Knowledge." The first volume (1831) contained several essays and discourses expounding the significance of science, and also included the first part of Lord Brougham's "Account of Lord Bacon's Novum Organon Scientiarum"; the second volume (1831) consisted of a reprint of the English work by Henry Kater and Dionysius Lardner, A Treatise on Mechanics, and the fourth volume (1832) contained the latter's "Treatise on Hydrostatics and Pneumatics" with the second part of Brougham's "Account of the Novum Organon." Besides many another Baconian item, Harper's Family Library included the Kater and Lardner treatise in mechanics (1832) as well as the latter's The Steam Engine Familiarly Explained and Illustrated (1836). There was also a Working Man's Library appearing in the thirties, not to mention a School Library (volumes XI and XII comprising a revised version of Bigelow's Elements of Technology under the title The Useful Arts), a Naturalist Library and Cabinet of Nature and Philosophy. The editors of these 'libraries' were strongly convinced of the bond between morality, piety and 'useful knowledge.'

[68] At least two 'Juvenile Philosophers' were published in this country, one at Boston and another at Geneva, New York. AJE, I (1826), 636; III (1828), 192. The 'Rollo books' and 'Peter Parley' series were probably the most famous of the juvenile works of this character.

[69] But which too often succeeded merely in being irrepressibly pedantic. A "conversation" child in, let us say, a garden was not permitted to make the simplest comment about a plant without being overwhelmed by a barrage of data. "What a delightful smell of musk!" exclaimed Henrietta, one of these unfortunate children. And promptly from the adult world: "That is the mimulus moschatus, which affords, I believe, the strongest instance of musk in the vegetable kingdom. I have seen a perfume distilled from this plant, which is nearly as powerful as the animal musk." Conversations on Nature and Art (Philadelphia, 1839), pp. 48-49.

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man's great faith in these things. "May the Priests of the Temple of Nature," said Samuel L. Knapp, addressing Dartmouth's Phi Beta Kappa Society in 1824,

> soon wear the robes and receive the honors due to them. They have given to every tree, shrub, and flower, a name, and classified every mineral. They have enlarged all the powers of the alembic, beyond the dreams of the alchymist. New planets are discovered in the fields of space, which the piercing eyes of former ages could not find. Our own children are among these prophets of nature, and pursue the course with the devotion and the simplicity of the wise men of the East, who saw the star and followed it for an act of worship.[70]

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[70] Op. cit., p. 18.

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CHAPTER II

The Promethean Theme

Faith in science and technology was faith in their effectiveness as the dual instrument of human progress. On this subject Baconians--our nineteenth-century optimists of power, successors to the eighteenth-century optimists of plan--were apt to wax quite rhapsodical. Here were new forces fruitful in past achievement and big with future promise: the generative forces of a brave new world superior to anything known in past ages. Man "opened ... the great roll of nature, at whose readings the speculations of the old school have fled,"[1] and thus grasped a power which has succeeded in "almost changing the face of the modern earth"[2]--which promises to "gild the world ... with light and wealth."[3] So ran the Promethean theme.[4] If we

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[1]"Darby's View of the United States," Am. Quar. Rev., V (1829), 3.

[2][S. Gilman], "Brown's Philosophy of Mind," N. Am. Rev., XIX (1824), 3.

[3]F. H. Hamilton, Introductory Address, and Catalogue of Students Attending the Annual Course of Lectures on Anatomy and Surgery (Auburn, N.Y., 1837), p. 14.

[4]Cf. Bacon's Novum Organum, I.cxxix:

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want "to appreciate the advance of science," said a leading professor of the young University of Virginia, "it is sufficient for us to look at what the condition of man now *is*, compared with what it *was*."[5] Who could remain unmoved contemplating 'the present rapidity of mankind's progress, and the certainty that it cannot fail to be daily increased by the constant accession of fresh causes and stronger powers?'[6] The "effulgence of the prospect dazzles" Dr. Charles Caldwell of Transylvania University's medical department, and inclines him to exclaim, with the poet,

'*Magnus ab integro seclorum, nascitur ordo.*'[7]

"Well may we say," affirms the learned member of the American Philosophical Society, Duponceau, "that the nineteenth century is not like any of those that preceded it."[8] And the

[Footnote 4, contd.]

> Again, let any one but consider the immense difference between men's lives in the most polished Countries of Europe, and in any wild and Barbarous Region of the New Indies, he will think it so great, that Man may be said to be a God unto man, not only on account of mutual aid and benefits, but from their comparative states: the result of the Arts, and not of the Soil or Climate.

[5]G. Tucker, "On the Progress of Philosophy," *So. Lit. Mess.*, I (1835), 409.

[6]C. Caldwell, "On the Moral and Other Indirect Influences of Rail-Roads," *N. Eng. Mag.*, II (1832), 300.

[7]*Loc. cit.*

[8]"The Translator's Preface," to Sismondi's *Review of the Efforts and Progress of Nations, during the Last Twenty-Five Years* (Philadelphia, 1825), p. 3.

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principal distinguishing feature of this brave new century seems to be its avidity for that very knowledge which is making it so brave and new. "The nineteenth century forms a most remarkable era in the history of the world," according to the prospectus for the Medical Register and Library,[9] because

> from its commencement, the sciences have received, from the more general diffusion of knowledge, an impulse which was not only previously unknown, but which it would have been even considered as visionary to anticipate. The arcana of nature have been exposed, and the most mysterious of her operations elucidated and explained.[10]

A North American contributor sees mankind "animated with an impulse, as in a new crusade, to wrest philosophy from the dominion of errour and superstition."[11] We are living in a period, according to Dr. Walter Channing,[12] "peculiarly favourable for the advance of science" and the increase of man's control of his environment.[13]

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[9]Full title: Register and Library of Medical and Chirurgical Science; a Medical Newspaper. It was edited by Dr. Granville Sharp Pattison, and published at Washington, D.C.

[10]Ibid., I (1833).

[11]"Learned Societies," VIII (1818), 159.

[12]Brother of William Ellery and Edward Tyrell.

[13]"American Medical Botany," N. Am. Rev., VI (1818), 345.

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And as man achieves in this direction, ran the argument, so will civilization advance. It is science and its fruits that constitute the determining factor in human development. Perhaps the faith could not be stated as baldly as that by men and women to whom piety was still a standard of value; but the faith was unmistakably there. One contributor to the Analectic Magazine in 1815 considers it beyond question that

> an acquaintance with the laws of nature is intimately connected with our worldly comforts; nay, to a certain extent, absolutely essential to the civilized condition.

Our Galileos and Boyles, Newtons and Franklins merit veneration as

> luminaries, whose mild and useful light have [sic] cast upon the mazes of worldly things, a radiance which pierces through the gloom, and enlivens the distant prospect.[14]

Stephen Elliott, president of the South Carolina Literary and Philosophical Society, enjoins his fellow members to pursue zealously as their proper work the collection of those facts which contribute to "the proud FABRIC of MODERN SCIENCE" and enlarge "the circle of human observation and improvement." It is, he argues, by the aggregate of such knowledge that a nation's natural resources are made to serve its welfare:

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[14]VI (1815), 127.

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> A nation must seek for wealth and power, by encouraging that active and profound knowledge, which ascertaining the principles, the proportions, the combinations, the affinities of the mineral; the habits, the productions, the qualities, the uses of the vegetable; and the manners, the instincts, the properties, whether noxious or useful, of the animal kingdom, can give to every substance, which it possesses, or can obtain, every appropriate use; can procure for them their ultimate value; can convert them, at will, into instruments of pleasure, of riches, of grandeur, or of power.[15]

The period was prolific in 'improving society" addresses informed with this Promethean spirit. A speaker before the Middlesex Society of Husbandmen and Manufacturers, for instance, remarks the "spirit of deep inquiry" that "has gone abroad among those, who cultivate the earth"; and urges "every farmer who would 'help forward the age,'" as well as himself, to engage in experimentation and to "acquaint himself with the experiments of others."[16] And the Reverend Samuel Miller tells the members of the New Jersey Literary and Philosophical Society that an association such as theirs

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[15] Address to the Literary and Philosophical Society of South-Carolina; Delivered in Charleston, on Wednesday, the 10th August, 1814 (Charleston, 1814), pp. 3-13, 16-18. Although a place is allowed by Elliott for the cultivation of 'polite letters' and the fine arts, he reveals a Baconian tendency to subordinate them in importance (pp. 14-16). For Elliott's own contributions to science, including his Sketch of the Botany of South-Carolina and Georgia, Charleston, S.C., 1821-1824, 2 vols., see W. M. and M. S. Smallwood, Natural History and the American Mind (Columbia University Press, 1941), pp. 102-119.

[16] C. Briggs, Discourse Delivered before the Society of Middlesex Husbandmen and Manufacturers, at Concord, October the Fifth, 1825 (Concord, 1825), pp. 14-16.

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"will, of course, feel itself called upon to inquire, and to labour with unwearied assiduity" in every field of physical science. The advantages accruing from such efforts "are not only real, but immense," he argues, pointing to the example of Great Britain as a country 'whose progress in wealth, in refinement, in comfort of living, in power, and in all the means of national elevation, ever since the principles of science and art have become popular in their culture and application, has been the theme of wonder and eulogium with all who compare her present condition with her situation sixty or seventy years ago.'[17] In the Reverend Miller's opinion the influences responsible for such progress are second only "to the culture of the Religion of Jesus Christ" as the surest source of happiness to any people."[18]

This is indeed to have great powers; but apparently physical science could be credited with still greater potency. In its advance, to quote the American Quarterly of

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[17]But a sensitive Harvard graduate of the middle of the century was, if we may judge from the experience of the young Henry Adams, totally unprepared to grapple with the reality of Birmingham and the Black District--of the "weird gloom which then existed nowhere else, and never had existed before, except in volcanic craters." Education of Henry Adams (Boston and New York, 1918), p. 72.

[18]Discourse Delivered in the Chapel of Nassau-Hall, before the Literary and Philosophical Society of New-Jersey, at Its First Annual Meeting, September 27, 1825 (Princeton, 1825), pp. 29-35.

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1833, not only is it "multiplying" man's "social comforts" and "diminishing his labours," but also "affording both leisure and inducements to moral and intellectual culture."[19] One of the more obvious arguments of those who believed in the moral and intellectual efficacy of science was that, by lifting the veil of mystery from the immanent laws of natural phenomena, it extirpated the ignorance and its offspring superstition which have in past ages presented so determined an obstacle to progress. In the eyes of Oliver Peabody[20] science was the destroyer of "the thousand errors and delusions, which spring from ignorance of physical causes";[21] and his opinion was shared by Dr. John D. Godman of the faculty of Franklin Institute and Rutgers Medical College, who affirmed that

> chemistry and natural philosophy furnish us with the most powerful instruments for dispersing the thick clouds of ignorance which have long enshrouded and enslaved the human mind.[22]

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[19] XIV, 272-273.

[20] Oliver William Bourn Peabody--not to be confused with his twin brother, William Bourn Oliver Peabody, a Unitarian clergyman whose tastes and pursuits were quite similar to his brother's. Oliver Peabody, at first a lawyer, became a Unitarian minister himself in 1844. Both contributed to the periodical literature of the period. Dictionary of American Biography, XIV, 340-341, 343.

[21] "Popular Superstitions," N. Am. Rev., XXXIV (1832), 220.

[22] "On the Study of Natural History," in Addresses Delivered on Various Public Occasions (Philadelphia, 1829), p. 113.

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Under their influence it is, according to Oliver Peabody, that now

> since the days of Franklin, the veriest simplicity is in no danger of mistaking lightning for the exhibition of a malignant demon's influence; and a child may laugh at the grave pretensions of astrology.[23]

Apparently such a change is inseparable from moral consequence,[24] for he concludes that "in the same proportion" as scientific knowledge advances,

> is intellectual and moral science aided in its progress; each in its measure, promotes and cherishes the other; each and all carry on the great work of improvement, urging us onward to the attainment of the end of all true science, the elevation, if we may not say the perfection, of our nature.[25]

A variety of reasons was adduced to prove this 'elevation of our nature' the inevitable blessing of scientific pursuits. Science, it was contended, invigorates, disciplines and enriches the mind; it provides objects of contemplation and helps to develop concepts that ennoble one's thoughts. Moreover, by attracting the mind to a wholesome preoccupation,

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[23] Op. cit., p. 220.

[24] Intimately related to physical advantages, such arguments furnish intimations of scientific naturalism in the thought of Puritan-bred divines and educators to whom, however, the idea of discipline was still exceedingly valid. No such conflict was adumbrated, of course, in the argument for the intellectual advantages of the rise of science, although this was closely related to the argument for moral efficacy.

[25] Loc. cit.

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it actively fends off the mischief which Satan so readily finds for idle hands. And above all, science is a handmaid of piety: "the undevout astronomer is mad!"

All these arguments and more, with additional refinements, are copious in early nineteenth-century America. They figure prominently in the writings and addresses of educational reformers who sought a more important place for physical sciences in the schools.[26] The 'Darwinian' concept of evolution--of natural selection and survival of the fittest--had not yet darkened the theological horizon to awaken fears for the very foundations of religion. The concept of evolution then obtaining could readily be harmonized with the idea of the worthy soul's translation from its earthly to its heavenly sphere--when, in the Reverend Timothy Flint's words, "depositing a worn and useless fabric of clay with the general mass of that which once had life," it enters "into the light, to assume the relations, and commence the duties of the still onward progress of a higher sphere."[27] And Paley, be it remembered, was still an authoritative voice. Hence, even in the face of newly uncovered evidence as to the age of the earth, the pious

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[26]Vid. infra, Part II, chs. i, ii, iii.

[27]Lectures upon Natural History, Geology, Chemistry, the Application of Steam, and Interesting Discoveries in the Arts (Boston and Cincinnati, 1833), p. 408. Vid. infra, pp. 75-86.

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Christian found it not at all difficult to see in science a valuable ally for piety, morality, and the good life generally. (Scripture must be rightly understood, that is all!)

So we find the Reverend Alonzo Potter, vice-president of Union College and before long (1845) to become a bishop, quite unapprehensive of any conflict between Baconianism and higher reaches of man's mind and heart. During the fifteen years in which he taught moral and intellectual philosophy and political economy at Union College, he must have inculcated Baconian principles in a rather numerous academic progeny. His views on the function of science and the useful arts in civilization are brought together in a textbook of technology similar to that produced some years before by that zealous advocate of scientific and technological education, Dr. Bigelow.[28] It is in itself significant that a "professor of moral philosophy and rhetoric" (so the title-page informs us) should father a volume titled Principles of Science Applied to the Domestic and Mechanic Arts, and to Manufactures and Agriculture: with Reflections on the Progress of the Arts, and Their Influence on National Welfare.[29] Under this title Dr. Potter, besides conveying

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[28]Vid. infra, pp. 300, 306-307.

[29]Did England's Rev. Dionysius Lardner set the precedent for such direction of clerical energies? (Vid. ante,

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certain primary facts about science and the useful or "industrious" arts, endeavors to impress his readers with the "dependence of the arts on science" and man's dependence on both for personal and social welfare.[30] Man, he asserts, weakest of animals when left to his natural powers, becomes the mightiest through technological knowledge: knowledge that is power.[31] For hence,

> not only animals, with their fleetness and strength, but even winds, and waves, and heat, and gravity, have been trained to obey him; and, operating by means of machinery, they now fabricate for him, almost without intervention on his part, the choicest food and raiment; transport him, with the celerity of the deer

[Footnote 29, contd.]

p. 18.) Potter's work was first published in 1841 by Marsh, Capen, Lyon and Webb, a Boston firm responsible, be it noted, for the publication of a long list of expositions and defenses of phrenology. Much of the content of Potter's book was, we are told, delivered in lectures before 1840: "The subject is foreign from the usual course of the Author's studies, and was at first undertaken for the lecture room, rather than for the press. Large portions of it have been delivered in the form of lectures before young men, in Lyceums, and Mechanics' Institutes, and also before the students of the college with which the Author is connected." ("Advertisement," p. 3.)

[30] Ibid., pp. 19, 36.

[31] Potter is found directly utilizing the Baconian maxim:

> 'Knowledge is power.' Instruct the artisan in the powers and principles of Nature, and he can always employ them in the cheapest and most effectual manner. But ignorance has no security from error.... Ignorance, therefore, is weakness.
>
> Ibid., p. 22.

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> or the antelope, from place to place; and surround him with all the comforts and conveniences of life.[32]

Civilization, in short, is founded on the useful arts. At first man in his primitive state seeks only to meet his needs empirically, but for the higher stages of culture the application of science to the useful arts is requisite. It is important, Dr. Potter emphasizes, that we be aware of the vital connection between science and the useful arts: "few subjects are entitled to more attention."[33]

As for the specific moral and intellectual influence of science and its application, it is actually held to raise man above what Irving Babbitt would have considered a feature of "naturism." Dr. Potter contends that the age is especially distinguished by "the substitution of intelligence and knowledge for mere physical force"--by increased respect for intellect and diminished respect for muscle. Indeed, this age which demonstrates "so emphatically" that "knowledge is power" has in following that maxim proven that

> in proportion as the human mind is enlightened, it learns its own dignity; discovers the magic influence conferred by science on its possessor; and comes to rate, at something like their real value, those humble attributes which it possesses in common with the brutes.[34]

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[32] Op. cit., pp. 10-11.

[33] Ibid., pp. 11-12.

[34] Ibid., pp. 248-249.

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He is willing to admit that to the "better state of things" in government, education, "practical benevolence," and domestic and public economy "various causes have conduced." But "one of the main, if not the main, cause, of this improvement," he insists,

> will be found in the example, which, after the publication of the 'Novum Organum,' was so early set, of blending physical science with the labors of industry.[35]

That is to say--in the achievement of Power. Its general effect has been to "greatly increase the physical enjoyments of mankind," an effect which "is by no means to be despised," for (and here he launches unequivocally into the Promethean theme)

> the happiness of a being, constituted as man is, depends not a little on his food, raiment, furniture, implements, &c. When these are abundant, and of good quality they not only satisfy the cravings of appetite, but serve, also, to remove many temptations to sensuality and crime; afford leisure for intellectual improvement; and, by exercising thought, and gratifying taste, tend to refine and exalt the whole man. Hence it becomes an object of high importance to secure, for the mass of a people, the greatest possible amount of physical comforts, provided they are the fruit of their own industry and intelligence; and this has been one of the most signal benefits conferred on mankind by modern art.[36]

Nor does Dr. Potter neglect the other arguments customarily

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[35] Op. cit., p. 251.

[36] Ibid., pp. 252-253.

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invoked: that through technology the nation's prosperity is advanced, and wholesomely advanced, because it exerts a tendency to equalize property; and further that technology affords more employment and thus reduces idleness, the prime mischief-breeder. An additional value, we are reminded, is that manufacturing can do away with the idleness of women and children as well! This, apparently, on the principle that we cannot have too much of a good thing. Incidentally here Dr. Potter betrays a Northerner's sympathy for the 'American System' in his anxiety to exalt the manufacturing interests as a source of social blessings. He argues that labor engaged in manufacturing will be more skillful, more efficient and more intelligent than agricultural labor, since manufacturing, affording a variety of jobs suited to a variety of talents, tastes and ages, and inciting to wholesome competition, stimulates and improves the intellect. Moreover, it is his opinion that the machinery in a factory, as palpable evidence of the power of intellect and the reign of progress, tends to impress workers with the power of man to elevate his condition and with the desirability of intellectual cultivation. In this respect also the farm is inferior to that token of the might of Baconianism, the factory, for

> in the operations of a large manufactory, mind seems to have won a perfect mastery even over the elements of Nature.[37]

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[37] Op. cit., pp. 260-267.

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A Boston clergyman, the Reverend Orville Dewey, shared similar sentiments. When in 1837 he came to speak at the American Institute's annual exhibition in New York, it was, he insisted, to take part in celebrating "the great and noble" and not the "humble" arts of industry. To demean them from their proper status, he felt, would be to court rebuke from the exhibition before him: a spectacle characteristic of the age, signalizing the lenitive process experienced by society under the influence of the advancing arts of peace:

> In other days, it would have been the tournament, or the feasting hall, hung round with helmets and swords, and the grim and shaggy trophies of the chase.

Now, however,

> we see other tokens; the products of the peaceful loom and planing tool, carving and tapestry, works of equal utility and beauty in iron, and marble and glass, and shining metals; comforts for home, and conveniences for travel; and books, in bindings splendid enough to seduce the eye from those attractive and ponderous ledgers--in which there is to be so much more profitable writing.[38]

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[38]"The Arts of Industry, with Their Moral and Intellectual Influence upon Society," in Works (New York, 1868), II, 285-286.

So too argued the Reverend William Allen, in his inaugural address as president of Bowdoin (1820): The sciences and arts are to be cultivated zealously in college because of their "important influence on the general state of society," taming "the ferocious passions" and converting "the barbarous and wandering tribes ... into compact and civilized nations." A Decade of Addresses, Delivered, from 1820 to 1829, to the Senior Classes at Bowdoin College; together with an Inaugural Address: to which Is Added a Dudleian Lecture, Delivered May 12, 1830, at Harvard University (Concord, 1830), pp. 13-14.

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It is especially the intellectual and moral influence of the industrial arts to which he wishes to call attention. He admits that material advances must be evaluated by their effect upon "the mind and heart."

> For, to what purpose is it, that all the comforts and elegancies of life are spread around us; to what purpose is it, that the products of the forest and the mine, and all the powers of earth, air, fire and water, are brought into subservience to the human will; to what purpose is it, that the earth is better tilled, and the ocean is more successfully navigated, and more splendid cities are rising all round its spreading shores, if man, in the presence of all this profusion and magnificence is only growing more ignorant, slavish, effeminate and corrupt?[39]

But he does not believe that such one-sided progress is possible; he maintains that the "mechanic arts" have a "natural tendency and immense power to improve society" intellectually and morally as well as physically. In the first place, he contends, since the mind takes its color and bent from environment, any improvement in "the arts of living" resulting from science and invention cannot but help to improve the minds of people affected thereby. Further, he argues, the "mechanic arts improve society by increasing its comforts and lessening its toils." Of course, he would have us realize that he is aware of the danger of excessive indulgence in the comforts of life as "vicious and enervating." However,

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[39] Op. cit., p. 288.

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in his opinion, a proper amount of time freed from the necessity of laboring for subsistence is "good for our moral nature," as developing "good nature, gentleness, generosity and patience." Freedom from such discomforts in life as smoky or drafty rooms can help not only the disposition, but increase mental soundness and efficiency.[40] Nor should we neglect the salubrious effect of science and industry in promoting cleanliness and physical health. Furthermore, relief from long and arduous toil means leisure for intellectual pursuits. "Will not the time come," he asks,

> when the improvements in machinery will yet more signally relieve mankind; when not only their strength, but their attention in a greater degree, may be spared from the care of gaining a subsistence; when, in other words, they will give less labour to mere manual tasks, and have more time for reading and thinking.[41]

But this is apparently not incompatible with an influence in accord with the best Puritan tradition: Labor is a law of man's constitution, he reminds his listeners, and virtue is still the natural product of industriousness; and since

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[40]Another echo of relativist morality. Here is a clergyman who at least would not put right conduct exclusively upon the basis of self-discipline! In reading such addresses as this one feels that the speaker is trying to meet the expectations of his audience.

[41]Op. cit., pp. 289-297.

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the development of machinery broadens opportunity for employment, both virtue and prosperity result for the community.[42] Again, a beneficial effect socially is to be anticipated by the application of "mechanic art" to transportation, which increases intercourse among the people. "Our steamboats and rail-roads," he asserts, "are tending constantly to make us a more homogeneous, sympathizing, and humane people."[43] And, above all, it is as handmaid to piety that "art" exerts a moral influence: "It leads the mind to the infinite wisdom of nature, to the infinite wisdom of its Author." The worker who sees all things adapted to the use of man should be filled with reverence before the Creator.[44] The source of so many benefactions seemed to merit an inspiring peroration:

> It is the glory of art that it penetrates, and developes the wonders and bounties of nature. It draws their richness from the valleys and their secret stores from the mountains. It leads forth every year fairer flocks and herds upon the hills; it yokes the ox to the plough, and trains the fiery steed to its car. It plants the unsightly germ, and rears it into vegetable beauty; it takes the dull ore and transfuses it into splendour, or gives it the edge of the tool or the lancet; it gathers the filaments which nature has curiously made, and weaves them into soft and compact fabrics. It

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[42] Op. cit., pp. 298-303.

[43] Ibid., pp. 305-306.

[44] Ibid., pp. 307-309.

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> sends out its ships to discover unknown seas and shores; or it plunges into its work-shops at home, to detect the secret that is locked up in mineral, or is flowing in liquid matter. It scans the spheres and systems of heaven with its far sight, or turns with microscopic eye, and finds in the drops that sparkle in the sun, other worlds crowded with life. Yet more; mechanic art is the handmaid of society. It has made man its special favourite. It clothes him with fine linen and soft raiment. It builds him houses, it kindles the cheerful fire, it lights the evening lamp, it spreads before him the manifold pages of wisdom: it delights his eye with gracefulness, it charms his ear with music: it multiplies the facilities of communication and the ties of brotherhood; it is the softener of all domestic charities, it is the bond of nations.[45]

In short, by making possible an environment more conducive to dignified and wholesome living, by promoting industrious habits, by bringing men more closely together in body and hence in spirit, and by revealing the Creator in all his beneficence--by all these fruits are science and technology worthy of reverence and earnest cultivation. It is not surprising that the Reverend Dewey, strong in the social consciousness of a Unitarian minister who had been associated with Dr. Channing, should take up the cause of science and the useful arts. Was this not also the cause of social service?

Dr. Bigelow would certainly have agreed. Over two decades before (1816), he had taken upon himself the duties

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[45] Op. cit., pp. 309-310.

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of Rumford professor at Harvard, with the observation that the "uniform tendency" of "the progress of philosophy" has been "to meliorate the condition and promote the happiness of mankind," rather than "merely to aggrandize the individuals who cultivate it." For most of the labors of the scientist, he adds, "have a direct bearing upon the wants of society, and tend to objects of real use." Accordingly,

> the student, who would be serviceable to his country, may enlist himself in this department of labour, almost with the certainty of being able to contribute something to the general good.[46]

There were many others to echo the same belief, and thus to help build up popular veneration for the scientist and inventor as the modern Prometheans. To Griscom the supreme genius productive of national greatness was represented in Arkwright. Nor are charges respecting the plight of England's working classes permitted to dim the famed inventor's glory. "There are, indeed," counters Dr. Griscom,

> few of the blessings of Providence, which are not liable to perversion and abuse. That no evils have attended the erection and multiplication of large cotton factories, in this and other nations, it would be folly to deny; but these evils are doubtless of a nature that do not forbid the application of remedies adequate to their removal ... and whoever takes a rational survey of the immense benefits which man derives from every important extension of

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[46]"Dr. Bigelow's Inaugural Address," N. Am. Rev., IV (1816), 272.

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> his dominion over matter,--the vast accession to his comforts, which the arts afford, and the innumerable friendly ties which are thus made to bind the various parts of a nation into one united brotherhood, and even to form a cementing charm between distant and remote nations, will not hesitate a moment, to admit the vast amount of obligation, which England and the world are under, to such a genius as Sir Richard Arkwright.[47]

And though Griscom was disturbed at Portsmouth, England, by the spectacle of man's knowledge and ingenuity being directed towards the construction of warships, and though thoughts of human depravity momentarily beclouded his mind, nevertheless the sanguine Baconian in him rallied to ask:

> Is it folly to think that the time may arrive, when national strength will be directed to this grand object, to the exclusion of warlike preparation? And is it presumption to believe, that through the combined efforts of good men, under the blessing of Providence,[48] this benign change in the feelings and enjoyments of mankind, will in time be effected?[49]

Elsewhere he pays tribute to the "enriching and humanizing influence" of the sciences.[50] True, he insistently urges

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[47] Year in Europe, II, 264-265.

[48] I have found that the phrase "under Providence" serves the Baconian as a convenient token to satisfy any theological scruples or apprehensions he or his audience may feel. The argument could, once the catchphrase was levied, be then safely launched into materialism.

[49] Year in Europe, II, p. 232.

[50] Discourse on the Importance of Character and Education in the United States (New York, 1823), p. 24.

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the prior claims of education as the basis of social progress, but it is always a Baconian education: utilitarian and sociological. He would have America realize that education must be zealously promoted and diffused, but precisely because it is the ultimate basis of the creation of those instruments of power which advance a nation's prosperity and culture, because education provides the "mind" that "governs matter"--because, in short, there can be no steam-engines without trained minds.[51] He finds it

> well worthy of remark, that the establishment and progress of Lancasterian or monitorial Schools, have been contemporaneous with the improvements of the Steam Engine, and with the wonderful applications of that new power to the wants of mankind.[52]

And we may expect the most splendid consequences for a nation motivated by this spirit, in contrast to the stagnation that distinguishes Asiatic nations. Prometheus in the form of a czar is invoked by Dr. Griscom to drive home his point:

> It was not alone by working in the dockyards of Saardam and Deptford, that Peter the Great laid the foundation of his immense power, and gave that astonishing impulse to civilization, which has marked the progress of the Russian empire:--he also erected colleges in the principal cities; he established a Medical School; he laid out a Botanical Garden; he erected an

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[51] Op. cit., pp. 5-10; Year in Europe, I, 382-401; Memoir, pp. 329-33.

[52] Discourse on Importance of Character and Education, p. 8.

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> Astronomical Observatory; and he planned the foundation of the Imperial Academy of Sciences, in the very city of which he laid the corner stone. By means like these, so industriously pursued by his successors, ... has that nation, in little more than a century, sprung from a state of barbarism and political insignificance, to the highest rank of splendour and power.[53]

In the individual's progress likewise, so Dr. Griscom firmly believes, the study of the sciences and arts are of inestimable value. In fact, scientific and technical knowledge

> has so intimate a connection with our daily wants, with the aspirations of our minds, with our habits of thinking and acting, and in short with the whole circle of our intelligence, that to be destitute of this knowledge, is to fail in one of the most useful and important concerns of education.[54]

Indeed, the aura of sanctity surrounds it--a strong point to one of Dr. Griscom's Hebraic temperament.[55]

> As rational and social creatures, the study of the works of that infinitely Wise Being, by which we are all supported, and without whose daily and hourly ministrations we should inevitably perish, cannot but tend to enrich our minds with the noblest kind of intelligence, as well as to warm our hearts with the delightful feeling of love, gratitude, and devotion.[56]

To Professor Farrar of Harvard this "most enlightened

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[53] Discourse on Importance of Character and Education, pp. 8-10.

[54] Ibid., p. 24.

[55] Vid. infra, pp. 421-423.

[56] Ibid., p. 25.

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age of the world" owes its existence fundamentally to the power of science. "Whence is it," he asks,

> that we have derived all this superiority over the nations of antiquity, but from our scientific researches. By more carefully examining a certain species of iron ore, that had long been known, we find, that it will indicate the points of the compass. By making use of a familiar principle in optics, the equality of the angles of incidence and reflection, in connexion with a graduated arc, we obtain the quadrant.[57]

These and other fruits of science, Farrar explains, have made possible modern navigation with all its momentous social consequences. Likewise has science blessed man with the 'introduction of kine pox, Davy's safety lamp, and a developed art of war which gives civilized nations security against barbarous peoples.' These and more are the unparalleled blessings of devotion to the "new philosophy."

> Scientists examine and improve the processes in the arts; weigh and analyse air; calculate the height of the atmosphere, and its influence upon celestial observations; count the stars, observe their positions, and watch their motions.
>
> Expeditions are fitted out to different parts of the earth for the purpose of ascertaining its dimensions and figure. A company of philosophers is seen with their telescopes and quadrants amid the snows of Lapland, and another pursuing the same delicate and difficult enterprise among the savages and whirlwinds of the Andes.

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[57] Op. cit., pp. 163-165.

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Thus advances the mighty cavalcade of science, in the interests of human society. It is a grand campaign for enlightenment.

> We live to trace the progress of this holy war, and to witness its success in the emancipation of the human understanding, in a respect for truth taking the place of a blind submission to authority, in a restoration of a large portion of our race to the condition of thinking, intelligent, independent beings.

"It is no longer a question," he adds,

> whether the mind be progressive, whether like the brutes, we soon arrive at the greatest improvement of which we are capable, whether it is our lot to labour and spend our strength for nought, to grope on from age to age in an endless labyrinth of doubt and perplexity.[58]

No, the question has been settled by science and invention. And not alone have these, operating in conjunction, brought the human race more closely together and spread enlightenment; not alone have they brought to our homes "the products of foreign arts, and ... the fruits of foreign lands," provided increased employment and equalized wealth. But they have meant even the expansion of the limited faculties with which man is originally endowed.[59] By means of science and the arts, Professor Farrar concludes,

> we have ... changed our intellectual no less than physical condition. While we have opened

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[58] Op. cit., pp. 158-159.

[59] Ibid., pp. 165-166.

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> an intercourse with our fellow men upon this globe, we have devised methods of communication also with the universe around us; we have penetrated on the one hand into those worlds of animate and inanimate atoms that lie below us, and on the other into those vast regions that expand above us. We have become a spectacle of wonder to ourselves, and we return from this wide survey, to ponder upon our nature, duty and destination.
>
> 'Ad summam, sapiens uno minor est Jove, dives, Liber, honoratus, pulcher, Rex denique Regum.'[60]

"By the study of science," Professor Renwick of Columbia announced at the New York Atheneum in 1824, "even ordinary minds may catch a spark of the Promethean fire of genius," to advance "arts, manufactures, and civilization ... by their instructed industry."[61] As for "the effect of applied science upon individual happiness,"

> we may judge from a brief recapitulation of the advantages we ourselves enjoy, by living in an age in which all the mechanic arts have been carried by its aid to a state of unexampled perfection, and in a city where a successful commerce enables us to make the most distant regions of the earth contribute to supply our wants. For us the silk-worms of China, Italy, and Provence, exert their art, and the looms of Nankin, Lyons, Florence, and London, labour; for us the sheep of Saxony and Spain are shorn, and the clothiers of Gloster [sic] and Yorkshire ply their shuttles; for us the cotton of Carolina and Bourbon is rolled upon the spindles of Manchester; for us is

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[60] Op. cit., pp. 167-168.

[61] "Lecture Introductory to a Course of Lectures on Applied Mechanics, Delivered at the New-York Atheneum, in the Winter of the Years 1824-1825," New-York Review and Atheneum, II (1825-6), 47-48.

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> raised the hemp of the Ukraine, the flax of Munster, and the sugar cane of the Indies; for us bloom the spicy forests of Sumatra and the Moluccas, the coffee gardens of Yemen, Java and Cuba; to close our apartments, we interpose screens of transparent substance pervious to light, and the calorific rays of the sun, but impervious to the blast, and retentive of the grosser heat that we generate by the process of combustion; to give us light, the whale is pursued to his most secret haunts among the eternal ices of either pole; and soon will the gaseous product of his oil circulate through our streets, like the vital fluids through the veins and arteries of the animal frame.

So much for the glory and romance of our brave new techno-commercial age. If you are tempted to ask about mental improvement, Renwick adds his testimony to Griscom's and Farrar's. Increased mental powers result from greater accessibility of learning; and modern man, blessed with the miracle of printing, is able to obtain the works of European authors "yet moist from the presses of London, Paris, Milan, and Leipsic."[62]

Walter R. Johnson of the Franklin Institute is also filled with a sense of the glory of an age that has transcended all others because it has wisely learned the value of technology. "To be destitute ... of the science and skill which are necessary to the prosecution of mechanic arts," he assures his audience in an introductory address to a course of Franklin Institute lectures (1828), "is

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[62] Op. cit., pp. 105-106.

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certainly one of the characteristics of a state of barbarism."[63] Addressing the American Institute of Instruction in 1835, he reiterates his belief in the dependence of human advance on the development of science and its application.

> Take into view the food, the clothing, the habitations of men; the healthiness, the longevity, the intelligence of whole communities; witness the unfrequency in our times of famines and their direful consequences; the improvement, even in old and long cultivated countries, in the productiveness of those very soils which once yielded but a scanty pittance; the facilities of transportation, which enhance immeasurably the value of every production of art and labor, and the multitude of positive pleasures, before unknown to the human race, which are now added to the value of existence by the conquests of intellect over material things. Bring into the account, the intimate connexion between improvement in the useful arts, and every other kind of advancement in society, and add, if you please, the fact ... that the reign of the useful arts is the reign of common sense, and further, that the freedom and encouragement enjoyed by these arts, is, in every nation, the measure or exponent of that nation's freedom in every other particular.[64]

When Denison Olmsted, professor of mathematics and natural philosophy at Yale, delivered the annual Phi Beta Kappa Address at New Haven in 1827, he also took the occasion

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[63] AJE, IV (1829), p. 24. The course of lectures was on mechanics and natural philosophy.

[64] "On Schools of the Arts," in Introductory Discourse and the Lectures Delivered before the American Institute of Instruction, in Boston, August, 1835 (Boston, 1836), pp. 275-276.

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to speak "on the progressive state of the present age." The result, of course, was a series of the usual variations on the Promethean theme. Without the compass and without his knowledge of metals, we are told, "man could have advanced in civilization but little father [sic] than the Hottentot or the Patagonian."[65] But he has found out and has already traveled far along the path of progress. And this is only the beginning, we may be sure. Who knows what knowledge and power lie ahead for man to seize and harness to his use?

> Shall we limit nature, as the ancients did the world, precisely by our own conquests? Or shall we not rather conclude that other new fields of research, like that opened to Galvani, will allure successive ages onward, until man shall tame the lightning that now rages in the skies, and make it the humble menial of his power? The time was when man stood upon the roaring beach, and imagined that the waves rolled merely to affright, and that the waters lurked in their profound caverns merely to drown him; but he learned at length to spread his canvass [sic] before the wind, and to make it bear him to the ends of the earth. In like manner perchance the whirlwind raves, the earthquake shakes the solid earth, the volcano roars and burns, to admonish us of powers of nature created for our benefit, the control of which is at last to confer on man the sum of his earthly greatness.[66]

Do not past achievements in science and the useful arts, as

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[65] Oration on the Progressive State of the Present Age (New Haven, 1827), p. 20.

[66] Ibid., pp. 19-20.

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well as "the unlimited powers of chemistry to form new combinations of matter," point to a future for man "so far beyond his present mark" as will make this seem "but the infancy of his being?"[67] The prospect goes beyond even

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[67] Oration on the Progressive State of the Present Age, pp. 7-20.

And he adds, to emphasize the magnitude of this promise of the future:

> Will some new discovery, like the telescope or the microscope, hereafter open to the delighted and astonished eye new ranges of existence? Will some new instrument of investigation like logarithms, or fluxions, reduce beyond expression the labor of calculation, and carry the researches of the mathematician into regions, where even the imagination is at present too slow to wander? In some unseemly mineral, or in some despised neglected plant, or in some chemical compound now shunned as poison, shall the physician one day find concealed the cure designed by heaven for consumption, palsy, madness? Shall the knife of the surgeon open for itself a safe access to the vitals, and pluck from thence the devouring cancer? Shall the historian of the arts and sciences of some future age, exulting in his pride, as we do now, tell how in the nineteenth century, astronomers just hinted at lunar mountains and volcanoes--how philosophers wondered to what mysterious agent to refer the phenomena of attraction, of heat, of electricity, of magnetism; whether other forms of matter more etherial [sic] directed their energies, or whether some secret spirit, sent forth from the Divinity, guided all their movements;--how that early age marvelled what it was that heaved the sea and rocked the solid earth; how they fluttered in their frail balloons; how they boasted of having developed the mighty powers of steam, as though they in their infant society, had discovered all the secrets of nature!
>
> Ibid., p. 21.

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astonishing advances in man's physical welfare; for "compared with the intellectual and moral culture which it is one day to exhibit, the world is yet a waste."[68]

Even so staunch a friend of *litterae humaniores*[69] as the Knickerbocker patron of the arts, Gulian Verplanck, shares the Baconian spirit of the age--acclaims science and technology as forces which, in their silent advance, produce "changes as gigantic in their influence on human happiness, as those revolutions that shake the world and give birth to nations." In fact, he agrees with Lord Bacon that, whereas the value of a statesman's achievement "is confined within the circle of one age or nation," that of the man who has "invented or improved the arts and commodities of human life ... is indeed like the benefits of heaven, being permanent and universal."[70]

Another New York figure, Samuel Woodworth, who should

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[68] *Oration on the Progressive State of the Present Age*, p. 23.

[69] Cf. *The Right Moral Influence and Use of Liberal Studies. A Discourse Delivered after the Annual Commencement of Geneva College, August 7th, 1833*, New York, 1833.

[70] "An Address Delivered before the Philolexian and Peithologian Societies, of Columbia College," in *Discourses and Addresses on Subjects of American History, Arts, and Literature* (New York, 1833), pp. 194-195.

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perhaps be known as the poet of Baconianism, repeatedly sings the splendor of modern improvement and the glory of its agencies--particularly printing. As a youth, Woodworth had learned the printer's trade with Benjamin Russell of Boston, and apparently had imbibed great admiration for his 'mystery.' At any rate he has left us some eight almost forgotten "Typographical Odes" lauding the art of printing as the foundation of freedom and enlightenment.[71] The spirit of his "Printing and Independence," with its suggestive apotheosis of science and the useful arts, is the spirit of them all.

> When, wrapped in folds of papal gloom,
> Dark Superstition awed the world,
> Consigned fair knowledge to the tomb,
> And Error's sable flag unfurled;
> Earth heard the mandate from the skies--
> 'Let there be light--great ART, arise!'
>
> Young Science wiped her tears and smiled,
> And infant Genius plumed his wing;
> The arts assemble round the child,
> And all this glowing chorus sing--
> Rise, sun of science! quick, arise!
> And lend thy light to darkened eyes.

Then arose "our art, and man had light."[72] The art of printing was not of course the only aspect of the daedalian to inspire Woodworth. There are also his "canal poems"[73] among

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[71]Cf. Poetical Works, edited by his son (New York, 1861), II, 173-191.

[72]Ibid., II, 182-183.

[73]"An Ode, for the Grand Canal Celebration, Nov. 4, 1825," ibid., I, 247-250; "The Grand Canal," ibid., I, 251-252.

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similarly naïve and patriotic acclamations of the brave new world, such as his aeronautical verses celebrating balloon ascensions. "Durant's Address on Ascending with a Balloon from Castle Garden" closes with the overwhelming apostrophe:

> This, Science, is thy victory!
> Hail to a scene sublimely grand!
> Hail!--hail Columbia! happy land![74]

With similar enthusiasm the Unitarian minister, John Pierpont, requisitioned his muse for the first exhibition of the Massachusetts Charitable Mechanics' Association.

> Not with a conqueror's song
> Thy courts, O God, we throng,
> For battles gained--

sang Pierpont; but rather "for Art":

> Art, that, from shore to shore,
> Moves, without sail or oar,
> 'Gainst winds and tides;
> Or, high o'er earth and seas,
> Sits in her car at ease,
> And heavenward, on the breeze,
> Triumphant rides.
>
> Art, that, through mountain
> Breaks, that her horseless cars
> Self-moved may go;
> And, without looking back,
> Rolls, on her iron track,
> Where the white cataract
> Thunders below.[75]

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[74] Op. cit., I, 254.

[75] "First Fair and Exhibition of the Massachusetts Charitable Mechanics' Association (1837)," Airs of Palestine, and Other Poems (Boston and London, 1840), pp. 174-175. The poem closes with the assurance that "Art" sanctifies--and "gladly"--"her works and powers" to the "Most High."

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The power to cover more space in less time has always seemed to impress the Baconian mind as especially fruitful. Thus the younger Rantoul maintained that modern navigation

> has been the great promoter of civilization, and has done more than any other agent to bring about that community of interest and of feeling, which is beginning to unite nations in bonds more durable than the fragile treaties formed by jealous politicians.[76]

And Dr. Charles Caldwell of Transylvania University's medical department was so inspired by the promise of railroad transportation, that he devoted an entire address to heralding its future blessings. Perhaps it was the influence of the West abuilding, but the Baconian views of Dr. Caldwell always seem to have appeared in distillate. With a baldness surprising to a reader in an age that has reason enough to question the Baconian optimism of the last century, he argued that the nation may expect momentous good from the development of railroads--good that involves not solely material progress, but also, and concomitantly, intellectual and moral improvement. He saw it bringing mankind more closely together, thus doing "a thousand fold more" towards "the suppression of war ... than all the Peace and Missionary Societies, that ever will be established." Further, he

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[76] Op. cit., p. 90.

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saw it unifying the country and helping it to achieve "greatness and splendor," thereby encouraging patriotism.[77] He saw it promoting industrious habits, and hence morality. By its agency, he anticipated an unprecedented diffusion of knowledge, of cultural achievement, of wealth and refinement. And these also were expected to have important positive moral consequences.[78] But railway systems were

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[77] Op. cit., pp. 293-296. Apparently Dr. Caldwell does not anticipate any incompatibility between an impulse towards international peace acting simultaneously with an impulse towards patriotism.

[78] Ibid., pp. 290-293, 296-299.

Such an elegant and comfortable mode of travel as the railroad provides, argued Caldwell, "will insure the presence of elegant travelers," particularly women," and that is sure to elevate the general social tone because people are influenced by those they admire and try to imitate their good breeding and taste. "Even the elegant construction and ornamental beauty of the cars will have a favorable effect." Ibid., pp. 297-298. He argues that wealth and comfort "are active sources of moral influence on a threefold ground":

> They afford protection from temptations to vice, which poverty and want are unable to resist,--keen necessity vanquishing, at times, the most laudable resolutions. They give a sense of character, which serves as a shield from profligate indulgencies, and degrading conduct. And comfort itself is, in its nature, a sort of guaranty against the commission of crime. Comfort is a compound of sundry grateful feelings, most of them of a domestic nature. It therefore produces content. But such a state of mind cannot fail to favor virtue. It induces men to spend their evenings, and other leisure hours, at home, in the bosoms of their families, where they are secure from vicious examples and allurements. (P. 296.)

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themselves, directly, to help elevate man's spiritual nature. For "objects of exalted power and grandeur," when seriously contemplated, "impart ... greater compass and strength" to the mind. What is true of "Alpine scenery and an embattled ocean" is, according to Dr. Caldwell, true of a railroad. Does not a railroad also possess "vastness and magnificence"?

> Let us, for a moment, look forward into future years, contemplate, in fancy, our country thus provided with rail-road conveyances, and suppose the whole pageant presented to us at a single view. Art has never yet prepared, earth beheld, or imagination conceived, a picture so striking. It is all in action, under a power that is stupendous; and its grandeur and magnificence are overwhelming to the mind. The rush of the waters of Niagara is sublime. But it is not comparable to the panorama I would delineate, had I powers adequate to it. Throughout one of the most extensive empires of the world, every section is studded with cars, bearing hundreds of thousands of well dressed and gay inhabitants, and uncomputed millions of wealth, in the form of merchandize; and the whole is conveying to different points, with surpassing grace and majesty of movement, and the fleetness of the antelope, at the top of its speed.[79]

This anticipated elevation is sublime--even religious (if characteristically anthropocentric)--in character. And Dr. Caldwell, in all the fervor of his Promethean faith, should be allowed to expound for himself here also. "Nor, in speaking of the magnificence of a system of Rail-roads, in full operation," he announces

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[79] Op. cit., pp. 292-293.

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> do I allude merely to the external or visible sublimity which it exhibits. The pageant is instinct with moral grandeur, which makes a deeper and more salutary impression on the mind. The immense power, which it manifests, and which is developed, controled [sic], and directed by human means, excites, in those who see and contemplate it, an exalted idea of the dignity of their race. It awakens in them, therefore, higher respect for themselves, as a portion of that race. It exhibits man to them, as possessing a more elevated rank in creation, than they had assigned to him. This becomes a source of livelier gratitude to the Being, who placed him there; and thus are the highest and best feelings of our nature improved, and motives to piety and devotion confirmed. Those who possess this lofty sense of their own standing, cannot descend to mingle with the unworthy, and follow their examples, or sully themselves, in any way, with moral pollution. On the contrary, they set an example, invaluable to society, for others to follow.[80]

If we pause to imagine how a medieval moralist would feel about the mere suspicion that good might derive from Superbia, the changes that produced the Baconian mind will appear almost phenomenal!

Almost as a kind of triune symbol of the Promethean, we find printing, the mariner's compass and gunpowder also persistently wrought into the Baconian argument.[81] To one writer in the New England Magazine in 1832 they are "three

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[80] Op. cit., p. 298. Caldwell's sentimental naturalism and ethical relativism are evident throughout the argument. It should be noted that he was a staunch supporter of phrenology. Cf. his Phrenology Vindicated ..., New York, 1837.

[81] Cf. Bacon, Novum Organum, I.ccix.

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seemingly inglorious discoveries," yet agencies that "improved the world, and changed the affairs of men, more than any king, conqueror or reformer ever did." The compass with the art of printing (and its sister-art, engraving) "gradually banished barbarism, and humanized the world." "The multiplication of books by the Ars Artium omnium Conservatrix," we are told,

> and of drawings by the beautiful art of Engraving, produced a radiance of knowledge which has secured the human race from those horrid shocks of Gothicism, which overran Greece and the Roman empire.[82]

And likewise to the Hon. Levi Woodbury of New Hampshire, as to others who accepted the Baconian interpretation of history, printing, gunpowder and the magnetic needle constituted the three pillars of the brave new world.[83]

Possessors of such faith were not to be discomfited even by so vigorous an antagonist as Thomas Carlyle. When his "Signs of the Times" appeared in the Edinburgh Review (1829), denouncing this "mechanical age" as

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[82]III, 1. A somewhat premature judgment, this. They have not (the added improvement of photo-engraving notwithstanding) even secured the human race from the shocks of the tabloid newspaper and the pulp magazine. But of course it would be too much to expect a writer of the 1830's flushed with the 'dawn of empire's' sun to have anticipated the still vaster potentialities of these arts.

[83]"Importance of Science in the Arts (1831)," Writings (Boston, 1852), III, 17-18.

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> mechanizing man, ... hedging him in with the finite and the superficial, and making him lose sight of the Infinite, the profounder mysteries of the cosmos,[84]

Timothy Walker in the North American Review rallied to the defense of Baconianism, attacked the Edinburgh Review's "brilliant writer" as one who "conjured up phantoms for the sake of laying them again." Walker not only denies "the evil tendencies of Mechanism," but he also doubts "the good influences of Mysticism." What evil can result from the power conferred by "Mechanism" upon man? Where nature

> denied us rivers, Mechanism has supplied them. Where she left our planet uncomfortably rough, Mechanism has applied the roller. Where her mountains have been found in the way, Mechanism has boldly levelled or cut through them. Even the ocean, by which she thought to have parted her quarrelsome children, Mechanism has encouraged them to step across.

"But where is the harm and danger of this?" he asks.

> Setting existing facts aside, and reasoning in the abstract, what is the fair conclusion? To our view, directly the contrary. We maintain, that the more work we can compel inert matter to do for us, the better will it be for our minds, because the more time shall we have to attend to them. Consequently, in the absolute perfection of machinery, were that attainable, we might realize the absolute perfection of mind. In other words, if machines could be so improved and multiplied, that all our corporeal necessities could be entirely gratified, without the intervention of human labor, there

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[84]"Defence of Mechanical Philosophy," N. Am. Rev., XXXIII (1831), 122.

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> would be nothing to hinder all mankind from becoming philosophers, poets, and votaries of art. The whole time and thought of the human race could be given to inward culture, to spiritual advancement.

Not that such a perfect state will ever be realized, Walker concedes; but it is enough that we can be certain that "an approach thereto ... is constantly making."[85] And surely man is like unto a god in the very power he possesses to construct a machine. "Examine the endless varieties of machinery which man has created," he suggests.

> Mark how all the complicated movements co-operate, in beautiful concert, to produce the desired result. Before we conclude that man's dignity is depreciated in the contrivance and use of this machinery, let us remember, that a precisely analogous course of reasoning must conduct us to the conclusion, that the act of Creation subtracted from the glory of the Creator....[86]

Also believing that "intellectual improvement" is dependent upon the power of the machine, Francis Wayland denounced as "puerile" all prejudice "against the use of labor-saving" inventions. "As increased productiveness affords more abundant leisure," he contended in his Political Economy,

> improvement advances. As soon again, as, by improved intellectual power, man begins to discover and apply the laws of nature, a vast

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[85] Op. cit., 123-124.

[86] Ibid., 126.

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> accession is made to the power of human productiveness. Henceforth, these two forces conspire to assist each other. Increased productiveness allows for increased time for investigation, discovery, and invention; and discovery and invention increase the power of productiveness. The more actively these act and re-act upon each other, the more rapid is the progress of society, and the more rapidly accelerated is the movement of civilization.[87]

Linked as it was with practical matters of national concern, with canals, railroads, commerce and industry, the Baconian spirit[88] penetrated high and influential places. President John Quincy Adams in his "lighthouse of the sky" message to Congress (1825) urged that the question of internal improvements be viewed in its broader aspects as related to the progress of humanity. "The great object of the institution of civil governments," he declared, joining political theory to the Promethean theme, "is the improvement of the condition of those who are parties to the social compact." And towards this object, "roads and canals, by multiplying and facilitating the communications and intercourse between distant regions and multitudes of men, are among the most important means. Education, true, is the

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[87](3d edition, Boston, 1840), pp. 108-109. According to the preface, this work contained, "in substance," the lectures in political economy that had been delivered by Wayland "for some years past" to the seniors of Brown.

[88]An illustrative piece of jubilation, linking Bacon, progress and 'internal improvement,' is "The Spirit of the Age," Knickerbocker Magazine, VIII (1836), 187-195.

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foundation of "moral, political and intellectual improvement." But it is "those parts of knowledge" that subserve the practical needs of society to which the attention of the legislators is chiefly directed--"particularly to geographical and astronomical science."[89] In his Fourth of July oration at Newburyport in 1837 he fully affirmed his belief that progress is dependent upon the kind of knowledge that has "made large additions to the physical powers of man."[90]

Sharing the same general opinion, Governor Woodbury of New Hampshire suggested in his message in 1823 that the state's legislature assign one of the public buildings in the capital for a permanent exhibit of "inventions of a useful character."[91] Through the years of an active public career, Woodbury earnestly spread the Baconian gospel, encouraged the promotion of science, urged a dedication of

> heart and hand, to enlarging its boundaries, as well as making new improvements by its agency, in agriculture, and the arts, commerce, manufactures, and all which pertains to human progress.[92]

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[89] Compilation of the Messages and Papers of the Presidents 1789-1897, ed. James D. Richardson (Washington: Government Printing Office, 1896), II, 311-314.

[90] Oration Delivered before the Inhabitants of the Town of Newburyport, at Their Request, on ... July 4th, 1837 (Newburyport, Mass., 1837), p. 57.

[91] Op. cit., I, 468-469.

[92] "On the Promotion and Uses of Science (1845)," Writings, III, 26. Delivered before the National Institute in the House of Representatives at Washington.

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Past achievements in science and technology teach us our duty--to encourage still more science and technology:

> nothing should be spared to value science as she deserves, by honoring her votaries in those ways compatible with our institutions, after examples elsewhere so auspicious in the cases of the Rumfords, and Jenners, and Davys, and Arkwrights.[93]

The addresses of Governor Clinton, as well as his labors in behalf of the Erie Canal, bear witness to his faith in science and technology as the instruments of social progress.[94] And no less a figure than Daniel Webster informed the nation that, although science and technology had already made man "like a god," further progress for society might still be expected. "We know not to what yet unthought of heights," he observed,

> the power of man over the agencies of nature may be carried. We only know that the last half-century has witnessed an amazingly accelerated progress ... and that, at the present moment, science and art are acting together ... with the most happy and striking results.[95]

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[93]"On the Promotion and Uses of Science," 40-42.

[94]Life and Writings, ed. W. W. Campbell (New York, 1849), pp. 329-363. Clinton's interest in science and the arts is everywhere evident in his gubernatorial addresses. Cf. State of New York; Messages from the Governors..., ed. Charles Z. Lincoln (Albany, 1909), II (1777-1822), 901-902, 1007-1013, 1094-1095; III (1823-1842), 118-120, 127-128, 203-205.

[95]Writings and Speeches, II, 31.

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Calhoun, too, was heard adding his voice to the general Baconian chorus. As a shield of Southern interests he opposed the protectionists, certainly; but not as an "enemy to the manufacturing interest."[96] On the contrary.

> So far from being an opponent to manufacturing industry, there is not one within the reach of my voice, who puts a higher estimate on those arts, mechanical and chemical, by which matter is subjected to the dominion of mind. I regard them as the very basis of civilization, and the principal means designed by Providence for the future progress and improvement of our race. They will be found in progress to react on the moral and political world,--thereby producing greater and more salutary changes in both, than all other causes combined.[97]

And of course many a lesser figure during this period was expressing similar sentiments. There were contributors to the North American Review such as G. W. Featherstonhaugh exclaiming that "it is to the great book of nature, that we owe most of those triumphs which reason has achieved";[98] and S. C. Chase expounding, in the same periodical, the moral and intellectual as well as physical "action of machinery."[99] There were the Albany Institute's Dr. Beck urging the cultivation of the sciences as the basis of man's

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[96]Works, ed. R. K. Crallé (New York, 1854-1860), IV, 183.

[97]Ibid., 103.

[98]"Geology," XXXII (1831), 472.

[99]"Effects of Machinery," XXXIV (1832), 220-246.

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progress,[100] and the president of Charleston College, South Carolina, sending the class of '36 out into the world with a reminder of the 'blessings' that have accrued to man from increased dominion over nature.[101] The list of such Baconian professions of faith could be enlarged indefinitely; but the tenor of them all may be epitomized in a few words from Dr. Godman's valedictory address to a graduating class of Rutgers medical students. The age's "wonder-working spirit of inquiry," said Dr. Godman, "increases with a rapidity and force almost incalculable." Its meliorating influence is everywhere evident; its advance

> is marked by fire and smoke, and change; but unlike the march of other conquerors, the fire and smoke is from ten thousand altars erected to the genius of improvement; the change induced is the substitution of comfort and elegance for want and suffering, of happiness and security for disquiet and danger.[102]

It was to the fulfillment of this promise that the American Journal of Science was explicitly dedicated upon its first appearance; for Silliman's introductory words emphasized the utility of such periodicals as his in demonstrating the

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[100] "Address Delivered before the Lyceum of Natural History ... March 1, 1824," in Transactions of the Albany Institute, I (1830), 137-147.

[101] Rev. Jasper Adams. Cf. "Critical Notices," N. Am. Rev., XLIII (1836), 542-543.

[102] Op. cit., 164-165.

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"intimate connexion" of science "as well with the comfort as with the intellectual and moral improvement of our species," and affirmed that science not only polishes and benefits society, but even exerts a religious influence by revealing "both supreme intelligence, and harmony and beneficence of design in THE CREATOR."[103] As we shall see, the belief that religion had found a potent ally in science, figured prominently in the Baconian argument.

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[103]"Introductory Remarks," p. 8.

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CHAPTER III

Progress, the Divine Plan

The Promethean theme represented only one, if the most prevalent, aspect of the general notion of progress: the aspect which, of course, more than any other enchanted the public mind to an exciting faith in a brave new world growing braver and newer. For much more effective than abstractions in enforcing ideas are the wonders of test tubes and the power of formidable machinery.[1] However there prevailed at the same time the general concept of progress based on philosophical considerations and involving a theory of history--a concept which, no less than the Promethean, has been an ideological factor in the Baconian drift of our culture. According to this general concept not only is the modern world superior in knowledge and hence power, but also

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[1]Thus the Literary Gazette for July 15, 1825, points out, as "testimonials of the march of improvement" in this country, that

> Canals are intersecting it in various directions, and Bridges, which, next to ships, exhibit the proudest evidence of skill in architecture, are spanning our mighty rivers ... while Steamboats, which of themselves will be sufficient to constitute an epoch in the history of man's inventions, are penetrating our territories by every navigable river which can afford them access. II, 299.

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inherently superior (and becoming increasingly so) in personal and social morality. This is not denied even by that staunch defender of the cultural contributions of antiquity, Justice Story, who is responsible for this opinion published in the North American Review:

> The great progress which has been made in mathematical and physical science during the two last centuries, has attracted the attention not only of philosophers, but men of business. So intimately indeed has this progress connected itself with the immediate wants and comforts of mankind, that it could scarcely escape the most careless observer. But the progress of moral, political, and juridicial science during the same period, though less perceptible to the common eye, is not less wonderful; and has quite as much contributed to the improvement of the human race, and to the development and security of their most important rights and interests.[2]

The spiritual advancement of man was not to be left solely to the more or less adventitious results of increased leisure and to the power of machinery to inspire thoughts of human dignity and divine goodness. The spirit of man was itself deemed progressive, and a more intrinsic interrelation conceived as existing between the progress of civilization and the progress of the soul. The pagan world had missed the elevating influence of Christianity, it was argued, whereas medieval man had been subjected to a perverted Christianity. In those benighted ages the benevolent affections were

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[2]VI (1817), 45.

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seldom if ever evinced; the status of women (sure token of the character of an age or nation) was low; knowledge was for the few as was also political power; and as knowledge was exclusive, speculative, used to benefit a small privileged group, so political power was based on false principles and used for the benefit of a small ruling class. On the other hand, the modern world had begun to experience progressive elevation under the twofold influence of scientific truth and purified Christianity, with their democratizing tendencies; these were the leavening ingredients peculiar to the age, elevating the common man and the humbler things of life, spreading philanthropy, and proceeding inevitably onward to the ultimate triumph of Christian ideals. "The process is slowly and irresistibly moving on," according to the Reverend Timothy Flint,

> whether we have generously thrown our mite into the scale of melioration, or in selfishness, ignorance and envy, withheld it.[3]

"It was not for heathen poet, nor visionary alchymist, nor infidel philosopher," said Professor Olmsted, to make

> the grand discovery, that the happy age was to be brought about by the united powers of the works and the word of God; that before such an age could arrive, not only must the intellect of man be exalted by science, and his feeble arm achieve a perfect dominion over all creation,

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[3] Op. cit., p. 407.

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> but the Bible must also exert its universal sway over the hearts of men.

And this

> Isaiah's hallowed lips first proclaimed ... a union of 'the spirit of wisdom and understanding, the spirit of counsel and might, the spirit of knowledge, and--THE FEAR OF THE LORD!'[4]

That the world should thus progress was deemed in the very nature of things; evidence was adduced from physical nature as well as from Scriptural and secular history. That "all the productions of nature are in their progress to greater perfection," declared the Port Folio in 1823, appraising the view of Erasmus Darwin, is

> an idea countenanced by modern discoveries and deductions concerning the progressive formation of the solid parts of this terraqueous globe, and consonant to the dignity of the Creator.[5]

New York's political figure, Daniel D. Barnard, speaks teleologically of the progress of human nature and of civilization as originating in Divine Will.[6] And the Honorable Levi Woodbury sees the "general proofs of this ... imbedded in every stone of the whole fabric of society."

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[4]Op. cit., p. 23.

[5]XV, 450.

[6]Discourse Pronounced at Burlington before the Literary Societies of the University of Vermont, August 1, 1838; on the Day of the Annual Commencement, Albany, 1838.

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> They are written on much of the earth, also; and, if not on the heavens and all which they contain, they beam out in the progressive knowledge of those mighty bodies which compose the solar system, and the annals of human life are full of them.[7]

The desire to 'better one's condition' became "a peculiarity implanted by the Maker in the human mind,--never to rest satisfied with its present condition."[8] From the beginning the destiny of man has sent him higher and higher, according to J. Chapman writing in the North American. Successive revolutions in human history all manifest the working out of this destiny: the advent of Christianity, the purifying by the Reformation, and the establishment of free institutions by our own Revolution for which "all past events have been preparing the way." And so at present, exults Mr. Chapman,

> we stand ... in the glorious light of freedom. The privileges of unshackled thought and action are ours, and as we go onward with a bounding step, and a laughing eye, we point to our Revolution, as the battle that was fought for them....[9]

More than one writer takes the trouble to contest the cyclical theory of history. A contributor to the Literary

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[7]"On Progress," in Writings, III, 76.

[8]R. Rantoul, op. cit., p. 248. Cf. also Charles Follen, Works, with a Memoir of His Life (Boston, 1841), V, 241-248.

[9]XXXV (1833), 418-448.

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Gazette in 1824 maintains that there is slight analogy between the material and moral worlds, and that however applicable the idea of maturity and decay may be to the history of individual nations, it can have no reference to civilization itself, constituting as it does "one great chain, whose end man cannot see, but whose beginning may be traced to God."[10] And a writer for the Southern Quarterly is certain that, since "intellectual progress is a positive law" of man's "nature," it is "impossible that the race should ever relapse into the state from which it has emerged."[11] Also animadverting on the subject, the Reverend Hedge contends that

> notwithstanding the perpetual flux and reflux which appears on the surface of things, there has been an undercurrent of improvement, coëxtensive with the whole course of time.

"There never was an age," he insists, "in which some element of humanity was not making progress."[12] This was also the conclusion of the New England educator, James G. Carter.[13] In the 'sober opinion' of Erasmus Darwin MacMaster, president

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[10] I, 218-219.

[11] I (1842), 305.

[12] Op. cit., pp. 9-10.

[13] Cf. "Carter's Address," in U.S. Rev. and Lit. Gaz., I (1826), 122-123.

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of Hanover College, God has provided in science and education the means by which is to be achieved

> the progressive improvement and perfection of man, and thereby his transformation into the image of the Omniscient and Holy Intelligence, the Father of Lights.[14]

The idea of progress could thus with facility be drawn into the strong religious current of the age, acquiring sanctity by the association, and reinforcing the morality of labor and utility as a bond between Baconian and putative Christian attitudes. In fact the notion of perfectibility, particularly as related to human nature, was an integral factor in the fundamental line of development of American religious thought in the eighteenth and nineteenth centuries.[15] As a result of such a congeries of attitudes it was possible

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[14] Discourse Delivered November 7th, 1838, on the Occasion of the Author's Inauguration as President of Hanover College, Indiana, Hanover, 1838.

[15] V. L. Parrington, Main Currents in American Thought (New York, 1930), II, 321-328.

Thus we find ministers identifying the alleged progress of civilization with spiritual progress--both being considered aspects of the same divine plan. Note, for example: William E. Channing, "The Present Age," Works, VI, 149-182; also III, 138-158; C. Follen, Works, V, 231-248, 262-265; Stephen H. Tyng, The Importance of Uniting Manual Labor with Intellectual Attainments, in a Preparation for the Ministry (Philadelphia, 1830), p. 4; Henry Ware, Jr., Works, II, 99-144; also III, 69, 94-109; Francis Wayland, Duties of an American Citizen, Two Discourses Delivered ... in Boston ... April 7, 1825, the Day of Public Fast, Boston, 1825. See also Sampson Reed, Observations on the Growth of the Mind (new edition, Boston, 1910), pp. 9-10; Samuel Eels, "Address before the Biennial Convention

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for the Baconian as well as Christian to be credited with a practical and 'improving,' which was also a pious, way of life. We can begin to see here evidence of a close association--or perhaps, better, a confusion--of religious precepts and Baconian ideas which was to increase with the further expansion of that knowledge which is power and further contraction of that knowledge which is guidance. Historically the birth of the new age of science was synchronized with the birth of the new religious era: the true road to knowledge and the true road to God were identified. When the Galileos were no longer suppressed by theological tyranny, ran the argument, the world could begin to expand intellectually as well as spiritually. And it was the Reformation, according to this view of history, that liberated men from religious despotism, making possible at the same time a free investigation of 'God's laws as they operated in all spheres, spiritual as well as physical.' In turn, the disclosure of these divine laws in all their grandeur and wisdom could be expected to act as a potent stimulus to piety. And further, there was the improved social morality which, despite temporary

[Footnote 15, contd.]

[of Alpha Delta Phi Society in 1836] at New Haven, Connecticut [on the Law and Means of Social Advancement]," in [James Eels,] Memorial of Samuel Eels (Cleveland, 1873), pp. 153-223.

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reversals, had become general under the influence of Christianity. This improved social tone provided more fertile ground for proper intellectual growth and the development of the socially useful. The pursuit of truth by the patient methods of science, and the application of that truth to the welfare of all men in a spirit equalitarian and humanitarian--these could flourish in soil prepared jointly by the spirit of Bacon and the spirit of Luther: the spirit of devotion to scientific truth and the socially 'useful' with the spirit of true Christianity--anti-hierarchic, soberly moral, philanthropic, itself truth-seeking and honoring the humble things of life. As Timothy Ford of South Carolina expressed it,

> Erasmus, Ludovicus Vives, Sir Thomas More and some others who were amongst the first to depart from the barbarism of the Schools, and to make some progress in discerning the just foundations of true philosophy, only paved the way for the more bold and decisive measures of Luther; who found that the only mode of successfully attacking the strong holds of Ecclesiastical Tyranny, was to assail the Empire of Scholastic Theology. With an intrepid spirit he advanced to attack both; and in defiance of all the terrors of the Church, drove his ploughshare over the ground beset with a rank growth of artificial philosophy and superstitious dogmas, equally inimical to chaste Religion and intellectual improvement.... He shattered the fetters in which the human mind had been enthralled; reformed in philosophy as well as in religion, and taught men to become free enquirers into the essence and foundations of both.

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And "no sooner" had these "adventured abroad with enfranchised minds into the wide fields of Nature's works," adds Ford, than there appeared Copernicus, Galileo, Kepler, Bacon, Newton, Davy and the rest.[16] "The sciences were designed to accompany the gospel," asserted the Reverend Rufus Anderson of Boston,

> and revolve about it as their governing orb. When the gospel arose from the chaotic night of the dark ages, the sciences rose with it, to heighten the splendor of this latter day, and with it they have ascended towards their zenith, all shining with beams reflected from that INFINITE SUN OF TRUTH, which animates the universe of thought. The world is to be enlightened, civilized, and made happy by the blessing of God on the combined consentaneous influence of all the truth vouchsafed to man, through the medium of creation, inspiration, and providence.[17]

According to Thomas Grimké, the rise of science and the useful arts gave man the means only, but the Reformation provided the will to serve the interests of society, and to advance the condition of the race.[18] In the opinion of others, science and the useful arts gave greater scope and

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[16] Address Delivered before the Literary and Philosophical Society, of South-Carolina, on the 19th of November, 1817, on Physical Science, and Particularly the Science of Chemistry (Charleston, 1818), pp. 5-7.

[17] "Importance of Teaching Science to the Heathen in Connection with Christianity," Amer. Quar. Observer, II (1834), 33.

[18] "An Address on the Character and Objects of Science (1823)," Reflections on the Character and Objects of All Science and Literature (New Haven, 1831), pp. 21-47.

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effectiveness to religion itself. Thus James Renwick agreed that, in our own day,

> the extension of science and the arts ... is preparing the way for the triumphs of revealed religion, while their general diffusion appears to be one of the most important means employed by the Deity to effect the accomplishment of the sublime predictions of the gospel.[19]

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[19]"Lecture at the New-York Atheneum," N.Y. Review and Atheneum, II (1825-6), 106.

According to James Gould the Reformation itself had to wait upon the new intellectual impulse of the Renaissance:

> When science and literature had been re-established, upon an immovable foundation; when the inventions of the mariner's compass, of paper, and of the art of printing, had opened innumerable channels, before unknown, for the circulation of knowledge; when the discovery of India, and the Western continent, had given an impulse, almost universal, to the spirit of enterprize and inquiry; then, and not till then, did the Reformation burst upon the Christian world.
>
> Oration, Pronounced at New-Haven, before the ... Phi Beta Kappa Society (New Haven, 1825), p. 20.

Cf. also J. Farrar, "Learned Societies," N. Am. Rev., VIII (1818), 157-160, wherein is expressed the view that the influence of Christianity was strengthened and purified with the aid of science and utilitarianism. And there is W. R. Johnson's opinion that "the increasing lights which science, imperfectly applied, had shed upon the condition of social life, prepared the way for the more perfect philosophical day." "On Schools of the Arts," American Institute of Instruction Lectures, 1835 (Boston, 1836), 273-277. The Reformation and the diffusion of useful knowledge are seen by Robert Rantoul, Jr. (op. cit., pp. 86-91) as jointly responsible for modern advancement. Francis Wayland argues

> that to revealed religion we owe that state of civilization in which alone such sciences can

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American descendants of militant Protestant ancestry thus readily linked the Reformation with the rise of science and technology, and ascribed to them jointly the blessings of "an age peculiarly distinguished for freedom of thought, and vigor and intensity of action"--an age "emphatically ... of physical skill, of moral and mental enterprize, and of active and extended benevolence."[20] There was no question in their minds but that the present transcended all past ages. Could they not point to a proper estimation and more extensive possession of knowledge, and a higher social morality in which the spirit of philanthropy

[Footnote 19, contd.]

> exist as renders the laws of nature instruments available to the production of the happiness of man.
>
> A Discourse Delivered at the Dedication of Manning Hall, ... February 4, 1835 (Providence, 1835), p. 31.

And Dr. Frederick Hall (principal of Mount Hope Literary and Scientific Institution, near Baltimore):

> [Chemistry] has been an assiduous co-operator with its sister sciences, and with Christianity, in elevating the character of civilized nations to the high stand it now holds....
>
> An Oration on the Importance of Cultivating the Sciences: Delivered at Dartmouth College, before the New Hampshire Alpha of the Phi Beta Kappa, August 21, 1828 (Baltimore, 1828), p. 13.

Thus we find man's material progress bound with religion to his spiritual progress. See also footnote 15, ante.

[20] G. Kent, Characteristics and Claims of the Age in which We Live, an Oration Pronounced at Dartmouth College, August 23, 1832, before the New-Hampshire Alpha of the Phi Beta Kappa Society (Concord, 1832), p. 4.

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was active as never before, diffusing light and comfort? Could they not point to countless missions, Bible societies and peace societies, to Sunday schools, family libraries, lyceums and mechanics' institutions, to the steam engine and improved heating arrangements for the home and to the supernal morality of Sir Walter Scott and Maria Edgeworth?[21] Certainly, it was felt, antiquity could boast of nothing like these.

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[21]See Appendix II, p. iii.

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CHAPTER IV

"Westward the Course"

The idea of progress could be reinforced in America by vivid firsthand experience. To a pioneer people the 'conquest of nature' was no mere figure of speech or test-tube abstraction. And under the circumstances the Baconian point of view became more than a doctrine; it was a necessity. Before America's eyes the western barriers to the brave new world were receding, and the useful arts, increasingly effective in their alliance with advancing scientific learning, were indispensable in the process. America was impressed by its achievement in gaining "empire over Creation."[1] Indeed what could be more impressive than to find with Walter Johnson, "districts of country where yesterday, the first crash of the falling forest was heard, today the voice of science" rising "from the walls of her neat and classic habitation; and where within the memory of the present generation the shrieking matron was torn from her infant daughter by the northern savage," this same daughter

> now, amidst scenes of comfort and elegance, storing her mind with every solid and useful accomplishment, and possibly ... by her side,

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[1]Cf. Novum Organum, II, lii.

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> the daughter of that very savage, an ardent but generous rival in the same ennobling employment.[2]

The assembled pupils and guests at the opening of Haverhill Academy sang of "Christian Temples" and of "spacious buildings, rich and good,"

> Where Indian huts and wigwams stood.[3]

Distinguished citizens of the comparatively long-settled East, called upon to laud their neighbors and the nation's fathers, would reflect how "it was but two centuries, since the rude savage" haunted the land where now one could see "churches consecrated to the true God, and surrounded by splendid dwellings, ... cultivated fields," and rivers "spanned with bridges, and fringed with the masts of commerce."[4] And an elementary history of the United States

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[2] Observations on the Improvement of Seminaries of Learning in the United States: with Suggestions for its Accomplishment (Philadelphia, 1825), pp. 12-13.

[3] "Order of Services, at the Opening of Haverhill Academy, April 30, 1827," contained in T. F. Currier, A Bibliography of John Greenleaf Whittier (Harvard University Press, 1937), facing page 10. The preceding stanzas seemed to suggest the importance of "useful science." These are the closing lines:

> Let wisdom in these walls preside,
> And useful science grow,
> While Merrimac shall roll its tide,
> Or Ocean ebb and flow.

On this occasion were also sung, to the air of "Pillar of Glory," stanzas by the young Whittier, which began with the line,

> "Hail, Star of Science! come forth in thy splendor."

[4] L. Woodbury, Writings, I, 476; III, 9; O. Dewey, op. cit., pp. 285-286.

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informed schoolboys that "eighty years since, where Baltimore now stands, there were not ten dwelling houses."[5]

It was, however, the opening West that currently presented a living pageant of the progress of civilization. Daniel Webster, standing in the midst of the people of St. Louis in 1837, declared that he found "cheering beyond expression ... the anticipations of futurity" vouchsafed by America's westward advance. "When we reflect how recent," he exclaimed,

> how very recent, has been the day when St. Louis began to rank itself among the cities of our land, we are amazed. How little could have been anticipated of all this from the wilderness which, but a few short years since, was howling here. How little could the most sanguine temperament have looked forward to an hour like this. Where once was a wilderness, I have beheld the comforts, the luxuries, the refinements of polished existence. Who shall speak, then, the prospect of glory for the future?[6]

To Everett the winning of the West was more than a physical triumph, more than "the progress of its citizens in numerical multiplication."

> It is civilization personified and embodied, going forth to take possession of the land. It is the principle of our institutions, advancing

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[5][Charles Prentiss,] History of the United States of America; with a Brief Account of Some of the Principal Empires and States of Ancient and Modern Times, for the Use of Schools and Families (2d edition, Keene, N.H., 1821), p. 14.

[6]Writings and Speeches, XIII, 79-80.

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> not so much with the toilsome movement of human agency, but rather like the grand operations of sovereign Providence. It seems urged along its stupendous course, as the earth itself is propelled in its orbit, silent and calm, like the moving planet, with a speed we cannot measure; yet not, like that, without a monument to mark its way through the vacant regions of space, but scattering hamlets, and villages, and cities on its path,--the abodes of civilized and prosperous millions.[7]

Thus Everett conceives of America's progress as operative with something of the inevitability of natural law. Almost cosmic significance accrues to her "remarkable" internal improvements: her canals, highways and railroads so rapidly extending the light of civilization.[8]

The same sort of enthusiastic acclamation of the nation's growth, with the same enraptured mingling of physical and spiritual, marked a myriad other patriotic exercises. The aged Lafayette was welcomed back to America with florid declamations in which the country lying before him was contrasted with the struggling colonies that he knew in Revolutionary days.[9] William Leggett, the New York journalist,

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[7]"Speech at the Yellow Springs, in Ohio ..., on the 29th of June, 1829," in Orations, I, 210.

[8]Ibid., pp. 208-209, 212-213.

[9]Cf. William Gibbes Hunt, quoted in U.S. Lit. Gaz., II (1825), 353; Samuel Woodworth, "Progress of Improvement," in Melodies, Duets, Trios, Songs, and Ballads, Pastoral, Amatory, Sentimental, Patriotic, Religious, and Miscellaneous, Together with Metrical Epistles, Tales and Recitations (third edition, New York, 1831), pp. 124-125 (not in Poetical Works, New York, 1861, already cited); Woodbury's address to Lafayette at Boston, in Writings, I, 535.

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marvelled expressly at the rapid development of the Mississippi Valley, "where, a few years ago, the solitary smoke of the red man's wigwam, etc., etc."[10] Timothy Flint expressed admiration at the growth of Cincinnati.[11] At the sight of busy piers at Buffalo, Willis Gaylord Clark was deeply stirred by the thought of how swiftly the wilderness had given way to civilization "with the hiss of its rail-road engines, the thunders of its steaming apparatus, and

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[10]Leggett, "The Block-House," in Tales of Glauber-Spa, by Several American Authors (New York, 1832), II, 8.

[11]Flint, "Progress of the West," Western Monthly Review, I (1827), 25. Internal autobiographical evidence points to Flint's authorship. An article lauding the advances made by Cincinnati in educational facilities, manufacturing and the amenities of life appeared in the same issue: "Cincinnati in 1826," pp. 61-66. In his Recollections of the Last Ten Years (Boston, 1826), p. 324, Flint also demonstrates his responsiveness to signs of 'cultural' progress in America. Speaking of the inhabitants of Louisiana, he writes:

> It is true that there are opulent French planters, reared in the simplicity of the early periods of Louisiana, who can neither read nor write. I have visited more than one such. But it is also true, that the improving spirit of the age, the rapid communication by steam-boats, which brings all the luxuries, comforts, and instructions of society immediately to their doors, is diffusing among the planters a thirst for information, an earnest desire that their children should have all the advantages of the improved modes of present instruction.

Flint himself, it should be noted, was devoted to the labor of bringing religion and culture to the then frontier.

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the rolling of the triumphant wheels of commerce; and it seemed to him "that in these western regions the soul of man" glowed

> with a newer fire, and fresher impulse; as if some Indian Prometheus, seeing the decay of the Red Nations, had sent a fervent spirit into the bosoms of their white successors.[12]

And when the muse descended among the Susquehanna hills to bring forth The Harp of the Back Woods by one, Mrs. Turner, the imagination of the Port Folio's editor was stirred by the thought that

> many of the pieces were composed in a district of country, where, a few years ago, we

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[12] Literary Remains, Including the Ollapodiana Papers, the Spirit of Life, and a Selection from his Various Prose and Poetical Writings, ed. Lewis G. Clark (New York, 1844), pp. 152-153. The vivid impression of America's "tide of power" inspired this burst of enthusiasm (loc. cit.):

> A word here in the reader's ear. If thou goest to Buffalo, ascend thee to the dome of the American, and cast thine eyes southward. There, league on league, stretches the blue and primeval wilderness, and from the wigwams of the Senecas the smokes go up, as in the days when the whole forest was their dominion, and the Pale Faces feeble and few. Look then around you. Magic is there! The tide of power, rising and rolling onward, sends its roar to your ear; and you see the progress of that mighty flood of enterprise which is yet to fill the West with a noble and prosperous people.... Yes, my glorious country! every additional mile I traverse of thy boundaries, adds to the flame of my attachment. Filled with a brave and generous people, who have done more in the same space of time than any nation ever did to promote the honor and liberty of man--I love thee!

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> roamed through a solitary and unbroken wilderness--where the axe of the woodman had never been heard.[13]

The sentimental Irving may have complained in 1839, that "the spell of Sleepy Hollow" had been broken by "the boasted march of intellect," or rather by "the all-pervading influence of steam";[14] but to a sturdy Baconian such as the father of the Lancasterian System, the sight of an America mastering the new agents of power meant only tremendous potentiality for human good. "Perhaps the brightest page of American history," he writes in an open letter to his American friends (1819),

> yet remains blank for Americans to fill, with such vivifying characters as shall, with equal perspicuity and brilliancy, prove to the nations of the world in the full force of demonstration, that 'knowledge is power.'[15]

There was a great fondness for quoting "Westward the course of Empire" in those days--with added connotations of

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[13]XIII (1822), 439. For still other expressions of the same theme, see U.S. Literary Gazette, II (1825), 298; Robert Bruce, "Popular Improvement," an extract from his address before the Pittsburgh Philosophical Society, July 3, 1828, quoted in AJE, III (1828), 626; C. J. Ingersoll, Discourse Delivered before the Society for the Commemoration of the Landing of William Penn, on the 24th of October, 1825 (Philadelphia, 1825), p. 9.

[14]"Sleepy Hollow," in Biographies and Miscellanies, Hudson Edition, ed. Pierre M. Irving (New York, 1866), p. 512. Originally in the Knickerbocker Magazine, XIII (1839), 404-411.

[15]Joseph Lancaster, "National Institutions," in Letters on National Subjects (Washington City, 1820), p. 3. The letter was addressed "to Burwell Bassett, and the Friends of American Education, Norfolk, Virginia, 11th Month, 20th, 1819."

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vast significance for America's alleged rôle in history. For the young nation was conscious of a high destiny in leading the world forward in the progressive emancipation of man politically, intellectually, spiritually. She was expected to prove herself something in the nature of an avatar of Prometheus combined with the spirits of Calvin, Luther, Cromwell and Hampden,[16] becoming thereby a pillar of cloud and of fire to the world. Her religious foundations, her provisions for popular education and her Revolution were all tokens of her leadership in man's progress to the new Canaan. "God has set us on high, for an example," proclaimed one writer in the Journal of Education.[17] After all, was she not

> free from those hereditary institutions by which other nations are enthralled, and held back, and allied to the ignorance and vices of their progenitors?[18]

Even though admitting some anxiety concerning the preservation

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[16]"Calvin and Luther had taught our fathers how to think in matters of religion; Cromwell and Hampden instructed them how to act as well as think, and in politics no less than religion, and Sidney soon showed them how to die for the former, when need be, as Rogers had for the latter." Levi Woodbury, "On some of the Peculiar Traits of American Character" (an address delivered before the New Hampshire Historical Society, June, 1845), in Writings, III, 200.

[17]I (1826), 158.

[18]N. Am. Rev., VI (1818), 237.

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of her blessings, William Sullivan, perennial writer of schoolbooks, finds in his heart no doubt of the "eminent superiority" of American institutions--"the wisest that have been devised."[19] And Thomas Grimké argued that

> in every department of knowledge, whether theoretical or practical, where THINKING and REASONING are the means and the criterion of excellence, our country must, IF THERE BE TRUTH AND POWER IN THE PRINCIPLES OF THE REFORMATION, surpass every people that ever existed.[20]

"It was the vain boast of Archimedes," asserted a speaker before the American Institute of Instruction in 1831,

> that if he had a station on which to rest his lever, he could move the world. Our country is the station, from which the world has been already moved by a moral power unknown to Archimedes.[21]

"Here was offered the opportunity," wrote Samuel Knapp in his Lectures on American Literature, "to cultivate the mind without the trammels and fetters which embarrass and bind those born in aged and decaying communities."[22] What if our

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[19]Discourse Delivered before the Pilgrim Society, at Plymouth, on the Twenty Second Day of December, 1829 (Boston, 1830), pp. 13-14.

[20]"Address on the Character and Objects of Science ... Delibered in the First Presbyterian Church, at Charleston, on Wednesday the 9th of May, 1827," in Reflections on the Character and Objects of all Science and Literature, and on the Relative Excellence and Value of Religious and Secular Education, and of Sacred and Classical Literature (Charleston, S.C., 1831), p. 45. The excited typography is Grimké's.

[21]Stephen C. Phillips, op. cit., p. 99.

[22](New York, 1829), p. 37. It should be noted that this same nationalistic spirit motivated demands for a native American literature--a literature no longer slavishly imitative of the Old World's. Knapp's American Literature contains only one of innumerable such expressions of nationalism. See his preface.

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nation be inferior in the 'arts that adorn,' Henry Wheaton argues; she has nevertheless provided a model for the world, of beneficent government, humane laws and popular education.[23] Her Declaration of Independence, according to another orator, far surpasses even Magna Charta as an aegis of liberty; for the American document represents no mere crumbs of concession forcibly extracted from an earthly monarch, but

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[23] Op. cit., pp. 8-13.

In Cora, or the Genius of America, a fulsomely sentimental novel of the period (Philadelphia, 1828), we find the heroine exclaiming (pp. 20-22):

> It is indeed true, that your country does not present to the traveller, those classic associations, which render older countries so interesting to the curious scholar, and to the romantic lover of traditionary lore; and you have no mouldering edifices, rendered sacred by antiquity; no temples that have stood for centuries, chef d'oeuvres of human art; ... but the simple name of Washington, is for you, a monument of unfading and eternal glory, which sheds its fame and splendour, as well as its inspiring influence, over the whole nation; it is engraved on the pillars of a free country, and on the hearts of millions of happy people, and it is as proud a monument for America, as the Parthenon for Greece, or the Coliseum for Rome! That, is not the effort of genius, mingled with the imperfections of art, and subject to the influence of time and events, but it is Genius herself, enduring and eternal!

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> a DECLARATION, by a whole people, of what before existed, and will always exist, the native equality of the human race, as the true foundation of all political, of all human institutions. It was an ASSERTION, that we all hold our rights, as we hold our existence by no charter, except from the KING OF KINGS. It vindicated the dignity of our nature.[24]

Thus emerges the fusion of Hebraic and equalitarian gospels which it was widely felt America's peculiar destiny to reveal. America has been the chosen scene of an experiment for which "the history of the last two centuries" has been the "preparation," according to the Literary Gazette for April 15, 1824--an experiment to prove

> whether men might be governed by law made by them and for them, instead of the fluctuating and arbitrary pleasure or passion of an individual or a mob.[25]

And now that the experiment has been productive of its "great result," it is America's duty to proclaim the lesson of freedom and order which the world "cannot so well learn without our aid."[26] "Our destiny, our duty, and our success, are ... adumbrated by our history," exclaims a writer for the American

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[24] Peleg Sprague, extract from an eulogy on John Adams and Thomas Jefferson delivered July, 1826, at Hallowell, Augusta and Gardiner, Maine, quoted in U.S. Rev. and Lit. Gaz., I (1826), 33-34.

[25] "Thoughts upon the Character of the Age," I, 29-31.

[26] Ibid., 30. The theme is continued in greater detail in a second installment of the same article in the issue of May 15, 1824, pp. 42-44.

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Quarterly.[27] In Faneuil Hall, paying tribute to the recently deceased Adams and Jefferson, the moving voice of Daniel Webster was heard declaring this an era

> distinguished by free representative governments, by a newly awakened and an unconquerable spirit of free inquiry, and by a diffusion of knowledge through the community, such as has been before altogether unknown and unheard of.

And to this new spirit of the age America's very life is bound. "America, America"--and the great orator's charged voice must have sent a tremor through his audience--

> our country, fellow-citizens, our own dear and native land, is inseparably connected, fast bound up, in fortune and by fate, with these great interests. If they fall, we fall with them; if they stand, it will be because we have maintained them.[28]

The Fourth of July orators readily turned to the inspiring themes of American progress and superiority.[29] "I would not, for I need not, use the language of inflation," the banker-poet Charles Sprague assured his fellow-Bostonians on Independence Day, 1825;

> but the degree has gone forth; and as sure as the blue arch of creation is in beauty above

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[27] V (1829), 99.

[28] Writings and Speeches, I, 324; II, 74.

[29] Cf. review of Fourth of July orations "superior to the common cast" in U.S. Lit. Gaz., IV (1826), 421-431; William Slade, An Oration Pronounced at Bridport, July 4, 1829, Middlebury, Vt., 1829; also the article, "Liberty," in the Christian Examiner, VII (1829), 1-21.

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> us, so sure will it span the mightiest dominion that ever shook the earth. Imagination cannot outstrip reality, when it contemplates our destinies as a people. Where nature slept in her solitary loveliness, villages, and cities, and states, have smiled into being. A gigantic nation has been born. Labor and art are adorning, and science is exalting, the land that religion sanctified, and liberty redeemed.[30]

"Resolutely developing her resources and perfecting her establishments by the light of her own experience," declared George Bancroft at Northampton's celebration of Independence Day (1826),

> she stands in the eye of heaven and the world in all the comeliness and strength of youth, yet swayed by a spirit of mature wisdom, exemplifying in her public capacity the virtues and generous affections of human nature, a light to the world, an example to those who would be free, already the benefactress to humanity, the tutelary angel of liberty.[31]

And at the same time in Boston the learned Josiah Quincy

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[30]"Oration Delivered July 4, 1825, in Commemoration of American Independence, before the Supreme Executive of the Commonwealth, and the City Council and Inhabitants of the City of Boston," in Eloquence of the United States, compiled by E. B. Williston (Middletown, Conn., 1827), V, 339.

On this same day at Auburn, N.Y., William Seward was declaring that not even "the most visionary enthusiast" of the Revolution could have anticipated the rate of America's westward expansion. And thereupon we have another allusion to flourishing cities where once only the Indian hunter roamed, and to steamboats on lakes where once only the bark canoe made its silent way. Works (New York, 1853), III, 193.

[31]Quoted in U.S. Lit. Gaz., IV (1826), 430.

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was proclaiming that "under Providence" the American Revolution

> has been the chief, if not the sole cause of that impulse to the human mind, which, during the last half century, has changed the face of Europe and elevated the hope of man.

With this influence, according to Quincy,

> knowledge has been increased and diffused; the rights of man vindicated, a free intercourse of commerce, science and arts, introduced on both sides of the Atlantic, unparalleled in human history; and giving promise of an advancement in freedom, morals, and refinement, exceeding the hope, or conception, of former times.[32]

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[32] Oration Delivered on Tuesday, the Fourth of July, 1826, It Being the Fiftieth Anniversary of American Independence, before the Supreme Executive of the Commonwealth, and the City Council and Inhabitants of the City of Boston (Boston, 1826), pp. 22-23.

Quincy contributed to the large number of orations of the period, extolling the virtues of the Founding Fathers. Representative of the spirit of them all is this passage from Quincy's Address to the Citizens of Boston on the XVIIth of September, MDCCCXXX, the Close of the Second Century from the First Settlement of the City (Boston, 1830), pp. 9-10:

> Right conceptions then of the glory of our ancestors are alone to be attained by analyzing their virtues. These virtues, indeed, are not seen charactered in breathing bronze, or in living marble. Our ancestors have left no Corinthian temples on our hills, no Gothic cathedrals on our plains, no proud pyramid, no storied obelisk, in our cities. But mind is there. Sagacious enterprise is there. An active, vigorous, intelligent, moral population throng our cities, and predominate in our fields; man, patient of labor, submissive to law, respectful to authority, regardful of right, faithful to liberty. These are the monuments of our ancestors.

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Persistently on the Fourth of July, as well as on other occasions, Edward Everett pointed with pride, not only to America's 'astonishing strides in commerce, agriculture, the arts and sciences,'[33] but also to her rôle as "the beacon of the world," guiding other nations along the true path of social melioration.[34] In his Phi Beta Kappa oration at Cambridge in 1824 he lauds the nation's achievement of "a new form of political society," far superior to any in the past; and quoting Bishop Berkely, he hails America as the final "act," "Time's noblest offspring" in the "westward course of Empire."[35] And when, on Independence Day, 1837, John Quincy Adams arose before the people of Newburyport, it was to depict America in the vanguard of a world steadily improving towards the more perfect fulfillment of the promise of Christianity: the promise of a social order for all men, of the kind foreshadowed in the Declaration of Independence--an order in harmony with the laws of nature and of

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[33] "In our own country, the burden of every speech, from that of the chief magistrate at his inauguration, down to that of the magniloquent stripling, who first tries his pinions on a sunny Fourth of July, is 'internal improvement.'" W. R. Johnson, Observations on Improvement of Seminaries of Learning (Philadelphia, 1825), p. 6.

[34] "Fourth of July at Lowell, an Oration Delivered ... the 5th of July, 1830," in Orations, II, 47-66. See also ibid., I, 103-130, 150-172.

[35] Ibid., I, 12-15, 37-41.

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nature's God.[36]

It was everywhere felt that "the eyes of the world" were "fixed upon the citizens of the young republic." As one writer in the Democratic Review expressed it:

> To us much has been given, and much will be required of us. We have been placed in the forefront of the battle, in the cause of Man against the powers of evil which have so long crushed him to the dust. The problem of his capacity for self-government is to be solved here. Our mission is to elevate him to a sense of his native dignity, and to prove that in the great social interest of religion, and, to a much greater extent than has been believed, in all his relations, he should be left to the individual action of his own will and conscience. Let us but establish this, and the race will have made an advance from which nothing short of the hand of Omnipotence can force it to recede. To no other has been committed the ark of man's hopes, and it remains to be seen whether we will faint by the way or bear it on in triumph. Surely we cannot fail of success in such a cause! Surely we cannot falter when so much depends upon our perseverance to the end![37]

"Cold must be that man's heart," exclaimed the Reverend George Burnap of Maryland, after hailing the mechanic arts

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[36] Oration Delivered before the Inhabitants of the Town of Newburyport, pp. 57-64.

Some years previously (1823) he had written to Charles Ingersoll admitting that America could not boast superiority to older nations in literature, science and art, but insisting upon her achievement of an unexcelled social order. "Our great superiority," he had written Ingersoll, "is in political science, government and political morality." Writings, ed. Worthington C. Ford (New York, 1917), VII, 487-488.

[37] "The Progress of Society," U.S. Mag. and Democ. Rev., VIII (1840), 87.

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as the basis of human progress, and American precedence in the 'march of mind,'

> dead must be that American's patriotism, who, without emotion, can take the view which we have imperfectly sketched out of the essential means of human progress, and find them all in unsurpassed abundance in that country which he proudly calls his home. He may be excused if in a moment of enthusiasm he adopts as almost prophetic the sentiment of one of the choicest spirits of our mother land, when he exclaimed--
>
> 'Westward the star of empire takes its way,
> The four first acts already past,
> The fifth shall close the drama with the day;
> Time's noblest offspring is the last.'[38]

America, then, was more than a mere participant in the progress of the human race, according to such evolutionary optimists as Burnap. She was, indeed, the avant-garde of that progress, destined to attain to unprecedented development as a nation of free men. As might be expected, such a belief entailed the imposition of a duty upon each citizen to further the cause of progress.[39] And since technological advance was considered a principal factor in human improvement, faith in science and in the industrial arts became

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[38]"Progress and Achievement of the Mechanic Arts" (an address before the Maryland Academy of Science and Literature), in Lectures to Young Men, on the Cultivation of the Mind, the Formation of Character, and the Conduct of Life (2d ed., Baltimore, 1841), p. 224. Berkeley's lines are, of course, misquoted by this worthy clergyman.

[39]Cf. Webster, Writings and Speeches, I, 324, urging America to "discharge all the duties" imposed by leadership.

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linked in countless ways with social thought rooted in the preconceptions of humanitarianism. The social obligation imposed was, it should be noted, deemed more than compatible with individualist economics and adequately dischargeable by adding one's own contribution, however small, to the sum total of practical knowledge--in accord with the Baconian ideal. Bearing in mind the existence of this pressure of social circumstance and conviction, we can the more readily understand the rapid dissolution of what did exist in America of the classical humanist tradition, and concomitantly the increasing sociological and technological bias of education. A brave new world, with brave new needs and ideals, demanded a brave new education. And were we not the bravest of the brave? Should we not, then, energetically promote the cause of science and industry, which is likewise the cause of humanity?

> Let us cultivate, and vindicate, and perpetuate this country, not only by the powers and sympathies of heroic exploits, but by the nobler attractions of all the arts of peace.

So urged Ingersoll in 1825, adding:

> Ours is the country of principles, not place: where the domestic virtues reign, in union with the rights of man.... It sends to all benighted quarters of the globe, the mild but divine radiance of an irresistible example.[40]

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[40] *Commemoration of the Landing of William Penn*, pp. 35-36.

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"We have launched our national bark," declared Griscom,

> upon the stream of ages, under serener skies, and with fairer gales, than ever blessed the dawn of any of our predecessors in history.... Our happiness and the happiness of unborn millions, is to a great extent, dependent on the wisdom of the present age. It is no wonder then, that the attention of the civilized world is turned upon us, and that all our doings should be noticed with scrupulous curiosity and anxious hope.[41]

This is a chosen people in the onward march of man under the light of Christianity, according to the Reverend Nathan Sidney Smith Beman:

> The moral power of the country and its institutions, must be felt to the very limits of the earth, and extend to the last generation of our race.[42]

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[41] Discourse on Character and Education, p. 15.

[42] An Oration, Pronounced at Middlebury, before the Associated Alumni of the College, on the Evening of Commencement, August 17th, 1825 (Troy, 1825), p. 39. Caleb Atwater, assuming as a patriotic duty the labor of writing on education, warned his fellow Americans:

> Extinguish the lamp of freedom in our country, and all the lights of liberty now burning in Europe, may also be immediately extinguished on that continent.
>
> An Essay on Education (Cincinnati, 1841), p. 13.

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CHAPTER V

The Brave New World Measures Itself Against the Past

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Exulting in the 'march of mind,' spokesmen for progress could feel that only the perverse or quixotic would deny the complete superiority of the modern world to classical antiquity. The stimulus to argue the question of progress in terms of the old conflict was partly provided, we may assume, by the traditional prestige of Greece and Rome as well as by the precedent of a conventional ancient-modern controversy. In any case the more immediate motivation was concern over the status of the classics in the traditional school curriculum. It was in this connection particularly that the idea of progress figured in the educational development and, therewith, in the changing literary culture of the nation. Whatever the precise aim or motivation, however, many a Baconian, filled with a sense of the superior merit of his own age, engaged in disparagement of the ancients and their cultural attainments. The Hellenes especially, though not exclusively, were subject to the disapproval of the Baconian of "Hebraic"

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stamp, who pictured them as a passionate, immoderate and unruly lot, composing social units resembling nothing so much as fickle and tempestuous mobs.

This concept of the ancient Greeks as passionate, volatile, and supremely imaginative as well, found extensive expression. It was related to the primitivistic notion that they were naïve children of nature. A disposition to glorify their achievements could induce a glorification of alleged primitive virtues--their art and literature then becoming pristine and genuinely heart-sprung creations fresh from the matrix of nature; on the other hand, a disposition to disparage could, and frequently did, mean protests against deference being shown 'those who really represented, in the words of Lord Bacon, the youth and not the old age of the world.' 'Had not Solon himself, as Plato reports, been told by an Egyptian priest that the Greeks were mere children, without any tradition or science that is hoary with age?'[1] "The ancients were unlike us," declared James Percival, "for they were mere children of nature ... governed more by the

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[1] Timaeus, 22. This is cited at times in connection with the point of view being discussed.

It is interesting to note that Rousseau, on the few occasions that he does refer to the Greeks, reflects the primitivistic concept. This was the same notion of the Greeks as nature's children that Fénelon shared. Cf. H. Trevelyan, Popular Backgrounds to Goethe's Hellenism (London and New York, 1934), pp. 86-92.

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impulse of feeling."[2] The Hellenes were "boys in the sunshine" to Thoreau,[3] and a nation of youths to Emerson: the Ten Thousand retreating with Xenophon reminding him of "a gang of great boys."[4] In the "elegant creations" of their "brilliant fancy," Alexander Everett could "discern little more than the sports of infancy playing in wantonness with ideas, of the importance of which it is utterly unconscious."[5] "I am much persuaded," wrote Francis Gilmer,

> that Hesiod's golden age of the Greeks would have presented to an actual observer nearly the same mixture of insensibility, vulgarity, and vice, that we found to exist, among our less classical brethren of the woods, [the Cherokees].[6]

And the Autocrat of the Tea Table, suggesting something of the literary background of such impressions, pronounces Achilles himself "little better than a Choctaw brave."[7] Even

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[2]"On Some of the Moral and Political Truths Derivable from the Study of History [Yale Phi Beta Kappa Oration, 1822]," in J. H. Ward, Life and Letters of James Gates Percival (Boston, 1866), Appendix, p. 536.

[3]Summer, Riverside Edition (New York and Boston, 1884), p. 355.

[4]"History," in Essays, First Series (Boston and New York, 1876), pp. 27-29.

[5]An Address Delivered before the Peithessophian and Philoclean Societies of Rutgers College, on the Literary Character of the Scriptures (New York, 1838), p. 10.

[6]"Reflections on the Institutions of the Cherokee Indians," Analectic Magazine, XII (1818), 39.

[7]O. W. Holmes, Over the Teacups (Boston and New York, 1895), p. 74. [Contd. on p. 109]

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the artistic achievement of the Greeks was explicable, it seems, by their very proximity to nature--by "a close application to nature," which in the opinion of Philadelphia's noted Dr. Godman made possible more accurate delineation and hence superior creation.[8] Their fidelity "in the imitation of nature," M. Charles Paterson told the American Academy of Fine Arts at its twelfth exhibition (1826), "the constant and close imitation of those perfect forms which surrounded them," was "the more immediate means" of their excellence in art.[9]

[Footnote 7, contd.]

Caleb Atwater, prominent Ohioan of the period and pioneer in the study of Indian antiquities, likewise found a ready analogy between Greeks and Romans 'of their heroic age' and the Creek Indians. "Remarks Made on a Tour to Prairie du Chien; Thence to Washington City," Writings (Columbus, 1833), pp. 303-315.

[8] Addresses Delivered on Various Public Occasions (Philadelphia, 1829), pp. 136-141.

[9] Address Delivered at the Opening of the Twelfth Exhibition of the American Academy of the Fine Arts (New York, 1826), pp. 10-14.

Apparently no inconsistency with assumptions of realism or naturalism was suspected by sentimental Hellenists in asserting with equal readiness the 'Greek power of fancy' to be characteristic of the childhood of the race as of the species. It was not, however, necessary that one adjudge the Greeks to have been realists in order to fit them into a primitivist picture, as is indicated by this exclamation of a contributor to the Southern Review in 1832: "Who would not sigh for the happy nature of the ancient Greeks, the people to whom the ideal was a native inheritance." (VIII, 475.) The merging of primitivism and the notion that the Greeks had captured the beau idéal in their artistic creations, is quite

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The primitivistic notion of the character of the cient Greeks is not at all incompatible--as amply proven Télémaque--with the variant and likewise prevalent idea erein the Hellenic spirit and the Anacreontic mood are entified: one need only conceive the natural as the sen- tive or the 'feeling,' the delicately aware and exquisite, as marked by the casting off of 'artificial' restraints the expression of emotion (generally aided by deep draughts wine in wreathéd goblets and amorous dalliance amid benign tural surroundings, all exceedingly Watteau-like). Feeling

[ootnote 9, contd.]

accord with the tendiency of sentimental naturalism (vid. fra, pp. 341-354, 524). In James Gates Percival the aturalizing' of the spirit is not difficult to discern ied the word-wrappings of what is ostensibly the Platonic etaine of 'forms.' Percival shared the primitivistic no- on that the ancient Greeks and Romans were imbued with he poetic inspiration of childhood," and that their crea- ve powers derived from immediate contact with nature. (In ct, his concept of poetry and the process of imaginative eation followed, in general, Wordsworth's.) At the same me, Percival adopted the idea that the achievement of the cients in art and literature is timeless and unexcelled, be- ase they grasped and incorporated in their works the ternal Forms." Obviously, then, the "Eternal Forms" must side in nature, where unsophisticated pagan or unspoiled ild apprehends them. Cf. the following works of Percival r evidence of these ideas: "The Mind," in Poetical Works oston, 1859), II, 126-133; Ibid., I, 381-402; II, 8-16, -71; also J. H. Ward, Life and Letters of Percival, pp. 6, 560-562. On the association of pseudo-Platonism with manticism, see Irving Babbitt, The New Laokoon, an Essay the Confusion of the Arts (Boston and New York, 1910), 87-114.

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and emancipation are as much a part of the Anacreontic idea as of primitivism. The butterfly with its delicate beauty, "restless life" and "wild and uncertain flight" is for one American writer a most appropriate symbol for "the intellectual character of Greece."[10]

A lover of classical antiquity such as the clerical littérateur, Samuel Gilman, would describe these putative qualities of the Greek mind as sprightly, naturalistic, ardent--traits of genius.[11] Others, following Schlegel, might speak of the "restless activity and ever-changing vivacity of the Grecian mind";[12] but these were not, however, qualities to impress a Baconian--particularly if endued with a Puritan bias. For the "hard temperament" it was only a matter of adjusting diction pejoratively, after the manner of a contributor to the Southern Quarterly in 1844 who censured the Athenians as "fickle and capricious," "feeding and thriving upon change," incapable of the sober qualities essential to social stability, their "popular assemblies ...

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[10]"Herder's Philosophy of History," South. Quar. Rev., V (1844), 306-307.

[11]"The Reciprocal Influence of National Literatures," in Contributions to Literature (Boston, 1856), pp. 99-103. This essay was published in the South. Quar. Rev., XII (1847), 306-329, but it is dated 1836 in op. cit.

[12]"History of Literature," South. Quar. Rev., II (1842), 485.

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a promiscuous concourse, tumultuous, hasty, violent, ever open to the wiles of the demagogue." "To admire Athens," adds this writer, "let us look to Athenian art, never to Athenian law."[13] Which last could be but dubious praise to any Baconian who felt with the writer in the American Quarterly some years before (1830) that

> progress in the fine arts is a far less certain indication of refinement, than are roads and inland navigation;[14]

or to whom, in any case, the fine arts and belles-lettres were a sort of inferior product of a lesser human faculty predominant "in the infancy of the species."[15] "I would not exchange," John Henry Hobart at one time asserted,

> the freedom, the substantial comfort and happiness that distinguish the infant country that owns and protects me, for all that recollection can supply of what is great and glorious in genius or in achievements, or all that art can furnish delightful to the eye or grateful to the feelings, which, alas! now only serve to mark, with greater humiliation, the fall, and

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[13]"Law and Lawyers," Ibid., VI (1844), 377-378.

[14]VIII, 285.

[15]"Journal of the Academy of Natural Sciences," Analectic Magazine, XI (1818), 191-192.

Thus also Jacob Bigelow, who contended that poetry and oratory flourish "in perfection during the youthfulness of intellectual cultivation"; whereas "in modern times there is a maturity, a cautiousness, a habit of induction, which is founded on the advanced state of philosophic knowledge." Elements of Technology, pp. 3-4.

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> abject condition of oppressed, enslaved, and degraded Italy.[16]

There was little hesitation among such foes of classical learning as Dr. Samuel Jackson of Northumberland to dismiss the ancients as "coarse and unrefined" if not thoroughly barbaric.[17] Even when compelled to admit that Greece in her ancient glory displayed "the noblest powers of the mind," one was obliged to mention accompanying "moral degeneracy and frivolous licentiousness."[18] The homage accorded "Delphos and the Parnassian hill" is not without reason, admitted G. H. Devereux, reviewing The Last Days of Pompeii for the North American (1835),

> but the scholar, however enthusiastic he may be, must feel that the picture has its dark shades, and the beautiful medal a rough and even hideous reverse. Though we look upon it with the extenuating tenderness with which we gloss over the failings of the departed great and good,--it is an obvious truth, that antiquity, even classical antiquity, is but another name for an era of ignorance, of credulity, of folly and even of savage barbarity.[19]

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[16] The United States of America Compared with Some European Countries, Particularly England (2d edition, New York, 1826), p. 11.

[17] Nature Improved, or a New Method of Teaching Languages, Exemplified by Its Application to Latin, Greek, and French (Philadelphia, 1827), pp. 33-34.

[18] "History of Greek Literature," South. Rev., VI (1830), p. 34.

[19] XL, 449.

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According to James Hillhouse (he who achieved so ephemeral a triumph with Hadad), the ancient Greeks may have been "subtle" and "brilliant," but they lacked "depth" and "seriousness"--and, above all, the light of Revelation, by which alone are disclosed the highest moral principles and the "awful truth" about "Eternity."[20] To Thomas Grimké the entire cultural achievement of classical antiquity was no more than

> the gilded horn and the flowery chaplet of victim-nations, offered up in living sacrifice to the Idols of Passion and Pleasure, of War and Ambition.[21]

The ancients indeed may have possessed fertile imaginations, been keenly sensitive aesthetically, but they lacked those sturdy virtues and that proper direction of interests without which the melioration of mankind is impossible--those virtues that are infinitely more worth while than mere taste and splendor. Naturally the Baconian with his emphasis upon the factual and the practical, upon hard reason--or in the Yankee phrase, horse sense--was not going to give unwarranted value to such things. In fact he was prone to see little but

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[20]"On the Choice of an Era," in Dramas, Discourses, and Other Pieces (Boston, 1839), II, 64-91.

[21]"Oration on the Advantages to Be Derived ... from the Introduction of the Bible ... Delivered before the Connecticut Alpha of the Phi Beta Kappa Society ... 1830," in op. cit., p. 114.

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superficial worth in any art or literature. The Bible excepted, of course--that being in the same category, on a higher level, with Blackstone and the Federal Constitution. "Of what avail indeed," asks Grimké,

> were the original fires of Grecian genius, and the imitative splendors of Roman taste, if they produced so little effect on the actual happiness and improvement of the people?[22]

In this latter respect they were still barbarous. "While Athens," he explains,

> was a wild democracy, and Sparta a republic in name, but, in reality a compound of monarchy, oligarchy and democracy--the imperial republic of antiquity exhibited all the fierce elements of anarchy and tyranny, of rebellion and despotism, under a form still more imperfect, and far more terrible at home and abroad, than the many-headed monster of Athens, or the triple-bodied monster of Sparta.[23]

All of which proves for Grimké that

> man unassisted by Revelation, however richly he may be gifted by nature, must be the victim of darkness and error, on the most important of all subjects--Duty--whether to our Maker, to ourselves, or to our fellow mortals; whether social or domestic, public or private.[24]

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[22]"Address on the Character and Objects of Science," Ibid., pp. 14-15.

[23]Ibid., p. 14.

[24]Ibid., p. 16. Alexander Everett reveals this same pious attitude in appraising ancient philosophy, the chaos and inadequacy of which, he contends, is seen at once in the light of Scriptural truth. On the Literary Character of the Scriptures, pp. 12-13.

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"Oh Greece!" poetized the youthful William Cullen Bryant,

> thy flourishing cities were a spoil
> Unto each other; thy hard hand oppressed
> And crushed the helpless; thou didst make thy soil
> Drunk with the blood of those that loved thee best;
> And thou didst drive, from thy unnatural breast,
> Thy just and brave to die in distant chimes;
> Earth shuddered at thy deeds, and sighed for rest
> From thine abominations; after-times,
> That yet shall read thy tale, will tremble at thy crimes!

And as for Rome, although she "awed the world with her imperial frown,"

> Yet her degenerate children sold the crown
> Of earth's wide kingdoms to a line of slaves.[25]

For the social virtues that count one had to turn to the present. "The truth is," declared Calhoun before the House of Representatives in 1816,

> but little analogy exists between this and any other government. It is the pride of ours, to be founded in reason and equity; all others have originated, more or less, in fraud, violence or accident.[26]

George McDuffie, speaking before the House some years after, is less sweeping in his rejection of all political experience not American, but he too deprecates those who would seek precedents in antiquity. "It does really appear to me, sir," he says, rebuking the opponents of a proposal for

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[25]"The Ages," Poetical Works, ed. Parke Godwin (New York, 1883), I, 59-60.

[26]Works, II, 134.

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direct presidential elections,

> that the grave statesmen of the country are mistaking, on this subject, the images of their classic recollections, for the sober and substantial realities of life. They seem to forget that they are not walking in the groves of Athens, nor mingling in the conflicts of the Roman Comitia. They permit themselves to be carried away by false and delusive analogies.[27]

Ours, he reminds his colleagues, is not at all the turbulent, unstable sort of democracy that characterized antiquity.[28] In the opinion also of Professor Dew of William and Mary there is no valid analogy between the "beautiful" accord, the judicious organization, of our political system and "the wild extravagances and the capricious levities of the unbalanced democracies of antiquity."[29] Samuel Knapp insisted that "there has not been a great republic until this arose"--that Rome herself "can hardly be called a republic in any stage of her history."[30] The educator, William Sullivan, thought it quite inadmissible to draw parallels between our nation, so vast in extent and so enlightened, and the little

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[27]"Speech on the Amendment of the Constitution," in Eloquence of the United States, IV, 130.

[28]Ibid., pp. 121-122.

[29]"Address on the Influence of the Federative Republican System of Government upon Literature and the Development of Character," So. Lit. Mess., II (1836), 261.

[30]Dartmouth Phi Beta Kappa Address, 1824, p. 29.

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republics of ancient Greece tucked away in their meagre mountains. Nor does he, any more than Knapp, consider analogy with Rome justified:

> Our citizens and their institutions, resemble those of Rome, as little as those of Greece. ... among the Romans we see one city, subduing and governing nearly all that was known of the habitable globe, while the same city was alternating between popular tumult, and odious tyranny; the extremes of frugality and profligacy; ... at last, abandoned to a luxury of which there had been no example, and of which there could be no imitation....[31]

Of course, having had the misfortune to be without the influence of Christianity, the pagan ancients were irrevocably handicapped from the start. They thus lacked the essential ingredients for a truly elevated social order.

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[31] Discourse before the Pilgrim Society, pp. 15-17.

Edward T. Channing began his thirty-two years of lecturing in rhetoric and poetry at Harvard, with an exposition of the thesis that modern oratory could not be expected to follow ancient models, since modern governments had achieved stability and had made "the security of individuals and of the state rest on laws and constitutions, and not on popular caprice." Inaugural Discourse, Delivered in the Chapel of the University in Cambridge, December 8, 1819, Cambridge, 1819.

Jefferson and John Adams agreed that the ancient Romans knew nothing of 'enlightened principles of government.' "They had no ideas of government themselves," wrote Jefferson, "but of their degenerate Senate, nor the people of liberty, but of the factious opposition of their tribunes." And Adams replied: "I never could discover that they possessed much virtue, or real liberty." Jefferson, Writings, ed. Albert E. Bergh, Issued under the auspices of the Thomas Jefferson Memorial Association of the United States (Washington, D.C., 1907), XV, 233-234, 237.

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The principles of a Christian society, it was held, are peace and humility and philanthropy--principles sharply in contrast with those that were the mainsprings of ancient pagan society: war, ambition, pride and hate.[32] The Reverend Heman Humphrey felt that the little band of exiles who settled New England brought a heritage for their descendants far surpassing anything bequeathed to the world by the nations of classical antiquity. What though the Pilgrim Fathers "could not boast their descent from the fabled demigods of Latium or Troy," he declared at a bicentennial celebration of the Plymouth landing;

> what though no royal arms emblazoned their escutcheons; what though their achievements and sufferings are not enshrined in the golden numbers of a Homer, or a Virgil; and they have left us no triumphal arches, nor sculptured monuments, nor exquisite paintings; no Belvidere Apollo, no cemented manuscripts, no 'wide marble wastes,' and no Fuit Ilium: surely we need not lament this want of royal and classical renown, when the legacy of our fathers contains so much that is infinitely better. For while in daring and fortitude, they did not come behind the most renowned adventurers of antiquity, they possessed moral and religious qualities which as far out-shone all the heathen virtues, as the brightness of the sun transcends the ignited vapors of the stagnant pool.... To supply the want of literature and the fine arts, we have their laws and institutions, which, with some

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[32]Cf. Grimké, "Address on the Expediency and Duty of Adopting the Bible as the Text Book ... in Every Scheme of Education...," in op. cit., p. 104 (Note F).

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> exceptions ... bear the stamp of transcendent wisdom and forecast.[33]

Their high motives and correct principles, in contrast with those of antiquity, also became the theme of Daniel Webster's address on the same commemorative occasion.[34] Among the politically and socially benighted ancients, he maintained, "political science ... seems never to have extended to the comprehension of a system, which should be adequate to the government of a great nation upon principles of liberty." They had, for example, at best only an inadequate idea of the principle of "checks and balances." And as for the colonists of ancient Greece, they

> went not forth, like our ancestors, to erect systems of more perfect civil liberty, or to enjoy a higher degree of religious freedom. Above all, there was nothing in the religion and learning of the age, that could either inspire high purposes, or give the ability to execute them. Whatever restraints on civil liberty, or whatever abuses in religious worship, existed at the time of our fathers' emigration, yet even then all was light in the mental and moral world, in comparison with its condition in most periods of the ancient states.[35]

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[33]"Our Pilgrim Fathers," in Miscellaneous Discourses and Reviews (Amherst, 1834), pp. 81-82.

[34]This bicentennial evoked similar views from the Reverend Gardner Spring of New York City, who took the occasion to affirm "the wisdom of Divine Providence in the early settlement of New-England." A Tribute to New-England (New York, 1821), pp. 23-25.

[35]"First Settlement of New England," in Writings and Speeches, I, 191-193.

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In the opinion of Alexander Everett, "political science, the third great division of morals, is perhaps the one which was least satisfactorily treated by the ancients."[36] Nowhere in "the pages of classic antiquity," proclaimed Daniel Webster proudly, can one find a political document equal in merit to the Constitution of the United States.[37] There is apparently nothing that is not reprehensible in the social organization of ancient nations, we gather from an Independence Day oration delivered by the younger Robert Rantoul at the outset of his reformist career. "The fierce democracy of Athens," he asserted, and Sparta's military state, with its slavery and its "unnatural code" by which she "strove to eradicate all the finer feelings of humanity"--"both these chimerical systems ... proved total failures." And Rome, too, was no more than a "grinding despotism" of her "privileged orders."

> From a den of famished wolves prowling for prey, it made the seven hills the headquarters whence its victorious bands issued resistless to plunder and to conquest, and finally the storehouse of the accumulated spoils of the whole known world, civilized and barbarian. Throughout the course of this unparalleled career its essential features remained the same.[38]

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[36] Critical and Miscellaneous Essays, Second Series (Boston, 1846), p. 198.

[37] Writings and Speeches, XIII, 82.

[38] Memoirs, pp. 161-162.

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In short, it was deemed altogether evident that "the science of government has become better understood than formerly"[39] --that the ancients were mere children to the moderns in such matters.[40]

And they were equally ignorant in other respects, it seems, of the true principles of social organization. They knew no more of the Wealth of Nations than they did of Scripture. Under their system, "so much and so foolishly vaunted," we read in a brief biography of Robert Fulton carried by the Analectic Magazine in 1817,

> the idlers--the non-producers--monarchs, nobles, the military and the priesthood, were numerous: industry was confined to slaves, or to the lowest classes of society, and deemed dishonourable,

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[39]"Popular Education," So. Lit. Mess., II (1836), 92.

[40]The idea that ancient societies were inferior, particularly to the United States, in political morality and political sagacity is encountered frequently. It emerged in President Monroe's second inaugural address (1821), wherein he declared that "in our system, national and state, we have shunned all the defects which unceasingly preyed on the vitals and destroyed the ancient Republics." Compilation of Messages and Papers of Presidents, II, 93. The South Carolinian, Petigru, observed that the men of the American Revolution, unlike the ancients, knew better than to permit the state to have unlimited power over property, and that, although America may have sought to emulate the vigor of ancient republics, she did so "without impairing the safety and sanctity of private rights, so essential to modern civilization. Petigru also was of the opinion that discord characterized the ancient polity. "Oration at Ft. Moultrie ... June 28, 1844," in J. P. Carson, Life, Letters and Speeches of James Louis Petigru (Washington, 1920), p. 234; also "Fourth of July Oration (1834)," ibid., p. 149.

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> and disreputable. War was the favourite and fashionable pursuit; and warriors were ranked among their divinities. ... under this system, civilization could not permanently advance; the rights of men and of citizens were such only as a proud and warlike class of society, supported by a priesthood, might indulgently allow; the properties and persons of weaker nations were seized on and converted to the use of the conquerors; and the vanquished were made slaves.

"Such," the writer continues,

> are the glorious times of Greece and Rome, whose detestable morals, manners, and maxims, have been the theme of ignorant panegyric for ages past. This was the period of incivilized [sic] society.

In contrast,

> the modern system of civilization proceeds on the endeavour to make every member of society a producer, by the habitual exertion of some useful kind of industry: to gain by the prosperity, not by the misery of neighbouring nations: by barter, and not by plunder: to stimulate industry abroad for this purpose, as well as at home: to lessen as far as possible the number of drones in the hive...: to diminish also as far as possible, all necessity for naval and military systems: and generally, to abolish as far as possible, all orders of men, who have no means of living but on the industry of the producing class.[41]

The achievements of a utilitarian and middle class culture, progressively democratizing and in other ways meliorating society, were also applauded by William Tudor, one of the founders of the North American Review. He saw the "commercial principle" itself pervading modern society universally, as

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[41]X, 180-181.

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the source not only of public works more stupendous than anything Rome could ever boast, or of comforts for "a modern private gentleman" that a Roman proconsul could not enjoy even "with the plunder of a province," but also as a mighty force in the advancement of true religion and human liberation. "The modern state of the world," he writes,

> is wholly different from the ancient in this respect, and is becoming more so; it is this difference which constitutes our superiority: it is this which affects the cultivator of the earth, the artizan, and all those likewise, whose operations are connected with mental labour: it is this, which has stimulated the latent powers of production, and fertilized the wide fields of human exertion. It is this activity of the principle of commerce, that is alternately the cause and effect of our liberty, enterprise, science, and morality: it is this therefore, which has made known the rights, enlarged the capacity, multiplied the comforts, and ameliorated the condition of mankind.[42]

That classical antiquity, and especially Athens, "which first conceived the idea of entrusting the supreme power to the people," played a most significant rôle in the history of man should not be ignored, admonishes George Bancroft in the North American (1831). But, he adds, neither should we be blind to her faults.

> Our own confederacy does not more surpass the Grecian in the extent of territory, over which its liberties are diffused, than it does in

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[42] Letters on the Eastern States (2d edition, Boston, 1821), pp. 129-134.

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> the excellence of the details of its laws. The tendency of our institutions is to leave every thing to find its natural level, to throw no obstacles in the way of the free progress of honest industry, to melt all the various classes of society into one mass, to extend the rights of equal citizenship with unqualified liberality, and to break down every thing like a privileged order in the State.

How different "ancient Attica," suffering from the attendant "abuses" of a government that was nothing more than "a species of multitudinous aristocracy," of a system wherein "political power was ... vested in the hands of a privileged order, which consumed what it did not produce!"[43] Could there be any doubt at all of our superiority--we standing in the light of the American Revolution, not to mention Scotch philosophy? "The true notion of society does not even appear to have been recognised" by them, ventures F. H. Hedge.

> The single fact, that merchants were excluded from the 'Republic' of Plato, speaks volumes on this subject. There was nothing like social union, no hearty coöperation of individuals or states, to promote a common object. Of the two states best known to us, the one was a military school, the other an unmanageable democracy.[44]

Wanting the humane spirit that informs modern institutions, the ancients could not possibly have produced an

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[43]XXXII, 344. Also, with some minor alterations, in Literary and Historical Miscellanies, pp. 247-248.

[44]"Everett's Phi Beta Kappa Oration," Christian Examiner, XVI (1834), p. 11.

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enlightened social organization. There was, for instance, the matter of respect for women. This, so Caleb Cushing contended, "the surest evidence of genuine public refinement," obtained neither among the Athenians, for all their "epicureanism of taste," nor among the Romans who were too fond of the harsh, even brutal, virtues.[45] And another writer was sure that "it is a privilege for a woman to be born in these latter days"--that

> when one compares the respectful attention paid to a modern lady, with the gross familiarity used to ancient woman; when we place the refined sentiments of a Christian lover along side of the furious sensuality of the old Pagans; when we pass from the grossness of one of the odes of Horace to the better sentiments of one of our most ordinary novels, it is impossible not to own and admire the mighty change.[46]

(Surely the spirit of Bowdler with its effeminate sensibility was less inimical to the spirit of Rousseau than to humanism!)

However, it was in a greater respect for the individual generally that the superiority of modern over ancient society was thought especially evident, humanitarianism being considered the most noteworthy manifestation of the new attitude towards the individual. The whole political development of modern times, we are told in one instance,

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[45]"Legal Condition of Women," N. Am. Rev., XXVI (1828), pp. 316-356.

[46]"Female Education," New Eng. Mag., III (1832), 279.

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> arises ... from the fact, that whereas in antiquity the worship of deified matter, the religion of nature, if we may so term it, was the centre around which every thing revolved, the individual man is now the pivot on which the whole scheme of civilization turns.[47]

According to Alexander Everett, "the great characteristic idea" of our age, and "the germ of its chief developments, will be found ... in a regard, never before paid, to individual man."

> Not, as in the Grecian philosophy, to the ideal man, honored in theory and bodied forth in beautiful creations of art, while man himself was left ignorant and oppressed; but to the personal, actual being.[48]

In connection with the humanitarian ideal, classical antiquity was admitted to the most unequivocal strictures. Edward Everett would have had Americans turn to their own country for patriotic examples to inspire the young, because of the 'barbarity that marred the character of Grecian love of country.'[49] And Prescott the historian affirmed that

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[47]"Schlegel's Philosophy of History," South. Quar. Rev., III (1843), 297-298.

[48]"Popular Education," N. Am. Rev., XXV, 73.

The measure of man's progress, in the opinion of Amos Dean (lecturer on phrenology and founder of the Albany Young Men's Association for Mutual Improvement), is precisely the degree of individualism which he attains. "Well might humanity," he exclaimed on one occasion, "hold a jubilee upon the final separation of her elements." "Annual Address, Delivered before the [Albany] Institute, April 3, 1833," in Transactions of the Albany Institute, II (1833-1852), 33-52.

[49]Orations, I, 77.

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> there is nothing in which the Moderns surpass the Ancients more conspicuously than in their noble provisions for the relief of indigence and distress. The public policy of the Ancients seems to have embraced only whatever might promote the aggrandizement or the direct prosperity of the state, and to have cared little for those unfortunate beings, who from disease or incapacity of any kind, were disqualified from contributing to this. The beneficent influence of Christianity, however, combined with the general tendency of our social institutions, has led to the recognition of rights in the individual as sacred as those of the community....[50]

Classical antiquity, so F. H. Hedge maintained, failed to progress despite all its achievement primarily because it did not recognize such humane obligation, did not cultivate "social feeling": "we look in vain" for its contribution "to the cause of mankind," to the strengthening of "the ties which bind man to man."[51] Whittier readily admits that "Art and Beauty" may have been subject to the will of Greece, that grandeur and power may have been attained by Rome; but

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[50]"Asylum for the Blind," N. Am. Rev., XXXI (1830), 66. Prescott also shared the primitivistic concept of the ancients:

> The Greeks and Romans lived when the world, at least when the mind, was in its comparative infancy; when fancy and feeling were most easily and loved most to be excited. They possessed a finer sense of beauty than the moderns.
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> "Irving's Conquest of Granada," N. Am. Rev., XXIX (1829), 295.

[51]"Everett's Phi Beta Kappa Oration," Christian Examiner, XVI (1834), pp. 10-13.

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he would not have his audience, gathered at the dedication of Pennsylvania Hall in 1838, forget that

> ... in the porches of Athena's halls,
> And in the shadow of her stately walls,
> Lurked the sad bondman, and his tears of woe
> Wet the cold marble with unheeded flow;
> And fetters clanked beneath the silver dome
> Of the proud Pantheon of imperious Rome.

This "fair Hall," on the contrary, is "to Truth and Freedom given." Here

> Thoughts shall find utterance such as never yet
> The Propylea or the Forum met.
> Beneath its roof no gladiator's strife
> Shall win applauses with the waste of life;
> No lordly lictor urge the barbarous game,
> No wanton Lais glory in her shame.
> But here the tear of sympathy shall flow,
> As the ear listens to the tale of woe....

For this, indeed, is to be a "Temple sacred to the Rights of Man!"[52]

And what could the ancients have known about the rights of man? On that subject, according to Dr. Caldwell, they "might have derived useful lessons" from the people that produced Magna Charta, a document containing "more of the genuine principles of freedom and human rights, than all that the Greeks and Romans could boast."

> We venture to say, that for <u>every single paragraph</u> breathing a spirit of <u>rational freedom</u>,

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[52]"Pennsylvania Hall," <u>Writings</u>, Riverside Edition (Boston and New York, 1894), III, 60-61. The hall was burned down by a mob two days later! <u>Ibid.</u>, p. 58.

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> that can be found in the literature of Greece and Rome, one thousand are contained in the works of British, American, and other modern writers. Nor, on this subject, did the moderns borrow from the ancients. The reason is plain. The latter had little or nothing to lend.[53]

And yet there are those, Dr. Caldwell remonstrates, who can contend that the study of the Greek classics is the only preventive of "modern degeneracy and a depraved taste"--who can insist upon the necessity of "a dreamy knowledge ... of what the Greeks were doing and thinking four or five-and-twenty centuries ago!"

> Away then with the empty notion, that the cultivation of that literature is the only way to prevent 'modern degeneracy!' An exchange of the present condition of Christendom for that of the brightest period of ancient Greece, would be to barter improvement for 'degeneracy.'[54]

That human nature has advanced far beyond its state "in any previous age," is "past dispute or doubt," Daniel Barnard told the literary societies of the University of Vermont:

> Looking where the most favorable examples are to be found, it is seen in every thing. It is seen in internal qualities, and in external conditions; it is seen in men and in things; in forms of government, in the modes and subjects of legislation, in the attributes and bearing of armed and ermined Justice, in

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[53] Thoughts on Physical Education, and the True Mode of Improving the Condition of Man; and on the Study of the Greek and Latin Languages (Edinburgh and London, 1836), pp. 151-152.

[54] Ibid., 182-184.

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> pursuits and occupations, in the employment of time, in habits of industry, in the education of the common mind, in general manners, in the modes and means of living, in the possession and use of personal comforts, in intellectual independence, in the love and pursuit of all truth, in religious opinions and the form of religious worship, in sentiments and feelings, in works of mercy and benevolence, in the practice of the domestic virtues and the charities of life, in the curious inquisition which men are making into the secrets and mysteries of nature, in the unprecedented command acquired and acquiring over all the elements and materials of power for mechanical uses, and above all in the unwonted and wonderful agitations and an activities of the human mind on every subject, in every department of business or knowledge, and in every walk of life. The advantage we have over the nations of classical antiquity in regard to life and manners, sentiments, habits, morals and religion is palpable to the slightest observation; nor, in my judgment, is the superiority of modern mind over the ancient classical mind, any less positive or certain.[55]

In short there doesn't seem to be anything in which the ancients have not been surpassed, barring "taste"; but even there they can, according to Barnard, "be equalled" if not "excelled."[56]

Not alone then, it seems, did the ancients want the light of Christianity, but also the light of correct political and economic principles[57] (not to mention correct

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[55] Discourse Pronounced at Burlington, p. 43.

[56] Ibid., p. 44.

[57] Of course, these were not considered unrelated. Thus, according to DeWitt Clinton, the ancients never experienced the salutary social influence of a powerful public opinion

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principles for studying and mastering nature--but more of that later). What wonder that they never advanced any further in social organization or the amenities of life, being oblivious to Whig political ideals and Manchesterian economic doctrines--unblessed by the operation of the egalitarianism, humanitarianism and feminism, of laissez faire and a sense of the dignity of common labor and the nobility of commercial manipulation.

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Under the circumstances, why seek wisdom in antiquity? After all, as prevalent opinion had it, this the most moral, the most politically and economically sapient, and the most refined era in history. Gulian Verplanck assured the New York Mercantile Library Association that the intellectual resources available to the great Cicero himself were vastly

[Footnote 57, contd.]

deriving "its existence from the lights of Christianity, the invention of printing, and the diffusion of education." That the ancients, not being Christians, were incapable of sound moral judgments in general, is also argued by Clinton. D. Hosack, Memoir of DeWitt Clinton: with an Appendix Containing Numerous Documents, Illustrative of the Principal Events of His Life (New York, 1829), p. 180; Clinton, Life and Writings, pp. 303-308. Cf. also Atwater, Essay on Education, pp. 24-32.

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inferior to those within easy reach of members of the Association. Any of you, he observed, can find "a learned and able professor" to unfold, by means of modern apparatus, "the great laws of attraction and repulsion, of motion, of mechanics, and of light," as well as "truths beyond the reach of mere observation," which are "learnt from the demonstration of pure reason." Nor did Cicero have at his command the light of modern moral and intellectual philosophy, supplied by

> writers who, like Fenelon, and Addison, and Johnson, have 'given ardour to virtue, and confidence to truth'; or who, like Pascal, Paley, or Butler, have made logic and metaphysics the handmaids of sober piety.[58]

Indeed, this age is "the most philosophical the world has ever seen," maintained George Tucker,[59] professor of moral philosophy at Virginia University; and he bid his contemporaries admire not only the advance of Christianity and of the moral and physical sciences, but as well their own taste for literature "imbued with philosophy" and for history that records "the progress of society and the arts."[60] The intellectual supremacy of the moderns was seen as both cause

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[58] Discourses and Addresses, pp. 237-241.

[59] "On the Progress of Philosophy," So. Lit. Mess., I (1835), 407.

[60] Ibid., pp. 405-411.

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and effect in relation to the entire congeries of factors in the elevation of modern civilization, but nowhere did the operation of this superiority seem more drastic and its power more obvious than, as already noted, in ways Promethean. "In whatever direction we turn our eyes," declared Professor Tucker, "we behold some triumph of mind over matter."

> If the progress of philosophy, or human reason, has done so much in the moral sciences, it has done yet more in the physical branches of knowledge for the material world--more invites our attention and speculation--is more within the reach of experiment, and the benefits it confers are more direct and obvious.[61]

However, the "changes" thus wrought have

> in turn ... effected an immense change in the character of his mind. He has become less subjected to the dominion of his senses and more to that of his reason.[62]

Through application of the scientific method his mind has received salutary discipline; reason has been strengthened while superstition, prejudice and excessive passion have been extirpated.[63] Baconians generally were impressed with the idea that science can purify, liberate and strengthen the mind of man, both by extending his original powers of

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[61]"On the Progress of Philosophy," p. 409.

[62]Ibid., pp. 411-412.

[63]Loc. cit.

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perception and by giving his intellect the proper exercise and direction.[64] This belief is prominent in the arguments of Horace Mann and others who were striving at the time for educational reform.[65]

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[64]It was argued by Professor Farrar of Harvard, for example, that science has been instrumental in 'changing our intellectual no less than physical condition,' by making it possible for us to burst through the confines of the 'original faculties of perception.' To Professor Farrar this was actually tantamount to raising us in the scale of being. "We have," he remarks,

> in the first place, by direct aid to our natural vision, become acquainted with a vast number of objects, that were removed from our inspection; but, what is still more, we have invented means which have served as a substitute for the faculty itself. There may be beings, who comprehend in their view the revolving of the planets, as we do the motions of an orrery. So, on the other hand, there may be those to whom the particles of an acid and an alkali, in a state of effervescence, shall appear upon the same scale. Were our senses of sight such, that we could place in full view before us the planets of our system, as we do the little balls which we have made to represent them, we might have dispensed with all the labour and pains we have taken in observing and calculating them.... Is it not then, worthy of the highest admiration, that restricted as we are, we have, by our own resources and skill, supplied the want of faculties, that may belong to other orders of beings, so far removed from us,--that we have extended in each direction those limits, within which we seemed by the ordinary use of the senses to be confined?
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> "Learned Societies," N. Am. Rev., VIII (1818), 167-168.

[65]Vid. infra., pp. 316-320.

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Often, in fact, the sole evidence of man's intellectual advance acknowledged by a Baconian would be scientific advance, both frequently being identified; that is, there was only one basis and only one manifestation of intellectual progress: the proper method of investigating nature and of classifying and applying the truths thus garnered. Thought in any other context, for the fully developed Baconian, would be on the one hand either mere superstition, metaphysical dreaming or charlatanry, or on the other mere flight of imagination--the stuff of novels and poetry, important only to women, children and a few abnormal men, or at best only useful for those very few moments of relaxation that a good industrious Baconian could spare from the really significant and mind-tasking labors of the workaday world. Already early in the century, it will be seen, despite the persistent vitality of the traditional concept of the liberally educated gentleman, are found the strong beginnings of this attitude which the Bohemians of a later day were to characterize disdainfully as Philistinism. Moreover, it should be noted that even the old-school idea of litterae humaniores, under the apparently antithetical but actually supplemental influences of Baconianism and sentimentalism, was being pervaded by connotations of superficiality and mere embellishment, as indicated by the very use of such phrases as "polite letters" and "elegant literature."

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But to return to the more direct manifestation of Baconianism which is our particular concern here: the belief that the modern world had come to excel in intellectual power and means--had advanced in this fundamental respect far beyond past ages through scientific thinking and the proper application of its fruits. We have here, of course, an aspect of the Promethean theme--one which likewise stimulated the apotheosis of Science and Invention, and encouraged society's preoccupation with and faith in the daedalian. Extolled as befitted the mighty agents of man's intellectual ascent were the Inductive Method and Bacon, its prophet. Many a voice echoed the sentiments if not the precise words of Cowley's effusion:

> Bacon, like Moses, led us forth at last,
> The barren wilderness he past,
> Did on the very border stand
> Of the blest promis'd land,
> And from the mountain top of his exalted wit,
> Saw it himself, and shew'd us it.[66]

He it was who "allured men from the weaving of day-dreams to the employment of their reason," according to President Wayland of Brown; and hence the "mighty effect" which he "produced upon the world."[67] "Bacon," declared Alexander

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[66]"To the Royal Society," in Select Works, ed. R. Hurd (Dublin, 1772), I, 179.

[67]An Introductory Address Delivered in Boston, before the Convention of Teachers, and Other Friends of Education, Assembled to Form the American Institute of Instruction, August 19th, 1830 (Boston, 1830), p. 9.

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Everett, "merits the title of the father of modern philosophy, inasmuch as he invented the method which has produced the great discoveries of modern times."[68]

In this connection particularly would the moderns feel that they possessed an exceedingly effectual argument for undermining the prestige of the ancients.[69] The key to true

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[68]Critical and Miscellaneous Essays, Second Series, p. 392. Cf. also "Lord Bacon and His Philosophy," Knickerbocker Magazine, VIII (1836), 560-566. This latter is an attempt to vindicate the reputation of Bacon, and to impress mankind with the true merits of "the great inductive chief." "Men have, it is true," the writer tells us,

> cherished the name of the great inductive chief with some respect. They have styled him the 'father of experimental science,' 'the Columbus of the philosophical world'--and so far it is well. But who will assert that reverence enough has been paid, or probably ever will be paid, to so great a benefactor? P. 563.

[69]By comprehending the proper scope of inquiry and applying the proper method of investigation of the universe, argued Farrar, we moderns have risen to a true concept of the nature and operation of the universe:

> We have discovered ... what may seem almost a self-evident truth, that the world is a machine, an object of experimental examination, and that it is governed by uniform laws, and not by chance or caprice. We are able to look with composure upon those celestial appearances, which once spread universal alarm and terrour. We are delivered from innumerable impostures, that were formally [sic] practised upon the ignorance and credulity of mankind. Where are now the arts of divination, tolerated by the enlightened Romans, those of magic, sorcery, witchcraft, the trials by water and by fire, and the absurd pretensions of astrologers; and to what are we indebted for this salutary change so much as to proper understanding of the powers and operations of nature?

(Contd. on p. 139)

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knowledge, the "new philosophy," was become the distinguishing shibboleth of our brave new world; the handicapped races of man living before the Enlightenment had not learned the great lesson taught the world by Bacon: to let nature be the source of light--to observe nature first and reason only upon what we see there.

> Homo naturae[70] minister et interpres tantum facit et intelligit, quantum de naturae ordine,

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[Footnote 69, contd.]

"Learned Societies," N. Am. Rev., VIII (1818), 160-161.

And thus a contributor to the Southern Literary Messenger in 1840 (VI, 29), arguing that the Smithsonian Institution be devoted to science exclusively:

> We ask not the Egyptian for his fleetest dromedary,--our locomotives run over a whole degree of the earth's surface in a single hour. We need not the elephant of India to drag our ships ashore,--our steam-engines give us possession of power that is literally unbounded. We want not the Tartar with his swift Arab, for our electric telegraph can transmit our words from one pole to another, in the twenty-fifth part of a second. At our command the beams of the sun become artists, and paint on the plates of Daguerre, scenes which the pencil of Apelles could never have approached,--landscapes inimitably beyond those that adorn the canvass [sic] of Claude Lorraine. To send us to school to antiquity, is to degrade us indeed. The prattle of children, is no instruction to him that is bursting into manhood.

[70]And "nature," it should perhaps be emphasized, meant physical nature to the Baconian. This did not rule out, as further grounds for linking the rise of science with intellectual advance, the achievement of greater understanding of and hence power over the mind of man. Despite their protestations to the contrary, their vehement rejection of all imputations of materialism, we find writers of the period such as

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> re vel mente, observaverit; nec amplius scit aut potest.[71]

Thus had written the man for whose genius "it was reserved ... to dispute, and finally to overcome" the alleged superiority of the ancients[72]--the thinker whose object it had been, as Lord Brougham phrased it,

> to place before the mind, not the mock models of the world which others had framed, of which the theories of Aristotle, Plato and Epicurus, are specimens, but to present the world's true model as it exists in nature--to trace before the eyes of men the exact lines of truth.[73]

[Footnote 70, contd.]

George Combe and Dr. Caldwell developing the idea that even the intellectual and 'spiritual' sides of man's nature, if not admittedly in essence physical, at least operative under physical laws and deemed completely knowable through the same method of investigation successfully applied to matter. The monistic tendency inherent in the general Baconian Weltanschauung may be explicit or implicit, but it is nevertheless there, at times perhaps barely discernible and a welter of inconsistency and in the face of fervent invocation of traditional hieratic dualisms. When the challenge was inescapable and equivocation impossible, the Baconian was already prone to anticipate Herbert Spencer with the insistence "that absolute knowledge is impossible," that the 'modern man' transcends his antecedents precisely because "he knows that under all things there lies an impenetrable mystery." "Progress: Its Law and Cause," in Essays on Education and Kindred Subjects (London and New York, [1911]), p. 197. "The mind resumed its illusion, and society forgot its impotence," wrote Henry Adams. Op. cit., p. 485. Vid. infra, ch. VII.

[71]The first aphorism of the Novum Organum, Bk. I. It was quoted as a motto on the title page of the New England Journal of Medicine.

[72]Analectic Magazine, XII (1818), 47.

[73]"Account of Lord Bacon's Novum Organum," in American Library of Useful Knowledge, I, 264.

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For years college upperclassmen had been opening their Enfields to find after the very first definition, the scholium:

> Natural philosophy, being employed in investigating the laws of nature by experiment and observation, and in explaining the phenomena of nature by these laws, has no concern with metaphysical speculations, which are generally little more than unsuccessful efforts to extend the boundaries of human knowledge beyond the reach of human faculties.[74]

It had been the error of antiquity, as of all past ages, to set up such speculations as truth; it had been their error not to recognize in the inductive method the key to progress. In consequence it had been impossible for society to advance very far before Bacon appeared on the scene to illuminate man's intellectual horizon. The ancients "failed in their philosophy," affirmed the newly appointed Erving professor of chemistry at Harvard,

> because 'they reasoned more upon an imaginary system of nature, than upon the visible and tangible universe.'[75]

"Speaking of Plato," Jefferson wrote to William Short in 1820,

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[74]W. Enfield, Institutes of Natural Philosophy, Theoretical and Practical, Boston, 1820. The earliest American edition examined, that of 1802, also contained the quoted scholium.

[75]"Address Delivered on the Induction of John Gorham, M.D. as Erving Professor of Chemistry in Harvard University, December 1816," New-England Journal of Medicine and Surgery, VI (1817), p. 2. Gorham quotes Davy here.

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> ... no writer, ancient or modern, has bewildered the world with more ignis fatui, than this renowned philosopher, in Ethics, in Politics, and Physics. In the latter, to specify a single example, compare his views of the animal economy, in his Timæus, with those of Mrs. Bryan in her Conversations on Chemistry, and weigh the science of the canonized philosopher against the good sense of the unassuming lady.[76]

Even though Timothy Ford is willing to honor the literature of the ancients for "having caused the dawn of learning after the dreary darkness of the middle ages," he adds to the Baconian side the weight of his opinion that, as for science,

> its resources have been but imperfectly explored, and its principles much misunderstood in those periods of antiquity to which we are taught to bow with so much veneration; and that it has been the more happy lot of those who 'have come so lately into life' to trace the works of nature with more intelligence, more consistency, and more effect; and to give to every species of philosophical knowledge better and more pertinent directions to all the great ends that sound philosophy ought ever to propose to itself.

"The philosophy of the celebrated masters of Greece," he continues,

> which swayed the minds of the ancients, and attracted to the Academy and the grove every Roman who sought to be eminent among his contemporaries--with all its splendor and celebrity, was destined to sink in modern times, and be almost levelled with subjects of mere historic curiosity.[77]

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[76] Writings, XV, 258. On another occasion the disparagement of Plato takes the form of contrast with Jesus. Ibid., pp. 219-221. Of course, Jefferson revered the literature of the ancients, but as belles lettres only--which was not inconsistent with Baconianism.

[77] Op. cit., pp. 3-4.

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Apparently no other destiny was fitting for the cogitations of philosophers who, in the opinion of Jared Sparks, "amused themselves with speculations, fancies, dreams, which had little to do with the realities of things, or the obvious laws of nature." Among these early philosophers, Sparks goes on to explain,

> nature was not studied, nor its laws understood; knowledge was at a stand, truth hidden, and experience unknown. The master spirits, who governed the mind for so many centuries, were as much in the dark as the most humble and uninformed. That great magician, Aristotle, whose wand was so potent, 'after having trod in the open plains of history,' if we may credit Lord Bacon, 'and viewed the works of nature, yet dug to himself a dungeon, and filled it with the veriest idols'; and Plato, the divine Plato, according to the same high authority, was not only a 'well bred sophister, a tumid poet, and fanatical divine,' but he 'turned men's thoughts from the history of nature, and from things themselves, and taught the mind to enter into itself, and there, under the name of contemplation, to tumble over its own blind and confused idols.' Thus it was with those, who were called philosophers, and received the homage of the world for many ages, as the oracles of wisdom, and the true interpreters of nature.[78]

According to Sparks there is nothing in which the superiority of later ages to antiquity "appears more conspicuous, than in the ... discoveries of the laws, operations, and characteristics of the physical creation." He must agree with Bacon that this is indeed "the old age of the world."

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[78]"Wilson's and Bonaparte's Ornithology," N. Am. Rev., XXIV (1827), p. 111.

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However true it may be that the ancient Greeks and Romans possessed "the imagination, the fire, and the inquisitiveness of youth," and "the power of genius," nevertheless it was impossible for science to make other than slow progress at their hands. For they walked "without the light of experience"; and their very "systems" became "prison houses to the mind, rather than instruments for unfolding its faculties, and sending it abroad to seek nourishment at the fountains of truth." Moreover, and "worst of all," they constructed "these systems so ingeniously" and endued them "with such attractions, as to awaken the admiration and reverence of after times."[79] Caleb Cushing also echoes the slogan of the moderns: "Antiquitas sæculi, juventus mundi." And he, too, is willing to grant the ancients excellent taste and a certain native sagacity; but insists that in whatever requires patient observation--whatever is valued as the truth it contains--they are surpassed by the moderns.

> If, therefore, we may not say that philosophy, in our own times, has arrived at maturity, we

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[79] Op. cit., pp. 110-111. In the words of Sparks himself:

> we of the present day are in fact the true ancients, and Zoroaster, Pythagoras, Plato, Aristotle, and others, whose lot it was to come upon the stage in the opening scene of the drama of human existence, are in reality the younger brethren of the great family of mankind. Loc. cit.

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> may safely affirm that, as respects that of Greece and Rome, it has made a striking advancement towards maturity. The crude and imperfect reasonings of the ancients are verified and completed by us. ... he must be strangely blinded by prejudice, who can deny that our philosophy is incomparably superior to that of the ancients, whatever may be thought of their literary merit.[80]

"The fact seems to be," agrees one contributor to the American Journal of Education (1829), that the ancients

> had not discovered the true mode of advancing in [natural science]. Here ... they permitted themselves to be influenced by mere matters of feeling and opinion. They formed theories in their own minds, and persuaded themselves that these were true in fact. It is plain that they were in no condition to learn, for they aspired to make, the laws of nature.[81]

They may have been "giants" in the fine arts, comments a writer in the Southern Review at about the same time, but "in science, they were pigmies."

> They were elegant, eloquent, refined, polished: they were wordy, acute, disputatious, metaphysical. But in science, in real learning, in laborious and accurate investigation, they were an inferior people....[82]

The opinion was supported by no less an authority than Lord Brougham, who insisted that

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[80]"Ancient and Modern History," N. Am. Rev., XXVIII (1829), 315-317, 320-322, 339-340.

[81]IV, 3.

[82]"Higgins' Celtic Druids," IV (1829), 20. To which the writer adds the gratuitous insult: "they were the most vain-glorious liars upon earth."

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> in most of those branches of knowledge ... which rest on the basis of experiment and observation, the ancients almost entirely failed.[83]

To emphasize which deficiency Timothy Flint gives us in his Lectures upon Natural History the anecdote of the Greek sage confounded by one of Plato's disciples who wanted to know how it was possible for the sun, a single cause, to produce such different effects as perspiration and evaporation, blanching the lily and tanning the shepherd girl. The

> sage world-builder not being able to resolve the question of a scholar, touching the most obvious matters of daily observation, retired overwhelmed with shame from the academy.[84]

And that, Flint remarks, was

> in those ancient days so much boasted by the moderns, when the philosophers were content with believing that the sun was a fiery cloud of a foot in diameter, or at most no larger than Peloponnesus.

How great the contrast presented by our brave new world!

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[83] Op. cit., p. 209. For Lord Brougham's reputation in America, cf. "Popular Education," N. Am. Rev., XXIX (1829), 241-258; "Life and Character of Henry Brougham," N. Am. Rev., XXXIII (1831), 227-261. Note, too, the publication of Opinions of Lord Brougham on Politics, Theology, Law, Science, Education, Literature, etc., etc., as Exhibited in His Parliamentary and Legal Speeches, and Miscellaneous Writings, Philadelphia [1839], 2 vols.

[84] We must turn to modern science for the answer, according to Flint; modern science knows that "the great agent of these seemingly contradictory results is a subtile, invisible fluid ... called caloric (!)."--Pp. 183-184.

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> In these more fortunate days, we have in our ordinary schools young doctors of sixteen, and fair Euclids at twelve, who, standing at the black-board during an examination, are able at least to discourse learnedly upon these points of philosophy, if they cannot satisfactorily explain them.[85]

Another writer assures us that before a modern scientific society "even the voice of Plato could no longer attract listeners to the brilliant dreams of his imagination."[86] And Erasmus MacMaster, in his inaugural address as president of Hanover, subjects Aristotle as well to disparagement. For Aristotle, it seems, "chiefly expended the force of his great genius" upon "metaphysics and logic," and "contributed little toward a comprehensive and true system of natural philosophy." Whereas the philosophy of Plato

> seems to have consisted in a sort of transcendental mysticism, which, removing the field of knowledge beyond the sphere of human investigation, involved the subjects of metaphysical inquiry in the mazes of an impenetrable obscurity. And the opinion, so often reiterated, of 'the sublime wisdom of Plato,' 'the divine philosophy of Plato'--et id omne genus verborum--appears for the most part to have risen from that open-mouthed, and admiring faith, whose ruling maxim is--omne ignotum pro magnifico.[87]

Such derogation of the ancients for their alleged

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[85] P. 183.

[86] Analectic Magazine, XIII (1819), 27.

[87] Op. cit., pp. 7-8.

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ignorance of the 'true mode of philosophizing' is frequently encountered in the literature of the period. An article touching on any phase of the 'march of mind' is almost certain to include a contrast of ancients and moderns in this respect. Even when it was recognized that Aristotle should be given credit for the formulation of the inductive method, the issue could still be settled in favor of Bacon as the one who really accomplished the labor of "embodying the inductive method in a perceptive frame, and so suggesting and recommending it to the world."[88] Or one could be still less equivocal and make the shade of Aristotle itself confess to the shade of Bacon:

> You elevate my mind with the view which you present to it of this sublime philosophy [of yours]. While my method of philosophizing was a taper which shed a glimmering and dubious light through a very limited space, yours is the sun diffusing a full, clear, and searching lustre through universal nature.

To which the shade of Bacon might be made to respond:

> The results of the methods which I prescribed to the philosophic world, have borne more than a due proportion to any merits you may be willing to allow me in the discovery. It is the great instrument by which, in all the branches of modern science, such wonders have been achieved. It was by following in the track which I had marked out that Newton has developed, to the wonder and astonishment

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[88] [S. Gilman], "Brown's Philosophy of Mind," N. Am. Rev., XIX (1824), 4.

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> of mankind, the awful and hitherto impenetrable mysteries of the physical world; that Locke has successfully pursued his way through those dark and shady paths in the domains of Nature, which appeared impervious to the view and inaccessible to the footsteps of men; in a word, that all the modern investigators of nature have so triumphantly extended their researches into her most hidden and remote departments.

What more could a humbled shade of Aristotle say, but: "Let no one then deny you the meed of praise which you have so justly merited."[89]

Against a North American contributor who did venture so to deny Bacon--as having been anticipated by Aristotle--one writer for the Literary Gazette raised vehement objection. Why, "the most superficial observer must see at a glance" the "entirely new character" of the Novum Organum!

> If Aristotle had indeed taught us the art of reasoning,--Bacon has taught us an infinitely more useful art,--that of collecting the materials for reasoning. If the former has put together a profound philosophy of language, and traced out its various applications,--as an instrument of thought and study as well as of communication,-- ... Bacon, on the other hand, pointed to the philosophy of things,--and made man 'the interpreter of nature,'--and taught him to analyze and digest into a code that great body of her laws, which, since his time,

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89"A Dialogue Between Aristotle and Lord Bacon," Analectic Magazine, XI (1818), 399. This little exercise is signed "Warburton."

In the opinion of another contributor to the Analectic, Bacon's method bears the same relationship to Aristotle's logic, as chemistry to alchemy. VII (1817), 402-403.

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> it has been the business of the practical scholar to administer and apply. He called his work a 'New Engine,' in opposition to that intricate machinery of words, which the learned had used before, but which had wrought out so little for the benefit and improvement of man.[90]

To the Baconian, in short, all ages of man before the dawn of the modern world seemed shrouded in more or less intellectual obscurity. Of the Middle Ages the prevalent opinion is expressed in the North American for January, 1840:

> The prejudices and superstitions of a barbarous age, the spirit of pedantry and the love of controversy, an overwrought sophistry, and a constant proneness jurare in verba magistri, for a long time wrapped up, and entangled, and eclipsed all truth. Thus divinity soon degenerated into heresy and blasphemy; astronomy was confounded with astrology, medicine with sorcery, and chemistry with the arcana of alchemy. Men of science, erecting themselves into a privileged class, by the prestige of a dead language, of long flowing robes, and a mysterious air, secluded themselves from the people, and were looked upon with wonder and awe, not unmixed with distrust and contempt. Their ambition for a universal scholarship, when the relations between the different branches of learning were more imperfectly defined, and the means of acquisition were less within reach, engaged them in a labyrinth of disorderly pursuits, where they were exhausted and lost before coming to any profitable results. Science was to them an unfathomable ocean, of which they vainly strove to sound the depths, while their object should have been only to sail across it.[91]

However, "mere speculation," affirmed John Picket, the pioneer

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[90]"Lord Bacon and the North American Review," I (1824), p. 90.

[91][A. Gallenga], "Italy in the Middle Ages," L, 67-68.

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educator, "must give way before facts and their legitimate use," and

> it was the great Lord Bacon and his coadjutors that brought the human mind to know how truth is to be obtained, and to free itself from the shackles of opinion.[92]

"Happily for mankind, and the interests of science," Dr. Hosack concurred, there appeared "towards the conclusion of the sixteenth, and beginning of the seventeenth century," the "galaxy of talents ... that dissipated those clouds with which the Aristotelian philosophy had enveloped the world."

> It was not until this period that the human mind again recovered its freedom and dignity, and genuine science began to develope what had remained involved in the deepest obscurity. To commence this illustrious work was reserved for Lord Bacon, a man in every respect qualified for so great an undertaking. By the publication of his Instauration of the Sciences, he rescued reason and truth from the slavery in which they so long had been held; he effected a total revolution in the empire of science, and laid the foundation of the inductive system of philosophizing....[93]

In Ford's opinion the title, "father of physical science," was most suitable for the man who taught the world

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[92]"Literary Labor," Western Academician and Journal of Education and Science, I (1837-8), 35.

[93]"Observations on the Inductive System of Prosecuting Medical Inquiries," in Essays on Various Subjects of Medical Science (New York, 1824), I, 97. Dr. Hosack was a friend of DeWitt Clinton and president of the New York Historical Society and many scientific societies.

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> that the operations of nature are to be examined in their different forms and relations--that facts are to be collected, not speculations formed--and that the enquirer after truth was to look for the foundation of knowledge in the visible and tangible world; not in the books of the ancients, or in metaphysical theories.[94]

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[94] Op. cit., p. 7.

Having thus spoken in praise of Bacon, Ford turns to offer a rather complete exposition of the full-blown Baconian attitude towards science in life, which exposition, for being so exceedingly articulate, deserves quotation supplementing the above:

> When at length the immortal Newton applied his mighty intellect to what had been partially developed by Kepler and his coadjutors, and in his Principia promulgated the fundamental laws that were to guide the inquiries and govern the conclusions on subjects of physical science, a new career was opened to the human mind in studying the works of creation in every department.... The labours of philosophers now began with phenomena or experiment, instead of reasonings a priori--that fruitful source of error and perplexity. To discover a new fact or operation in nature was an honour to the greatest philosopher--to make just and accurate experiments one of his most valuable qualifications. Here was opened a field of competition in which all rejoiced at the success of the most fortunate--freed from those jealousies or controversies which agitate or divide the learned or other subjects; for 'facts are independent of fashion, taste and caprice, and are subjects to no code of criticism.' Men were in the pursuit of light--they had daily proofs that they were but mere Tyros in substantial knowledge--every science was deemed to contain many important secrets to be discovered--and every discovery was growing in value by new uses, applications or inferences, developed by the progressive improvements of philosophy.... The powers and habitudes of the human mind seemed to become

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"All the clouds of mysticism have dispersed," proclaimed another panegyrist of the brave new world.[95]

With the help of Bacon, it was argued, man has finally liberated himself "from the shackles of by-gone systems," and thus attained to intellectual maturity. He is no longer the deluded seeker after the philosopher's stone and the elixir of life; for he now understands the proper method and legitimate scope of inquiry into nature. True, Christian Revelation has illumined his path, but the light of Gospel cannot be dissociated from the light of the Novum Organum. It was under the stimulus provided by Bacon, that learning

[Footnote 94, contd.]

> enlarged, and extended in every direction; the operations of nature to be investigated with keener sagacity; and the deductions flowing from every quarter irradiated, with new and increasing light, the paths of the diligent inquirers into the laws of the physical world. It was therefore an important æra in philosophy, how plain and familiar soever it may now appear to us, when actual existences or matter of fact, were put as the basis of reasonings; and the circumstances, connexions and successions of the phenomena, as the guides to inductions or conclusions. To philosophy it gave more interest, more precision, more consistency, more utility; and, it is needless to add, rendered the study more plain and satisfactory.... Under the guidance of this improved philosophy, the sciences have made that degree of progress, which would no less have astonished the philosophers of former times ... than they do us, at the immense advantages which their application daily produces to society. Ibid., pp. 7-8.

[95] Am. Quar. Rev., V (1829), 144.

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came out of the cloister and the common things of life received the attention they merit.[96] It was then that 'science was wedded to the arts,' and utility became rightfully the standard of worth. The ancients, in their

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[96]Illustrative of a pervasive contemporary awareness of the importance given the commonplace in modern learning is this passage from an English "conversation book," the Rev. James Joyce's Scientific Dialogues (reprinted Philadelphia, 1829): The customary Papa, as obliging as he is omniscient, is dilating on the subject, "attraction of cohesion," for his Charles and Emma, and in the course of this exposition mention is made of a glue for mending broken china concocted out of "quick-lime, Gloucester cheese and warm water" by "a very able and ingenious philosopher, Dr. Ingenhouz." Whereupon little Emma interrupts to exclaim:

> "What! do such great philosophers, as I have heard you say Dr. Ingenhouz was, attend to such trifling things as these?"

To which "Father" makes reply:

> "He was a man deeply skilled in many branches of science; and I hope you and your brother will one day make yourselves acquainted with many of his important discoveries. But no real philosopher will consider it beneath his attention to add to the conveniences of life." --Pp. 26-27.

At the same time, the Baconian found the sublime in the revelations of modern science. Thus Jared Sparks:

> Look at the single discovery of Newton, in demonstrating the great law of the universe; trace this law from its action on the heavenly orbs, down to the minutest objects of nature around us, and behold it regulating every motion, sustaining the organization of matter, balancing the world on its centre, and ruling the affinities between the smallest particles in the masses of material things.
>
> N. Am. Rev., XXIV (1827), 111.

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blindness, had despised the useful arts and those who made their livelihood thereby; but Christianity and the principles of Bacon served to elevate the 'humble' arts and the 'humble' artisan to a respected place in the estimation of men. And as a result of all this, man has "increased the sum of knowledge a thousand times beyond what had been done by all antiquity."[97]

Clearly, then, the Baconian felt that one of the essential characteristics of the modern world, and one of the reasons for its superiority, was its appreciation of the true worth of 'facts.' Man, he believed, had finally learned to deal with reality, instead of speculation, fancy; 'things' not 'mere words' guided him towards an ever extending dominion over nature. Accordingly, as the scientist demanded a discipline in 'facts,' so the Baconian educator, as we shall see, demanded the study of 'things' not 'words' in the classroom, and the preparation of youth for 'practical living.' For the disciple of Bacon felt strongly with his prophet that "Truth and Utility are

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[97] Cf. Analectic Magazine, XIII (1819), 26; W. Johnson, "On the Combination of a Practical with a Liberal Course of Education," Journal of the Franklin Institute, II (2d series) (1828), 56; New Eng. Mag., I (1831), 1-3; Potter, op. cit., pp. 4, 11-12, 250-252, 279, 395-397; Rumford [pseud.], The Claims of Classical Learning Examined and Refuted by Argument, and by the Confessions of Scholars (Boston, 1824), p. 4; So. Rev., VIII (1831), 122; J. Sparks, in N. Am. Rev., XXIV (1827), p. 112; U.S. Lit. Gaz., I (1824), 61; L. Woodbury, Writings, III, 10.

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perfectly identical."[98] We of the present age, especially in America--so the Baconian argued--have learned this potent truth: that all knowledge worthy the name must serve humanity. In accord with this spirit he welcomed every token of the 'diffusion of knowledge.' Therein he found much of his assurance of the 'march of mind.' "We have great faith," wrote a contributor to the Southern Review in 1831,

> in 'Family Libraries,' and National 'Libraries,' and stereotype editions.... In this diffusion of knowledge throughout all classes of the community--which is only another mode of expression for universal and thorough civilization--consists the true and immeasurable superiority of the modern, over the ancient world. It has been justly remarked that the elegant philosophy of Greece was taught only to the rich. One of the signs by which a new and more happy order of things was immediately recognized, was, that the gospel was preached to the poor; and the same philanthropic spirit, the same comprehensive views of improvement and usefulness, appear in all the institutions of the Christian world. It was the boast of Socrates, that he had brought down philosophy from heaven to dwell among men--but her abode upon earth was still confined to the Academy, the Lyceum and the Portico. It has been reserved for a later age to complete the work which he only began, by making her empire universal.[99]

And the Reverend Levi Hubbell told the Albany Young Men's

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[98] Novum Organum, I, cxxiv; Advancement of Learning (London and New York, [1915]), p. 35.

[99] "The Family Library," VII, 247-249.

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Association that

> the cumulative treasures of useful and practical information, thrown weekly, upon your tables, from every part of this vast republic, and indeed of the earth, presents [sic] a clearer and fuller view of science, the arts and the world, and is [sic] exercising a mightier influence upon mankind, than all the garnered lore, that slept and perished in the vaults of the Alexandrine Library.[100]

In short, this is what the Baconian meant by the 'march of mind': With the help of the great 'innovators' of the age, we moderns have come to understand true social values as we have the true means and scope of knowledge. These truths we have combined and made prevail to the immensely greater enlightenment, security, dignity and comfort of man. Ours has been the revelation of the proper process for achieving knowledge. Moreover we have learned to value practical knowledge at its true worth. And finally, we have seen the necessity and assumed the Christian obligation to diffuse that knowledge and its fruits: to shed the new learning and its blessings over the earth. We are thus

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[100] Oration Delivered before the Young Men's Association of the City of Albany, at the First Presbyterian Church, July 4, 1835 (Albany, 1835), 17-18. Which, on the face of it, does not argue utilitarianism. The problem was just where to draw the boundaries of the utile; the Baconian cui bono was much too narrowly defined, as a rule, to satisfy the man who still honored humane letters. Hubbell also contrasts the ancients and moderns in this respect: "The pride and selfishness of the ancient world, led them to hoarde and to bury their learning, as the miser does his gold, or as the modern Turk, does his feminine beauty and virtue." Ibid., p. 18.

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dedicated to active Christian principles. Man's 'new knowledge' is power, and that power will give greater effect to his enlightened principles. Who, then, shall presume to call us children of our fathers? Who shall pretend that we must search their remains for wisdom?

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CHAPTER VI

The Sense of Power

Fundamentally the Baconian was optimistic about the direction of the new forces released to society, even when his theological conditioning exacted an admission of need for some moral guidance deriving from a source essentially different from matter. He saw the new forces doing work--and doing work was good. He saw, in fact, the entire structure of modern civilization and the envisioned structure of future civilization, still brighter and still more powerful, developing out of energy in matter tapped by the wizards of science. Force impresses. Apparently sentience cannot remain sentience, denying force, but can merely substitute one type of force for another. The Baconian was impressed by scientific force and its harnessed force-productions.[1] That power over nature which was seen as

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[1]Cf. Juvenile Philosopher (Geneva, 1826), p. 85:

> In order ... to produce the most brilliant effects of galvanism, there must be a combination of several batteries, connected by metallic cramps. The most powerful combination of this

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the basis of progress issued in respect--even worship--of itself and of anything tending to promote it. Accordingly, we have the apotheosis of the scientist and inventor. Even "mechanical philosophy" resides in a "lofty region" where

> the name of Newton is emblazoned in characters as imperishable as science; and grateful to his intelligent followers as the kindling splendours of Aurora.[2]

The Galileos, Boyles, Franklins, Watts--these were the high priests of the new Power; they

> merely held out their hands--like Newton, watched an apple; like Franklin, flew a kite;

[Footnote 1, contd.]

> kind that now exists, is that in the laboratory of the Royal Institution.

To this piece of information the following note is appended by the author of the Juvenile Philosopher:

> 'It consists of 200 instruments, connected together in regular order, each composed of ten double plates, arranged in cells of porcelain...; the whole number of double plates is 2,000, and the whole surface 128,000 square inches. This battery, when the cells were filled with sixty parts of water, mixed with one part of nitric acid, and one part of sulphuric acid, affords a series of brilliant and impressive effects.'

Cf. also, for the admiration machinery has been able to evoke: "Manufactures of Massachusetts," N. Am. Rev., L (1840), 223-230.

[2]"Essay on the Classification, Mutual Relations, and Various Uses of the Physical Sciences," Analectic Magazine, VI (1815), 127.

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> like Watt, played with a tea-kettle--and great forces of nature stuck to them as though she were playing ball.[3]

It is upon the control of such forces that man's security depends, in the opinion of John Farrar, Harvard's Hollis professor of mathematics and natural philosophy:

> We realize the great and important maxim, that knowledge is power. We hail the benign light of science, like the beautiful bow in the cloud, as the surest pledge vouched to man, that the earth shall not again be visited with desolation.[4]

Simply, behind the prestige of physical science as conceived by Bacon was the manifestation of power and the promise of power. The superiority of modern over ancient society was argued by pointing to our augmented control over matter. An even more glorious future for the human race was prophesied if only men would understand rightly and take to their hearts Bacon's dictum that knowledge is power.[5] So impressive was the promise of scientific power

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[3]Adams, Education of Henry Adams, p. 486.

[4]"Learned Societies," N. Am. Rev., VIII (1818), 163-165.

[5]The phrase seems to have been current enough to provide material for a punster of the period:

> "Hallo, Jim! Where are you going in such a hurry?"
> "Going to the theatre, to see that glorious boy, Knowledge."
> "Going to see knowledge?--acquire it, you mean."
> "No, I don't; I'm going to see Power. Knowledge is Power, they say; so Power must be Knowledge. What time did you rise this morning?" So. Lit. Mess., VI (1840), 835.

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that, as we shall see later, it could be unhesitatingly affirmed efficient in the control of man's moral and intellectual life. As early as 1816 Dr. John Gorham of Harvard pointed to the existence of unrestrained visions of the power of science--fore-tokens of what the disillusioned of a later day were to censure as modern man's superstition. Having briefly reviewed the progress of chemistry. Dr. Gorham remarks:

> The component parts of the human body have been analyzed with the most scrupulous exactness. Man has been reduced to a few simple principles, or elements, and the changes that take place during life, have been explained with the same ease as those which disorganize the body after death. Nay, the zeal of the chemists has carried them so far, that they have attempted to compose some of the proximate principles of animals by mixture, or by the powers of voltaic electricity. There are some, in this country, who have thought, and have even published the brilliant idea, that the chemist may soon be able to crystalize [sic] a man, and animate his crystal by the agency of electric matter. It would be useless to attempt to refute an opinion so absurd and so impious.[6]

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[6] Op. cit., p. 12.

Cf. Mary Shelley's Frankenstein, or the Modern Prometheus, first published in 1818, though being written as early as 1816 (the year in which Dr. Gorham delivered this address): "So much has been done, exclaimed the soul of Frankenstein--more, far more, will I achieve: treading in the steps already marked, I will pioneer a new way, explore unknown powers, and unfold to the world the deepest mysteries of creation." (Edition: London and New York, 1912), p. 40. Mrs. Shelley herself refers to Erasmus Darwin as reputedly having engaged in experiments to discover the "principle of life." Ibid., Introd., p. x.

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But, if with less sanguine expectation, the Baconian aphorism was become a very prevalent article of faith--with knowledge, be it remarked, interpreted as scientific knowledge: knowledge based upon the observation of physical phenomena. It is by that portentous instrument of power, the inductive method, writes a contributor to the American Journal of Education in 1829, and by the impetus it has given to knowledge, that "the external world has been made to yield its treasures for the convenience and gratification of man"--and even more, to produce a "new and increased strength and vigour and independence of mind."[7]

The same faith was, of course, expressed earlier than this in nineteenth-century America. We find, for example, that Stephen Elliot, although cherishing the old-school concept of liberal culture,[8] shared the 'new faith' with a conviction equal to most. In 1814[9] he proclaimed the beneficent power of science before the Literary and Philosophical Society of South Carolina, of which he was president. "It was the observation of one of the wisest men of

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[7]"The Philosophy of Bacon," pp. 3-8.

[8]Cf. his Address Delivered at the Opening of the Medical College in Charleston (S.C.), on Monday, the 13th of November, 1826; reviewed in U.S. Review and Literary Gazette, II (1827), 368-376.

[9]Reprinted in Analectic Magazine, VIII (1816), 154-173.

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modern ages," asserted Elliot,

> it was an aphorism of Lord Bacon, that knowledge is power. No axiom is more generally true in its individual, none more certainly true in its national application. Knowledge is power.

"How wonderful," he continued,

> the difference between the poor, naked, wandering savage, trembling before the elements, whom in terror he adores, depending on his solitary, unaided exertions, for food, for arms, for raiment, for shelter; and the civilized man, who strong in the science and resources of society, rides over the ocean, even on the wings of the tempest; disarms the lightning of its power; ascends the airy canopy of heaven; penetrates into the profound caverns of the earth; arms himself with the power of the elements; makes fire, and air, and earth and water, his ministering servants; and standing, as it were, on the confines of nature, seems, as by a magic talisman, to give energy and life, to the brute elements of matter.[10]

And speaking before the same society in 1817, Mr. Timothy Ford, one of its vice-presidents, helped to justify his veneration for the science of chemistry by indicating how a knowledge of oxygen and some of its prominent characteristics has made possible a better understanding of the economy of the universe, and consequently greater control over nature.[11] Men have always sought power, explained Dr. Bigelow--power over men and nations, or over nature.

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[10] Separately published edition, already cited, p. 16.

[11] Op. cit., pp. 22-25.

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But, he adds, the former is transient; only the latter becomes part of the increasing heritage of mankind.[12] The inventor and reformer, Zachariah Allen, brought out his Science of Mechanics with the express hope that it would "prove serviceable in aiding ... the 'triumph of mind over matter.'" "The science of Mechanics," he declared, "truly demonstrates that 'knowledge is power'; it enables "a common individual ... to accomplish more than the fabled labours of Hercules."[13] Alonzo Potter recommended that pupils be taken on visits to shop and "manufactory" in order to appreciate with all their senses, that the laws of nature "are no barren generalities, but are most powerful and useful agents."[14] William Seward spoke of "achievements to which human industry was once deemed inadequate," now become "easy and familiar" through an understanding of "the laws of power and motion."[15] And President William Allen of Bowdoin, although admitting the weakness of man in comparison with the

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[12] "Inaugural Address," N. Am. Rev., IV (1816-1817), 271-272.

[13] The Science of Mechanics as Applied to the Present Improvements in the Useful Arts in Europe, and in the United States of America: Adapted as a Manual for Mechanics and Manufacturers, and Containing Tables and Calculations of General Practical Utility (Providence, 1829), Preface, p. v.

[14] Principles of Science, pp. 14-15.

[15] Works, III, 171.

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might of Deity, found nevertheless imposing, the power "to fuse the rock or sand" into "transparent flint," or to "seize the volatile and invisible air, and compel it to reveal the secret of its wonderful composition."[16]

Learned societies are important, Dr. Robert Bruce told the Pittsburgh Philosophical Society in 1828, precisely because they aid in extending man's control over nature. True, Dr. Bruce admitted, learned societies have been cultivating such "ennobling" arts as music, but in addition

> they have perfected, both by chemical process and mechanical structure, every instrument which is useful to the eye, which can measure time, which can adjust weight; which can estimate the degree of heat or moisture which is in the atmosphere; which can ascertain the velocity of the wind, or the temperature of the different latitudes of the ocean; and which can show the movements of our earth, and all her sister planets in their elliptical orbits around the sun. They have improved machinery to be elegant and harmonious, they have connected it with principles of power which are equally energetic and under the laws of control; and they have set it, under the ingenuity of their designs, to ease the toils and relieve the labour of the human family.[17]

And by such power "the whole face of society is changed,

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[16]"The Knowledge of Man (1824)," in Decade of Addresses, 1820 to 1829, pp. 88-91.

[17]Quoted in AJE, III (1828), 625-626. Dr. Bruce was president of the Pittsburgh Philosophical Society at this time.

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and the wilderness has become a fruitful field."[18] For the promise of power to be fully realized, one contributor to the Southern Review admonished, "it is essential" for man to "acquire an intimate insight into the laws and principles" governing natural phenomena. "And," he added,

> if the whole extent of our material world is thus submitted to our investigations; if the powers, the productions, the volition itself of the animate, and the materials of the inanimate tenants of our globe are more or less subjected to our control, and may be rendered subservient to our purposes, need we inquire whether these researches are useful, even in the narrow sense to which utility is sometimes confined. ... for, as the knowledge of man over the component parts of the material world has been extended, his dominion has been greatly enlarged, his resources and his enjoyments proportionally multiplied.[19]

That man had already realized in abundant measure Bacon's promise of 'empire over Creation,' was confirmed in the American Quarterly in 1829:

> We have given to agriculture a redoubled capacity to support our race; we have almost created new fruits and new animals, by enlightened practice. We have so much facilitated manufactures, by labour-saving machinery, that they reach after new worlds for a mart. We have accelerated intercourse by steamers, canals, and rail-roads, until time and space are almost nothing. We have elaborated our earths, salts, and minerals, into all the shapes that comfort, health, and luxury can

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[18] AJE, III (1828), 626.

[19] II (1828), 412.

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> desire. We have decomposed every substance, extracted every essence, and figured every object.

In short,

> Steam-power, labour-saving machinery, with all their concomitant inventions, enable us to subsidize nature herself, and to go forth that real lord and master, so proudly promised in Holy Writ.[20]

The very character of the age was seen by Levi Woodbury as determined by man's control of physical nature, the application of material power. "Utility," he remarked,

> is ... fast becoming the great touchstone, the beacon light, the necromancer of the age. Mere warriors, also, as well as mere scholars, are finding their proper level. It has been boldly, if not truly, asserted, that the invention of a machine and a road, by which men and produce can be transported a mile in two minutes, is of far more importance to the world than the crossing or recrossing of the Balkan; and that it was the inventors, in England, 'of its cotton engines, and its steam engines, who subsidized nations, and gained Waterloo.'

"It is thus," he added,

> that knowledge, scientific knowledge, doubly becomes power. To nations, by machinery alone, it sometimes outstrips, in benefits, all calculation, and even imagination. The steam power in England, as far back as A.D. 1828, is said to have equalled that of two millions of men; and, in the cotton manufacture alone, in that country, there was accomplished by machinery of every kind what would require the labor of forty-two millions of men.[21]

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[20] "Darby's View of the United States," V (1829), 144.

[21] "Importance of Science in the Arts" (1831), in Writings, III, 16-17.

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Accordingly, applied mechanics becomes a principal agent in the advancement of civilization, and "the Steam Engine ... almost as important as the plough."[22] Daniel Webster found machinery saving human toil "to an extent that astonishes the most sanguine, with a degree of power to which no number of human arms is equal." With his customary oratorical fervor, he spoke before the Boston Mechanics' Institution in 1828 of how "every natural agent is put unrelentingly to the task."

> The winds work, the waters work, the elasticity of metals works; gravity is solicited into a thousand new forms of action; levers are multiplied upon levers; wheels revolve on the peripheries of other wheels; ... and, last of all, with inimitable power, and 'with whirlwind sound,' comes the potent agency of steam. In comparison with the past, what centuries of improvement has this single agent comprised in the short compass of fifty years![23]

A machine that can do the work of many men is a cogent, vivid symbol to enforce the Baconian moral. A steam engine is so blatantly expressive of the power of knowledge based on scientifically ascertained facts--so impressively demonstrative of the application of that power to the extension of man's dominion over nature! "An American," said Robert Southey caustically, "when he speaks colloquially of

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[22]Zachariah Allen, op. cit., Preface, p. iv.

[23]Writings and Speeches, II, pp. 35-36.

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power, means nothing but a steam engine."[24] The American Quarterly, making a virtue of alleged fault, countered with the remark that, sharing sovereignty with "republicanism," steam "will govern the world,--'mitrum et nitrum', the mitre and gunpowder, having had their day."[25] New York's enterprising lecturer, John Griscom, who seemed to have spent the greater part of a trip to Europe between 1818 and 1819 admiring factories, canals and cabinets of natural history,[26] could be moved to religious sentiments by a "steam engine ... of 72 horse power ... supplied by five boilers, four of which were in constant use." Declared Dr. Griscom:

> The beauty and perfection of the machinery, and the quiet and steady operation of so powerful an engine, cannot be viewed without an emotion of reverence for that genius which can so control the operations of nature, and combine, with such wonderful harmony, so many apparently discordant and opposing movements, and bring them all into subservience to the use and convenience of mankind. Can it be possible that any man can contemplate such a train of machinery--can witness effects so vastly remote from the original impulse, and regard all this as the offspring of thought and reflection, and yet remain a materialist![27]

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[24]Quoted in "Southey's Colloquies," Am. Quar. Rev., VI (1829), 63.

[25]Ibid., p. 64.

[26]Year in Europe, passim.

[27]Ibid., II, 533.

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Renwick, endeavoring to impress a New York audience with the power of the steam engine, pointed out that it enables a man to spin "one hundred times as much yarn as he formerly could have done, even with the help of a machine"; and that

> there are manufactories in England, moved by steam engines, in which the quantity of yarn produced daily, would extend a distance equal to twice the circumference of the globe.

Why, "a countryman of our own has invented an engine propelled by steam, that manufactures 60 pins per minute."[28]

Speaking in 1828 before the Dartmouth chapter of Phi Beta Kappa, Dr. Frederick Hall of Washington College also enthused over the virtues of the steam engine. Here, he exclaimed, quoting the noted Professor Playfair, is

> 'the most remarkable engine to which science has ever given rise;'--an engine which, if we may confide in the calculations of an able writer, saves to England, the labour of two millions of men;

an engine by which,

> 'each individual of our feeble race becomes stronger than Hercules, mightier than Jove.'[29]

And Silliman in his introductory remarks to the first volume

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[28]"Renwick's Introductory Lecture," New-York Review and Atheneum, II (1826), 104-105.

[29]Oration on the Importance of Cultivating the Sciences, pp. 14-16.

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of the Journal of Science added his praise of the steam engine as the very symbol of the momentous rôle of science wedded to the arts--acclaimed it the

> legitimate child of physical and chemical science--at once more powerful than the united force of the strongest and largest animals, and more manageable than the smallest and gentlest; raising from the bowels of the earth the massy treasures of its mines, drawing up rivers from their channels, and pouring them, in streams of life, into the bosom of cities; and, above all, propelling against the currents, the winds, and the waves, of the ocean, those stupendous vessels, which combine speed with certainty, and establish upon the bosom of the deep the luxuries and accommodations of the land.[30]

The age was prolific in such pæans to the power of steam--to such an extent, in fact, that by the end of the second decade the American Quarterly could pronounce the subject "hackneyed and familiar." However, this does not restrain the Quarterly; it felt keenly the subject's importance. For the steam engine is, of course, a remarkable instrument:

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[30] Pp. 7-8.

> At this point enters an ominous note: The successful execution of this magnificent design was first witnessed upon the waters of the Hudson, but is now imitated in almost every civilized country; and it remains to be seen whether they will emulate us by transporting, by the same means, and against the same obstacles, the most formidable trains of artillery.

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> remarkable for its force and for its versatility; it cannot only lift the heaviest and crush the most refractory substances, but is capable of being directed and regulated in such a way as to perform the nicest operations of manufacturing industry.

It is seen "slitting steel into ribbands, and impelling ships against the united force of the winds and the waves"; and again, "spinning the wool of Saxony and the cotton of Georgia."[31] "It is a new and unknown force introduced into the labors of man," George Burnap told the Maryland Academy of Science and Literature in 1841, "of which we have seen the beginning, but no mortal eye can see the end."[32] Young men in American colleges were reading in their Enfields of the "high importance of this machine," of its "immense" power--its ability to "raise more than 20,000 cubic feet of water, 24 feet high, for every hundred weight of good pit coal consumed by them."[33] Edward Everett anticipated that "within no distant period" it would "produce the most essential changes in the social condition of the world."[34]

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[31] "The Steam-Engine," VI (1829), 409.

[32] Op. cit., p. 215.

[33] (Boston, 1820), pp. 113-114.

[34] "On the Importance of Scientific Knowledge," in Orations, I, 271.

The Erie Canal likewise served to illustrate the power of modern Prometheus. Thus that constant eulogizer of the commonplace, New York's journalist-versifier, Samuel Woodworth, hailed the canal as

> The triumph of science o'er matter and space!
>
> "The Grand Canal," in Poetical Works, I, 251.

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For the Reverend Timothy Flint, man's "capacity to invent mechanical improvements, and convert the blind but untiring and prodigious powers of nature to his use," was a "cheering" factor, contributing to his faith in progress as part of Divine intent.[35] This age, according to Flint's Western Monthly Review, will be remembered by the fruits of that knowledge which is power:

> The application of steam power, the making of canals and the construction of railways, their utility, the changes they have already wrought and are continually working on the face of society, these are the great features, by which the present age will be marked in history.[36]

No longer, observed William Channing, is science mere speculation; it is now

> sought as a mighty power, by which nature is not only to be opened to thought, but to be subjected to our needs. It is conferring on us that dominion over earth, sea and air, which was prophesied in the first command given to man by his Maker.[37]

And so through the decades was echoed and reëchoed the fundamental Baconian maxim. Governor Clinton, having proclaimed the 'unbounded prospects' of science before the New York Linnaean Society, urged his audience to take up "the duties of the day, ever bearing in mind that science is

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[35] Lectures upon Natural History, p. 405.

[36] I (1827), 161.

[37] Works, VI, 153.

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honour, and that knowledge is power."[38] The Reverend John Russell of Hingham spoke before the American Institute of Instruction of that knowledge gained by observation of nature, which "is capable of conferring by a proper use an immense and fearful power."[39] Edward Everett explained that "knowledge is power," and that "it is power because it is usefulness."[40] A reader of the American Library of Useful Knowledge would have been able to find in the first volume the opinion of the noted J. W. F. Herschel that man must study the laws of nature, since it is only by understanding those laws that he gains power over nature and hence advances civilization.[41] And in the same publication he would have encountered, among the strongly Baconian views of Lord Brougham, a tribute to Bacon as "the miner and sapper of philosophy, the pioneer of nature," and indeed, "the priest of nature's mysteries--the first who taught ... the way in which we should begin and carry on our pursuit

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[38]D. Hosack, Memoir of DeWitt Clinton: with an Appendix Containing Numerous Documents, Illustrative of the Principal Events of His Life (New York, 1829), pp. 151-152.

[39]"On the Study of Natural History," American Institute of Instruction Lectures, 1837, p. 76.

[40]Orations, I, 309.

[41]"Discourse on the Nature and Advantages of the Study of the Physical Sciences," in American Library of Useful Knowledge, I, 295-320.

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of knowledge, in order to arrive at truth"--and thus to promote "the dominion of man over the material world."[42] Professor Alonzo Potter of Union College, using as his scholium Pope's dictum on the danger of a little knowledge, voiced his conviction that "what in the true sense constitutes knowledge--that knowledge which is emphatically power," is no "little" knowledge but great knowledge--knowledge which "reveals to a man the constitution of the external world, and of his own frame, and of civil society, and gives him power with respect to them all. It is, he goes on to explain, "Chemistry, with all the power it gives us in bleaching, dying [sic], tanning, sugar-refining, etc., etc." It is

> the philosophy of Steam, of Electricity and Galvanism, of the true functions of our muscular and nervous organization, of Botany and Geology, with all the control which these give us, over the operations of nature, and the workings of our own system.[43]

"All my remarks," adds the Reverend Potter,

> are but a commentary on the celebrated maxim of lord [sic] Bacon, that knowledge is power; and let me add, that for the human race there is no other power.[44]

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[42]"Account of the Novum Organon," pp. 207-208.

[43]Address Delivered December 9th, 1835, before the Mechanics' Literary and Benevolent Society, of Poughkeepsie, at the Opening of Their First Course of Lectures (Schenectady, 1836), pp. 17-18.

[44]Ibid., p. 24.

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And it is to the extension of this power, argued a correspondent of the Southern Literary Messenger, that the Smithsonian Bequest must be devoted: and hence, not to a literary institution, but to a "Central School of Natural Science, in the City of Washington." Already, in this writer's opinion,

> the philosophy of Verulam has created a new race of mortals;--a race utterly different, both in physical power and in intellectual refinement, from all other animals on the face of the earth.

"Each year, as it passes," he adds, "is rapidly increasing the difference."

> One after another, we are subjecting the imponderable and unseen agents of Nature to our use--Heat, Electricity, Light. Men that are thus arming themselves with the force of these elements, are not like the former inhabitants of the globe.

"Who can predict," he asks, "what the course of a few years shall accomplish?"

> The man who is grasping in his hand the agents with which it pleases the Almighty to govern this world--who has made for himself an eye that reaches into the deep abysses of space, and sees the circling of star around star, in regions which the eye of an angel alone could pierce--whose splendid intellect compares together the weights of those indivisible atoms ... of which the Creator has formed all material things,--the man, who instead of indulging in chimerical speculations about the structure of his own mind, of which he is in utter ignorance, is adding to himself new senses which are unlike those that nature has given him, and expanding his organs to

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> the production of results which his unassisted powers could never have approached; this is not the man who existed five centuries ago.[45]

In such Baconian declarations of faith there is more than a suggestion that the promise of 'knowledge' is not to be limited to power over the material world. And in other writers of the period the inclusive applicability of the Baconian aphorism received clear affirmation. John Gallison, for example, reviewing Bristed's Resources of the United States (1818) for the North American Review explicitly extended that promise to social power. He proclaimed the advance of political philosophy (and for Gallison the sum of political philosophy is apparently political economy) as the fruit of the age's indefatigable data-collecting.

> From the greater number and more accurate observation of facts, its conclusions have been formed with greater certainty, and applied with more confidence to practice.... In truth, it would be hardly too much to say of this philosophy, that it has disclosed a new power in society to promote the happiness, and moral elevation of its members.[46]

Two years before, also in the North American, Josiah Quincy had deplored the neglect of statistics and political economy in the United States, and had argued that sound governmental policy could only be achieved after the collection and study

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[45]"Smithsonian Institute," VI (1840), 29.

[46]VII (1818), 401-402.

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of factual data.[47] Even William Channing, although somewhat apprehensive lest unrestrained faith in science lead to pride and godlessness, felt constrained nevertheless to admit that its power is being demonstrated in all spheres of human activity. "Science has burst all bounds," he asserts,

> and is aiming to comprehend the universe, and thus it multiplies fields of inquiry for all orders of minds.... Not content with exploring

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[47]"A Statistical View of the District of Maine, &c.," III (1816), 362-369. In his Dane Law School Address (pp. 6-10) we find Quincy discussing law as a "well-defined science."

In 1820 the editor of the Port Folio (IX, pp. iv-vi) announced his intention to bring statistical reports to his readers. He deplored the neglect, in the United States, of the "science of statistics," which he defined as

> that science which communicates facts, relating to the progress and present state of Arts, Trades, Manufactures and Professions; of Agriculture, Commerce, Finance; of the Forces of a State, Military and Naval; of its Seminaries of Education, its Publick Establishments, its Taxes, Revenues and Population.

If this work is sufficiently encouraged, he prophesied,

> we may probably possess facts sufficient to lay a ground-work for our reasonings in political economy; we may see the light reflected from one fact upon another; trace the sources and means of public improvement and national prosperity; bring accurate knowledge and connected facts on the floor of legislation, and take our steps in the light of day.

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> the darkest periods of human history, it goes beyond the birth of the human race, and studies the stupendous changes which our globe experienced for hundred[s] of centuries, to become prepared for man's abode.... Above all it investigates the laws of social progress, of arts and institutions of government and political economy, proposing as its great end the alleviation of all human burdens, the weal of all the members of the human race.[48]

In this respect could there be greater optimism than George Kent's? "The whereon to stand being given," he wrote in 1830, endeavoring to characterize the age,

> it matters little in what clime or on what continent--the power to move systems and worlds, mechanically, and morally and politically, is incident to the lot of many a once humble individual.[49]

There is little more in essence for scientific naturalism to claim. There is here no evidence of a suspicion that "law for man" and "law for thing" may be somehow discrete. The point of view expressed is concentric within the area of scientific naturalism. Just as man is to have the power, through the agency of scientific method, to control social development, so likewise is he to achieve control over individual development--over the growth of human personality. Gall and Spurzheim with their followers did not want for audience and prestige in these years. Great

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[48] Works, VI, 153-154.

[49] Op. cit., p. 4.

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were the fruits anticipated from the application of the inductive method to the "philosophy of mind"; too much could not be expected from that intellectual instrument which had "blessed and gladdened" the human species with the mariner's compass, the miner's safety lamp, the vaccine virus, the steam engine and Newton's theorems. Should we not then be sanguine about the potentialities of a scientific analysis of mind? Certainly "the march of mind" and the march of our knowledge of mind could be expected to accompany each other.[50] And although it might be true that "intellect governs the world," the instrument of its governance is science; and further, since reason is the source of moral suasion, then science in enhancing the power of reason becomes, itself, a moral force.[51] Virtue is a question of knowing the 'facts.' "We may not only assert that knowledge is power," declared Robert Rantoul before the American Institute of Instruction, "but also that KNOWLEDGE IS VIRTUE."[52] So ran, and still runs, the Baconian argument. That it should effectively appeal to a people bred in the Puritan tradition is not surprising, despite the

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[50] Cf. [S. Gilman], "Brown's Philosophy of Mind," N. Am. Rev., XIX (1824), 1-41.

[51] James Gould, op. cit., pp. 3-6.

[52] Memoirs, p. 128.

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moral dualism inherent in that tradition; for it offered science as an unprecedentedly efficient ally of morality, both as a power equated with moral power[53] and as a promoter of labor and usefulness: that is, of the morality of making two blades of grass grow where one grew before.[54]

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[53]Not all ministers were as ready as Potter, Dewey and George Emerson to accept man's increasing power as an unmitigated blessing. Mark Hopkins, for example, felt some apprehension about the tendency of a Baconian world to nourish man's desire for unlimited self-expansion. "The power of man over nature," he wrote in 1855,

> is now greater than at any former period; invention is laying the labor of man upon the untiring elements; steam is hurrying forward our merchandize, and turning the wheels of our machinery, and reaching long arms into the bowels of the earth, and bringing up for us its treasures. Every thing that can minister to the appetites, and foster pride, and pamper luxury, and stimulate and give facilities to ambition, offers itself to easy acquisition. There is a tendency to measure the progress of the age by these external means of enterprise and enjoyment.... If, under the excitement of all that can stimulate the lower nature of man, the principles of his moral and spiritual nature do not receive a correspondent expansion, and vigor of action, there can be nothing to control the fierce and thickening struggle of conflicting interests, and we shall but furnish another, and a signal illustration of the truth of that saying of the wise man, 'The prosperity of fools shall destroy them.' "On Originality," Miscellaneous Essays and Discourses (Boston, 1847), pp. 99-100.

William Ellery Channing, Philip Lindsley and Henry Ware, Jr. would have agreed, even though they too believed that man was destined to progress--and to do so with the help of the 'knowledge which is power.'

[54]"Industry is a very eminent virtue, being an ingredient, or the parent, of all other virtues...." From the Reverend Barrow's sermon, "On Industry," quoted in the Port Folio, XVII (1824), 492.

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CHAPTER VII

The Spirit Naturalized

i

For the Baconian, then, "knowledge is power" was also spoken of the soul. He believed in the power of 'the only true mode of philosophizing' to promote the spiritual and intellectual welfare of mankind. Already distinguished as a motif in the Promethean theme was the idea that accretive influences of science and technology aided the moral and mental progress of mankind. Numberless reprints, abridgments, redactions and imitations of Paley signalized the faith that science could feed the fount of piety. And it was as much to the 'mind-liberating' influences of science as to the enlightenment of Christianity that the alleged intellectual superiority of the modern era was attributed. However it was the direct application of scientific method to the study of man himself that seemed to offer the highest promise of power to perfect his faculties. To understand adequately the processes of mind--of all man's conscious activity--would be to place man in control of man. Knowledge

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is power: efficiency, comprehension, morality, human destiny--all might some day be wedded to human desire. If too dazzling a dream for more than a few unusually 'tough' Baconians of the period, it is nevertheless implicit in most.

True, those who shared such naturalistic anticipations did not feel that they had therewith embraced materialism. In fact they very generally resented and repelled all imputations of physical monism. Those among them who were prepared to follow that disciple of Gall and Spurzheim out of Edinburgh, George Combe, engaged to their honor that they were supplementing Paley and Scripture with their phrenological index to personality.[1] God had not been relegated to the purlieus either of mythology or of Principle.[2] The old framework of thought, held together by faith, was retained--if at times somewhat perfunctorily. The Scottish school of philosophy, for example, was inherently naturalistic, but no one could accuse Reid, Stewart and the others either of pantheism or of atheism. Principles which are 'ultimately beyond our capacity to explain'

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[1] Vid. infra, pp. 211-223.

[2] Robert Owen's reduction of God to a Principle was, in fact, a major bone of contention between himself and others no less Baconian in fundamental respects. Vid. infra, pp. 247-251.

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are explicitly placed by Stewart under "the will of our Maker."[3] Yet the sense of man's power over himself was nevertheless grown strong; strong was the belief that the scientific method offered the key to his most secret mechanisms. And when we have given the spirit of man over to 'inductive science,' have we not consequently agreed to consider it no deeper-rooted than in natural law?

Apparently no more than theological preconceptions did philosophical considerations of mind-body dualism prevent the development of a naturalistic bias. Certainly the dualism persisted; but mind and matter, howbeit decreed different in kind, were deemed equally investigable by scientific method. One cannot mistake in its simple directness the explanation on this point presented by the Juvenile Philosopher published at Geneva (New York)[4] as a school "manual relating to the elements of natural science."[5] Although we read there, among the preliminary definitions, that

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[3]Elements of the Philosophy of the Human Mind (2 vols. in one, Albany, 1822), I, 182.

[4]1826.

[5]Pref., p. xi. It also served as a minor Paley. The title-page bears these lines from Milton:

> These are thy glorious works, Parent of good,
> Almighty! thine this universal frame,
> Thus wondrous fair; thyself how wondrous then!

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> nature, or the system of things which exist may be distinguished into two classes totally different from each other; viz. bodies or matter, and spirit or mind;

nevertheless we are at once apprised that

> by observation and reflection we derive a knowledge of the properties of matter, and of the faculties and operations of mind.[6]

True, there follows immediately an admission that the scope of the inductive method is limited, and that man remains "ignorant alike of the true essence of body and of mind."[7] Yet this is nothing more than the orthodox Baconian concession whose corollary, that the wise man will devote his attention to the knowable, bears as its sequel a relegation of Final Cause, or ultimate purpose, or God, to that area of the unnecessary which shoulders the area of the nonexistent. Indeed there was portent in the information offered by this selfsame Juvenile Philosopher that science has discovered "a remarkable analogy between the galvanic influence and the nervous influence," and that

> hence it has been conjectured by physiologists, that electricity may be concerned in some of the most mysterious phenomena of vitality; that animals and plants are subject to the influence of this active and subtle agent.[8]

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[6] P. 13.

[7] Loc. cit., also p. 18.

[8] Pp. 85-86. Note also that the Juvenile Philosopher gives us (p. 13) what was then a general denotation of the word, philosophy: "the knowledge of nature applied to practical and useful purposes."

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President Allen of Bowdoin indicates that this idea could permeate the thought even of a very pious gentleman extremely conscious of man's ignorance in comparison with Divine Wisdom. To the graduating class of '22 he suggested the possibility of it being

> demonstrated, that what is called the nervous influence in the animal economy,--the instrument, by which the mind operates upon the body,--the messenger, which the mind on its throne despatches to the extremities of its empire,--is the galvanic fluid itself, and that this fluid is elaborated or secreted by the brain.[9]

The Reverend Allen's ready qualification, that

> even this addition to our knowledge would lead to new questions, which are unanswered, and perhaps unanswerable in our present state of being,[10]

would be inadequate grounds for distinguishing him fundamentally from, say, the phrenologist Spurzheim who likewise accepted the unknowability of essence.[11] Lord Brougham was

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[9]"The Ignorance of Man," in A Decade of Addresses, Delivered from 1820 to 1829, to the Senior Classes at Bowdoin College; Together with an Inaugural Address: to which is Added a Dudleian Lecture, Delivered May 12, 1830, at Harvard University (Concord, 1830), p. 62.

[10]Loc. cit.

[11]Thus J. G. Spurzheim in his Natural Laws of Man, a Philosophical Catechism (6th edition, New York and London, 1851), pp. 33-34:

> Can we, by reasoning, arrive at conclusions on the nature of that which knows, on its manner of acting, or on its final destination?

[Continued on p. 188]

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pious too. He produced a Natural Theology.[12] But Lord Brougham also contended that all subjects

[Footnote 11, contd.]

> These are purely subjects of religious belief, and history shows that opinions, the most contradictory and unlikely, have been promulgated and received in regard to them.
>
> What conclusion is to be drawn from this fact?
>
> That every individual is to have full permission to believe that which to him seems good and proper, provided neither individual nor general happiness be compromised.
>
> Announcing the fact--Man Knows,--what points are especially to be attended to in examining his knowledge?
>
> It is necessary above all things to determine accurately that which he can, and that which he cannot know; to specify the various sorts of knowledge, and indicate the conditions under which each may be acquired; to establish the natural laws, or the regularity with which every thing happens; and thus to found on a sure basis the happiness of individuals and of the human kind.
>
> What can man know?
>
> Strict reason demonstrates that he only knows his individual identity, and the modified conditions of his self. Plain sense says that man knows, first, his existence, many parts which constitute his frame, many internal functions, called feelings and intellect, or affective and intellectual faculties;--Moreover, that he knows a great number of external objects, as existences, that he further knows their physical qualities, their mutual relations, and their relations with himself and with others; lastly, that he knows regularity, or the laws of all the knowledge he possesses.

And further (p. 37):

> What is it impossible for man to know?
>
> It is certain that he can know nothing in itself, neither the essence of his own nature,

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> relating to moral and intellectual philosophy, are not less properly and strictly within the sphere of the operation of the Baconian method, than the more tangible properties of matter itself, and the laws of the material universe in general.[13]

[Footnote 11, contd.]

> nor that of external objects. The self of the conscious man is nothing more to him than an object of observation. Farther man cannot know, either the beginning or the end, or final destination of aught that is; he can only observe what is, the conditions under which it is, and the regularity with which the phenomena happen. His knowledge is merely phenomenal.

[12] A Discourse of Natural Theology, Showing the Nature of the Evidence and the Advantages of the Study, 3d edition, London, 1835.

[13] "Account of Bacon's Novum Organon," in American Library of Useful Knowledge, IV, 63.

In fact, Brougham includes religion in the sphere of the Baconian method. In his Discourse of Natural Theology we read (pp. 49-51) that "the modern analysis or induction taught by Bacon and practised by Newton" is as applicable and valuable in developing a knowledge of God, as it is in supplying knowledge concerning prehistoric animals from "a few bones, or it may be a single fragment of a bone."

Likewise the British divine, George Payne, in his Elements of Mental and Moral Science (New York and Boston, 1829), Pref., vii-viii:

> He [the author] has endeavoured to examine the substance mind, as we examine the substance gold; and he has ascribed no properties to it but such as in this manner he found, or, at least, fancied he found it to possess. He has certainly rejoiced to see that what he regards as the true principles of Mental Science, are in union with those views of revealed truth, which appear to him of great and paramount importance; his faith in both has been confirmed by the discovery of the alliance. Yet it would be to do injustice to the Work to

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President Wayland of Brown argued similarly that the moral and intellectual, as well as physical, welfare of man is contingent upon the use of scientific method to ascertain the laws governing his life. "The laws of the universe must be discovered," he declared.

> Until they are discovered, we shall be continually violating them and suffering the penalty, without either possibility of rescue or hope of alleviation.... Hence the interest which every man should take in the progress of knowledge. Who can tell how countless are the infelicities which have been banished from the world, by the discovery of the simple law that a magnetized needle, when freely suspended, will point to the north and the south!

Of course, he acknowledges that it is insufficient merely to know the Creator's laws; one must obey them. And it is here, observes the Reverend Wayland, that we enter "the mysterious region of human will, of motive, and of conscience"--here that "some great improvement" is needed. For the achievement of greater coördination of will and intellect, he looks to an improved system of education. But for that, in turn, he depends upon scientific method! As we shall see in the discussion of education to follow,

[Footnote 13, contd.]

> suppose that it attempts to found a system of Mental Philosophy on any peculiar religious opinions. It is inducted on philosophical principles; and it respectfully invites the candid attention of the man of science, as well as of the friend of religion.

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the Baconians were to complete the jurisdiction of science over the mind and heart by means of a 'scientific pedagogy.'[14]

As the first step, however, the Baconian method had to be extended to the study of mind. "Is it then true," poses a reviewer in the orthodox Quarterly Christian Spectator, "that the laws of the operations of the mind, are not susceptible to reduction to order and system?" This he, for one, is "far from asserting or believing," although aware that

> the task of throwing the researches of the last two centuries on the subject into the form of a regular science ... is indeed an arduous one.[15]

Samuel Gilman, reviewing Brown's Philosophy of the Human Mind, looks forward to the day when a youth may be provided with "a grammar or accidence of the mind" explaining thoroughly the operations of his intellect.

> Should it be incredulously asked, if such things can be expected at this late period of the world, we would inquire in return, how long, on the one hand, the species may

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[14] An Introductory Address, Delivered in Boston, before the Convention of Teachers and Other Friends of Education, Assembled to Form the American Institute of Instruction, August 19th, 1830 (Boston, 1830), pp. 6-19. We find Wayland inextricably merging science and man's spiritual status in A Discourse Delivered at the Opening of the Providence Athenaeum, July 11, 1838, Providence, 1838.

[15] II (1830), 2.

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> yet hope to exist, and, on the other, how long the circulation of the blood has been discovered?[16]

He envisions man as the subject of investigation coöperatively pursued according to the Baconian recommendation for fruitful labor. "When hundreds of solitary thinkers," he writes,

> have turned their attention inwards to survey the operations of their own individual intellect, compared with what they know of others, and have classified, as well as the evanescent and impalpable nature of the subject will permit, those laws of thought and emotion, that may be gathered from their combined internal experience and foreign observation, at length some master philosopher of the mind avails himself of the labors of his predecessors, and employs their recorded results to mould into a new frame and aspect this keystone of the sciences.

Which hypothesis is integrated with the idea of perfectibility; for we are told that

> when sciences, which are now unthought of, shall arise and be carried to perfection, calling forth mental powers as yet unexerted and unknown, and when perhaps new combinations and exhibitions of moral excellence shall brighten the face of society, the faithful philosopher of the intellect will stand ready to arrange these freshly created materials in his ever growing system.[17]

Another reviewer, writing for the North American in 1836, insists that mental and moral philosophy can and should be

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[16] N. Am. Rev., XIX (1824), 7.

[17] Ibid., pp. 8-9.

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made a truly effective science even as any of the physical sciences. "There is no reason," he declares,

> why a theory of the mind should not be constructed, that shall be, to use the words of the Father of the Inductive Philosophy, 'not vague and obscure, but luminous and well-defined, such as nature herself would not refuse to acknowledge.' ... let them take into view all facts which they can collect directly and indirectly bearing on their subject, whether immediately relating to the brute creation or to man, to the bodily organization or to the mind, to men of this or that rank, age, or nation; let them discard that 'science falsely so called,' which seeks to solve questions to which the human mind is unequal, to explain the mysteries of Fatalism or Materialism; in a word let them but deal with facts in their department, as other men already do in every other branch of science, and the work is done.[18]

He would have it "a real and useful science, and admitted as such into our schemes of education." For if man is ever to be improved, he argues, it will only be when we know the nature of the material with which we are dealing, together with the principles that should guide and the instruments that should be used. And these must be ascertained scientifically; that is, by reasoning based upon observation.[19]

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[18] XLII, 354.

[19] Ibid., pp. 355-356.

Note also: "Outlines of Philosophic Education," Academician, I (1819), 339:

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The condition of society no less than the nature of the individual was felt to be susceptible to improvement

[Footnote 19, contd.]

> Though LORD BACON directed the application of the Inductive method of reasoning chiefly to the discovery of the laws of the material world, it may, notwithstanding, be also applied, in its leading principles, at least, to investigate the properties of the laws of mind.... Mr. Locke, in his essay on the human understanding, trod exactly in the path which LORD BACON had pointed out. Dr. Reid, the follower of Mr. Locke, has left us some excellent specimens of the Baconian Logic, on intellectual and ethical subjects, and prove, by their successful use both of analysis and synthesis, that this mode of investigation may be profitably pursued in the philosophy of mind, as well as in that of body.

One writer in the American Journal of Education, IV (1829), having "acknowledged" Bacon "as the father of the inductive system, and our great master in philosophy (p. 133)," goes on to state later in his discussion of Bacon's principles (p. 193):

> We express our strong conviction when we say, that Reid, and Stewart, and Brown, though they have built up what is called a philosophy of mind, upon induction, have yet but skimmed the surface of the profoundness of Bacon's views.

Walter Johnson at one time declared that

> by learning to bring the principles of nature and of art to the test of experiment, the diligent cultivator of practical science becomes habituated to regard with most favor those precepts of moral conduct which will best bear the same test; and to look with distrust on those which shrink from such a trial.
>
> "On Schools of the Arts," American Institute of Instruction Lectures, 1835, p. 291.

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directly through the application of scientific method. The American Quarterly is enthusiastic about the progress already made in this direction. We are informed that only fifty years after the publication of the Wealth of Nations, political economy has been placed "among the sciences":

> its chief laws have been investigated, and founded on the firm basis of the acknowledged principles and feelings of human nature.... The statesmen of the day are gradually adopting its principles, and the period may be sanguinely anticipated, when the policy of nations, external and internal, shall be guided by its maxims.[20]

And the learned president of South Carolina College, Thomas Cooper, is equally convinced that a positive science of society is attainable:

> The laws of mechanical and chemical philosophy, when investigated and accurately determined, are known to operate with sufficient certainty to enable us to predict from the assemblage of circumstances that immediately precede an event, the nature of the event which is about to follow. I believe it may be considered as universally true, that like antecedents produce like consequents. We acknowledge this in the physical world, but we are not sufficiently aware that the same axiom holds true in what is called the moral world also; and that the mind of man, and the motives that operate upon him, are not independent of all laws, and subjected to no reasonable calculation a priori, but that the actions of human beings are influenced by the circumstances that precede them and produce them, to a degree quite

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[20] II (1827), 47.

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> sufficient to permit us on a large scale to predict, explain, and account for, the usual conduct of men in society, from the motives to which they are exposed.

On this basis, and as already indicated by advances in political economy, mankind may look forward to social control:

> Political economy therefore, which analyzes the transactions and dealings that take place between men who are combined in a political community is not a science of conjecture, but of facts and consequences: as dependent the one upon the other, as the falling of a stone to the earth, on the principle of gravitation. Doubts and mistakes have arisen and may arise, when the antecedent circumstances are partially, and imperfectly observed, and when conclusions are deduced from incomplete premises. This happens in every science. But the minute and careful investigation which the several parts of this extensive subject have received within the last twenty years, has shewn us, that by degrees we may attain to certainty in proportion as we aim at accuracy; and that much of that knowledge which was formerly dubious, may now be stated in the form of elementary truths, settled and incontrovertible.[21]

Calhoun cannot find it in his heart to believe that the "high power of the mind" of man "which has effected such wonders when directed to the laws which control the material world," can "be for ever prohibited ... from being applied to the highest purpose of political science and legislation." "I hold them," he contends,

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[21] Lectures on the Elements of Political Economy (2d edition, Columbia, S.C., 1829), pp. 35-36.

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> to be subject to laws as fixed as matter itself, and to be as fit a subject for the application of the highest intellectual power. Denunciation may, indeed, fall upon the philosophical inquirer into these first principles, as it did upon Galileo and Bacon when they first unfolded the great discoveries which have immortalized their names; but the time will come when truth will prevail in spite of prejudice and denunciation, and when politics and legislation will be considered as much a science as astronomy and chemistry.[22]

As already suggested, the Baconian trust in a complete application of scientific method to human concerns received sanction and strength from a conviction of moral efficacy: Virtue is a question of knowing the 'facts.' The alliance of 'inductive philosophy' and morality produced reformers such as that lecturer on the 'science of right living,' Sylvester Graham, who felt that there could be no greater persuasive to morality than scientifically ascertained facts about the constitution of man. Accordingly, being zealous in the cause of temperance, he studied physiology and then assumed his messianic burden as a lecturer on that subject. "Know thyself" is the motto gracing the title-page of Graham's published lectures (1839);[23] and knowing

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[22]"Speech on the Revenue Collection (Force) Bill (1833)," in Works, II, 232-235.

[23]Lectures on the Science of Human Life (Boston, 1839), I, Pref., v-vi. Here we are informed that Graham embarked on his lecture career after having become general agent of the "Pennsylvania State Society, for the suppression of the use of Ardent Spirit." In 1830 he delivered lectures on

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one's self--the foundation of a 'true system of life'--is thereafter plainly demonstrated to be a matter of induction from carefully observed facts.[24] Upon that must depend the cogency of appeals to moral living, together with the power to control the growth and disposition of intellect, will and conscience. The moral efficacy of scientific method rested, then, upon a twofold argument: on the one hand, the claim that right reason will guide[25] when scientifically informed (i.e. when made aware of the operations of natural law), and on the other the claim that scientific knowledge of the human constitution will also provide man with the power of self-government, by placing under his control the operation of natural law as it affects him physically, mentally and morally. In the naturalistic

[Footnote 23, contd.]

"human physiology, diet and general regimen, at the Franklin Institute," and before he had completed that course, was invited to New York City to lecture. Thereafter, requests for his lectures became so numerous that he decided to engage regularly in them. Ibid., p. vi.

[24]The two volumes of the Lectures try to impress the reader with the necessity of living in accord with principles derived from scientific study of the human organism. Cf. ibid., I, 34.

[25]Involved here, of course, is the age-old question of the respective rôles of reason and faith in the guidance of man; but in our era this difference obtains: reason in its own might is not advocated, but reason directed, supported, enlightened by scientific method.

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position all three aspects of man were integrated. Hence . . . Graham's faith in dietetics--his belief that

> the simpler, the plainer and more natural the food of man is, the more perfectly his laws of constitution and relation are fulfilled, and the more healthy, vigorous and long-lived will be his body--the more perfect his senses, and the more active and powerful may his intellectual and moral faculties be rendered by suitable cultivation.[26]

The naturalistic assumption underlying this view becomes clear in Graham's distinction between the "rude" or savage and the "pure state of nature," the latter being

> the truly natural state of man, or that state to which God has adapted the constitutional nature of man ... that, in which his organic and animal powers, and all that primarily appertains to his organic and animal nature, are kept in strict conformity to the physiological laws of that nature, and in which his intellectual and moral powers are cultivated in godlike wisdom and virtue.[27]

Discover the natural laws governing man, adjust him in harmony therewith,[28] and the millennium is achieved! That is

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[26] Op. cit., II, 17-18.

[27] Ibid., II, 17.

[28] Note, also, the Reverend Orville Dewey:

> We see human beings, as they now are, instead of going on harmoniously with the system of things around them; instead of conforming to the laws of their own constitution; instead of acting with decision, wisdom, and skill, in circumstances expressly designed to call forth these qualities,--we see them at war with nature, and not only so, but contending at a disadvantage, floated and

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the supreme task of science. But in order to limit man's intellectual and moral nature by laws that are subject to scientific investigation, the scientific naturalist is led perforce to reduce that nature to material substance. Thus we have Graham asserting that

> whatever be the substratum of the sensorial power of the human brain, it resides in and acts through the organized matter of the nervous system;[29]

and further that the "seat of the human soul" is "unquestionably" the brain.[30] Graham's effort to reconcile his naturalistic position with Christian precepts resulted only in further identifying of spiritual and natural law.[31]

[Footnote 28, contd.]

> buffeted by the elements, without the needful safeguards, misled by appearances, troubled by mistakes, overcome by accidents, often sick from the want of care.
>
> "Diffusion of Knowledge," N. Am. Rev., XXX (1830), 306.

[29] Ibid., I, 358.

[30] Ibid., I, 359.

[31] As a result of his desire to square a naturalistic point of view with Christianity, Graham is led to concoct a curious mixture of Scottish philosophy and physiology. (For an element of Lockean sensationalism in his thought, cf. I, 14-15.) Having inserted the laws of man's constitution in matter and placed them on the same plane as the "constitutional laws common to the elephant," he was confronted with the felt need to take into account, volition, intellectual direction, moral discrimination--in general, what are termed the spiritual powers. What he did was to keep man and animal subject to the same laws, but to give man freedom of choice with respect to those laws and to make

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One stout-minded Baconian of the period, writing in 1855 for the Portland Magazine, made no effort to conceal the fact that he had dissolved spirit in matter. Firmly and explicitly he was against excessive preoccupation with things that belonged in the realm of faith. Convinced that scientific knowledge is superior to faith as a means of moral reform, he advocated that man confine his investigation of himself (as he had of the world about him) to the demonstrable. Indeed, he warned, theology may actually

[Footnote 31, contd.]

his inferior brethren obliged to obey them through instinct. Man may obey or disobey--in fact, has a penchant for disobeying. This does not, it should be remarked, alter the nature of the laws governing man. He is merely without the guiding faculty of instinct. Here Graham proceeds to replace man's peculiar guiding power in nature: It is necessary to find a substitute for instinct that will not exclude volition. Enter the innate "moral sense" of the Scottish school--which propels man to desire that which is right, and acts in conjunction with the understanding whose function it is to discriminate between wrong and right. Having described this more complicated factor acting in lieu of the instinct found in animals, Graham promptly puts the "moral sense" back into the material world, subject to physical law: Although the moral sense is not able to discriminate between right and wrong, he explains, yet it

> may be cultivated as to the degree of its energy or influence.--And in this respect, its laws are the same as the common physiological laws of the body.

That is, it can be strengthened by exercise or weakened by want of exercise, or impaired like any organ by "violations of the constitutional law of human nature" (e.g. intemperance in food or drink). Graham is emphatic in his warnings that the "carnal" state of man intimately conditions the mental and moral. (Ibid., I, 357-446.)

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militate against the truth, even as Galileo discovered. Science, in contrast, leads us to the truth and thus provides both an unexcelled ally of hortatory ethics and a sure instrument of control over mind.[32] "The Temperance reformation is a glorious and perfect illustration of this argument," he writes:

> The moral sense of [the] community was but feebly active until the great physiological evils which were developed as consequent on intemperance broke on the astonished people. The pulpit and pious press had ineffectually groaned under the burden of moral appeal, and it was truth, proclaimed by science and advocated by physiologists and physicians, which sent up the banner of victory.... All of piety and righteousness which has resulted from this achievement of the good, has been secured, by working up the conscience and the heart, with appeals founded on the truth which science has unfolded; so that had it been the fate of moral teachers, to have labored alone, the victory would never have been gained, though many long and valorous and noble battles had been fought. ... On the subject of Temperance, it was the work of <u>science</u> to show the public why intoxication was so great and so irresistible a moral evil, by showing it such an injury of the physical part of man, as deprived him of judgment, of reason, and of will. The moral sentiment of approval and disapproval, when such truth, and danger, and iniquity were set before it, became active as the lightning, and as strong as the sea.[33]

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[32] I, 310-312.

[33] <u>Ibid</u>., pp. 312-313.

Evidence of the ease with which the "moral feeling," or Scotch philosophy could be drawn into a naturalistic pattern of thought. The naturalistic aspect of the Scotch philosophy will be considered in some detail in this chapter.

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And it is through completer understanding of mind and body and their relations that he believes man will be able not alone to persuade to virtue, but also to control human behavior.[34] Accordingly this writer hails the work of phrenologists as paving the way to the brave new world:

> There is a sect of philosophers recently organized, and gloriously marshaled, who are out on tours of observation, and not satisfied with merely looking nature in the face, they are upon her very head, with their callipers, craniometers and scalpels, measuring and dissecting as if they would search out the immaterial principle and hold it up in the sun.... And it is stirring to your love of novelty, to see how they labor, while all sorts of moralists and philosophers set up the cry of 'innovation,' 'heresy!' and in the meanwhile, are hugging their dusty volumes of crushed and scattered opinions, to their panting bosoms. The Phrenologists heed none of these things, but intent on reading the book of nature, they burn the midnight lamp of genius over the hand-writing of God, while spirit trembles and blushes as looked upon, for the first time, by mortal eye. Excuse, kind reader, this gush of poetic illustration, in an article dedicated to argument. The success of Phrenologists, is not now to be viewed in the light of fancy, for their labors and the system of philosophy which they teach, have become matters of serious and solid science.[35]

The affinity between a faith in scientific method and a naturalistic bias is indicated by a contributor to the Christian Examiner who undertook to exemplify the true mode of erecting a system of philosophy. "Had metaphysicians,"

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[34] Ibid., p. 313.

[35] Ibid., pp. 313-314.

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he contends,

> been anxious to establish their science on such a foundation, instead of shutting themselves up in their closets, they would have gone forth into the field and the forest, and, in the manners and habits of the inferior tribes, have found moral and intellectual phenomena regulated by the same laws as man's, and received for similar purposes from the same common source of benevolence. They would have found them, too, existing in far simpler conditions; and by thus observing them unconnected with many others which might obscure their peculiar action and character, they would have obtained more definite ideas of their nature and purpose, than when studying them in man, where, existing in their most perfect state, they are necessarily more numerous and complicated. If they had doubted whether a love of acquisition, for instance, be natural to man, or only a forced result of artificial society, they might have seen the squirrel and beaver hoarding up nourishment for a distant period, and learned thereby, that a regard for the future in those who are to abide by its events without the power of foreseeing them, is equally necessary in one being as another. Had metaphysics thus sought the aid of zoölogy and considered it a portion of itself, or at least as an important collateral science, its condition would now have been very different from what it actually is.... Had metaphysicians resorted to the pages of natural history instead of the musty volumes of scholastic warfare, they might have caught some of the spirit that pervades this science, their researches would have been characterized by a more inductive philosophy, and modest doubts and patient investigators have taken the place of dogmatism and speculation. Some of the splendid success with which the natural sciences have been pursued in consequence of following in the path marked out by Bacon, might reasonably have been anticipated for metaphysics, had it been studied in a similar manner.[36]

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[36]"Combe's Constitution of Man," Christian Examiner, XII (1832), 391-392. Possibly by Dr. Joseph Ray, author of textbooks in arithmetic.

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Thus for the scientific naturalist man must be "returned" to nature. "Law for man and law for thing" have to be one--mind and matter, qualitative and quantitative must be resolved[37]--if both are to be included in the scope of scientific method.[38]

ii

Now such naturalistic utterances were not mere fragments of opinion sown thoughtlessly on the wind. In the first place, to urge the equal applicability of scientific method in the investigation of mind and matter was already to be in accord with a principle of wide acceptance--a

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[37] Op. cit., p. 400:

> It will be only when mind is studied in relation with matter, and both in reference to the general laws of the universe, that we shall be no longer vexed with that vague term instinct, which ignorance and indolence have substituted for a rational exposition of the moral powers of the inferior animals.

[38] A student of logic might have recognized immediately that this was starting out with an a priori conviction. Baconians were not, however, notably concerned with the logic of their position. It would perhaps have been to their advantage had they not generally suspected--nay, despised--the 'art of the schoolmen.'

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principle already become part of the schoolboy's catechetical equipment. There was even a conversation-book, one produced by a Presbyterian clergyman of Philadelphia, Ezra Stiles Ely,[39] which required the juvenile philosopher to learn at once that

> in mental science a man must primarily regard his own consciousness of what passes within himself, and look to it for the facts from which he is to reason; just as the natural philosopher looks to the perception of external objects for all the phenomena, whence he is to derive those general observations, which are called the laws of nature.[40]

Furthermore scientific naturalism was inherent in the two systems of philosophy, the empirical and the Scottish, then dominating American thought. And it was also the very sustaining spirit itself of phrenology, which, though properly an evanescent vogue, nevertheless not only contributed to the development of modern psychology but was sufficiently heeded in its day to be judged symptomatic. An examination of all three currents of thought will provide some idea of the suffusion of the naturalistic temper. And first

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[39] Conversations on the Science of the Human Mind, Philadelphia, 1819.

[40] Ibid., p. 14. The Reverend Stiles, in the preface to this work, announces himself a member of the common sense school: "He disclaims all metaphysics but those of common sense." His sources, as listed by himself, include Locke, Hume, Price, Hartley, Kames, Reid, Stewart, Edwards and Beattie (ibid., p. v).

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phrenology, or craniology, as it was also called.

As one leafs through the periodicals issued between 1830 and 1840 he may well be astounded at the widespread and serious interest accorded phrenology.[41] Here, indeed, was a promise of power! Gall or Spurzheim or their Edinburgh disciple, George Combe, had merely to put forth a hand and confidently grasp the reins to human behavior. Large audiences, including even the sober members of the American Institute of Instruction, listened to Spurzheim in Boston and Cambridge.[42] And when in 1832 death cut short his American tour, he was honored with a public burial, a funeral oration by the noted Dr. Charles Follen,[43] an ode by the Reverend John Pierpont,[44] a monument erected by the

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[41]See Appendix III, p. iv.

[42]Charles Follen, "Funeral Oration on Gaspar Spurzheim," in Works, V, 169, 184; Introductory Discourse and the Lectures Delivered Before the American Institute of Instruction, in Boston, August, 1832, "Journal of Proceedings," p. xv.

[43]Works, V, 153-168.

[44]Spurzheim is addressed by Pierpont:

> Nature's priest, how pure and fervent
> Was thy worship at her shrine.

The ode is quoted in its entirety by the Phrenological Journal, VIII (1834), 531.

This was the tribute to Spurzheim of James Stanley Grimes, president of the Western Phrenological Society at Buffalo:

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citizens of Boston,[45] and the preservation of his brain and skull for exhibition by the Boston Phrenological Society.[46]

George Combe, who before visiting America had achieved considerable reputation with his Constitution of Man,[47]

[Footnote 44, contd.]

> no man was ever more sincerely lamented. To the honor of my native city, the most distinguished tokens of love and regard were extended to him while living, and the highest testimonials of grateful reverence followed him to the grave. His beautiful monument at Mount Auburn, is but an emblem of the pure affection with which his memory is cherished. The marble may perish, and the place of his burial be forgotten; but the names both of Gall and Spurzheim are immortal. They must always be associated with principles, that will be known and appreciated, while science has a temple or a devotee on the earth.
>
> A New System of Phrenology (Buffalo and New York, 1839), p. 11.

[45]Thomas Sewall, An Examination of Phrenology; in Two Lectures, Delivered to the Students of the Columbian College, District of Columbia, February, 1837 (Washington City, 1837), pp. 10-11.

[46]Charles Gibbon, Life of George Combe (London, 1878), II, 34.

[47]Vid. n. 78-79. W. E. Channing, in a letter to Combe (1831), bears witness to the popularity of the Constitution of Man:

> The success of your 'Constitution of Man' in our country has been such as must gratify and reward you. It has found general favour. The Swedenborgians (who, in fact, republished it) are particularly interested in it, why, I know not, for I read few of their books. I have heard high commendation of it from a distinguished Calvinist divine, and as to the more liberal

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lectured here with great success from the fall of 1838 to the summer of 1840. He brought his casts and his drawings,[48] delivered his lectures and gave his 'practical lessons' in phrenology to audiences in Boston, New York, Philadelphia, Salem, Lowell, Worcester, Springfield (N.Y.), Albany and New Haven.[49] Rembrandt Peale painted his

[Footnote 47, contd.]

> classes, they have highly approved and recommended it. Some of its doctrines have found the way into the pulpit. I have met on this island [St. Croix, West Indies] a lady from America, of much distinction in the fashionable world, who had brought it with her as a text book, and lent it very freely to the intelligent here. She tells me that a gentleman of Philadelphia bought 50 or 100 copies of it--all he could find--for distribution, believing that he could not do more good. The common remark, however, is that the book is excellent, in spite of its phrenology.
>
> Quoted in Gibbon, op. cit., I, 221.

The presence of phrenology did not prevent its being considered as a textbook for the public schools of Massachusetts. Combe wrote:

> A Committee to prepare school-books was appointed by the State, one minister or leading man out of each nine sects. No book can be adopted unless all agree. Eight have sanctioned my 'Constitution' as it stands, but one orthodox minister dissents, and it stands over; but they expect to remove his objections.
>
> Ibid., II, 30.

[48] Ibid., II, 30.

[49] Ibid., II, 31-33, 47-60, 75, 78-81, 86-87, 94-95.

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portrait.[50] He met and discussed his views with the nation's leading minds--with W. H. Prescott, Daniel Webster, Bancroft, Ticknor, William Ellery Channing and Horace Mann.[51] And he zealously spread the gospel of phrenology, which taught how man might not only eat of the fruit of the tree of knowledge but in so doing gain empire over good and evil.

Some further idea of the interest created in his doctrines may be gathered from the fact that the lectures he delivered at Clinton Hall in New York City were printed by the Whig and the New Yorker,[52] and with due acknowledgment to the latter, by the Southern Literary Messenger,[53] whose editor[54] was "fully persuaded that we cannot offer any thing more acceptable to the readers of the Messenger."[55] Combe

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[50] Ibid., II, 56.

[51] Ibid., II, 33-34, n. 42-43. Combe's Moral Philosophy was dedicated to Dr. Channing (I, 222), and he even prepared a phrenological table of Channing's "development" (II, 45). At a school convention held in Taunton, 1838, Mann read a report which, according to a "much impressed" Combe, "embraced many of the theories of the 'Constitution,' and this was acknowledged" (II, 30-31).

[52] The New Yorker was in the hands of Horace Greeley and Park Benjamin. The first installment appeared April 20, 1839 (pp. 65-67); there were fifteen in all.

[53] Beginning with volume V (June, 1839), 393-397. But note that in November of the same year, the Messenger carried (pp. 742-747) an attack upon phrenology (signed "G.") under the rubric of Sewall's two lectures at Columbian College (vid. bibliog.).

[54] Thomas Willis White.

[55] Editor's Preface, V (1839), 394.

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is introduced to these readers as "the first living Professor of Phrenology,"[56] whose lectures "have attracted, and are still attracting brilliant crowds of admirers in New York."[57] It is the editor's complaint that many people associate this "interesting subject" with "empiricism" and "imposture"; but he is consoled by the thought that public antipathy towards anything new at one time caused the rejection even of the great contributions of Newton and Fulton.

> If in such instances, it has been found hard to beat down human prejudice and error, how much more difficult is it, when the discovery relates to moral, metaphysical or religious truth. A system which teaches that the feelings, propensities and capacities of our nature, may be inferred from cerebral development, or be determined by external and visible conformation, is at once revolting to all those who desire to appear better and wiser than they are--or who are conscious of some secret frailties, or lurking dispositions, which they would gladly conceal from mortal eye.[58]

As for the charge that the system is "allied to materialism," it may be dismissed as a "gross misapprehension," since it "numbers among its disciples some of the firmest believers in the christian [sic] religion."[59]

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[56] Ibid., p. 393.

[57] Loc. cit. The New Yorker, VI (March 2, 1839), 381, informed its readers of the "gratifying reception" accorded Combe's first lectures. In Boston, we are told, his audiences increased from 100 to 500; in New York the average attendance was 400, and in Philadelphia it started with 500 and ended with 1000.

[58] Op. cit., p. 393.

[59] Loc. cit.

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Stronger claims than this were made for its consistency with Christianity. Phrenology actually came in the guise of a new pillar of strength to religion and morality.[60]

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[60]One writer (Ray?) contributed to the Christian Examiner in 1834, the suggestion that the pulpit might well profit by phrenology. "The instructions of the pulpit," he declared,

> ... are not sufficiently practical to be of that essential service in the business of the world, which the truths they convey are designed to impart. The beauty of virtue may be set forth in terms that command admiration and respect, and the inexhaustible happiness which it supplies, be portrayed in the richest coloring that imagination can furnish; yet how often is it, after all, any thing more than a picture that delights the eye while it gazes on it, but excites in the soul few of those glowing emotions which press upon it the conviction of its immortal destinies.... What is wanted from the pulpit is plain, practical knowledge, not of the duties of life, for those are known already, but how they are to be performed, and so made to harmonize, that every thought and act shall conduce to the great end of living.

And what, in this connection, could be of greater help than phrenology, which

> looks for the material instruments whereby the subtler powers of our nature are exercised, defines their respective extent of action, examines the results of their combined operation and reciprocal influence, and furnishes a complete and consistent analysis of the moral and intellectual manifestations.

"Combe's System of Phrenology," XVI (n.s. XI) (1834), 226, 240-241.

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As a consequence it could help more effectively to popularize an essentially naturalistic outlook. As its fundamental axiom it declared, of course, that scientific investigation must be the basis of a true knowledge of man. The great Spurzheim himself had asserted that "the principal artificial impediment to the improvement of psychology was the blamable method pursued" by philosophers of the past "in the study of human nature"; for they explained "all phenomena ... by the imagination alone, or by hypotheses."[61] And there are even today, he complained, philosophers who would divide man from nature:[62]

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[61] Phrenology, or the Doctrine of the Mental Phenomena (1st American edition, Boston, 1832), I, 16.

[62] Spurzheim's definitions of the terms "nature" and "natural laws" clearly indicate that his concept of the universe is positivistic. God too becomes sheer causation--causation merely personified. He conceives of "law" as follows:

> The word law is ... employed to designate the inherent qualities of the objects, and the determinate manner in which the human faculties, and the qualities of organized and inanimate bodies, act. That is to say, beings can only act after their peculiar natures, or according to the qualities and powers with which they are endowed. It is a law, that a stone thrown into the air falls again till it reaches the ground; that the stomach digests; that the eye is the instrument of vision, the ear of hearing, &c. Further, the title law is applied to the regularity with which bodies and animate beings act upon each other, and produce certain phenomena. It is a law, that caloric united with water changes it into a

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> who maintain that man is in no wise subjected to the laws of nature; that he can begin a series of actions independent of all cause and motive, and that his actions admit of no explanation. According to these school-men, man is separated from all other beings, and is considered as regulated by laws peculiar to himself.[63]

But they are in error:

> Man must be studied as a being of creation; and his nature requires the same method of examination as every other natural object--observation and induction.[64]

[Footnote 62, contd.]

> vapor, that fire consumes combustible bodies, that poisons destroy life; and so on, through the whole circle of natural phenomena.
>
> Natural Laws of Man, pp. 2-3.

As for the meaning of the word "nature":

> Nature is a word to which three distinct meanings are attached:-
>
> 1st, It designates the universe,--the heavens, the earth, all that meets sense.
>
> 2nd, It expresses essence [n.b.]--that which characterizes or constitutes a class of beings, or individuality. In this sense we say: every being acts according to its nature;--man in his nature is not an angel; we cannot change the nature of things; we cannot, for example, gather figs of thistles, nor grapes of thorns.
>
> 3rd, It is used to signify the First Cause personified, and may then be considered as synonymous with God, or Creator. Ibid., pp. 3-4.

[63] Phrenology, I, 16.

[64] Loc. cit. Cf. Natural Laws of Man, pp. 37-38:

> In what way can man know, or acquire knowledge?

[Continued on p. 215]

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According to the craniologists it had remained for them to build a system on this only proper foundation. "Until phrenology was discovered," explained Combe, "the nature of man was not scientifically known."[65] And it is only by applying this torch of science that we may hope to dispel the darkness still enveloping the nature of fundamental human experience. "I have the impression," Combe wrote William Ellery Channing in 1830,

> that morals and religion are at present in the same state as that in which the physical sciences existed prior to the practice of the Baconian philosophy. As astrology to astronomy, or alchemy to chemistry, so are the present systems of religion and morals and political economy, as branches of the science of man's nature, to the real science of man, which is

[Footnote 64, contd.]

> Only by observing and inducing; for reflection will no more reveal to man his own nature, than it will give him information of external objects, with their physical qualities and their relations. The study of man by the a priori method, or reflection, has retarded the knowledge of his nature extremely. Every one who entered on the subject assuming himself as the type of the whole species, confounded his own peculiarities with the essential or general constitution of humanity; as if one blind from birth should do well in imagining all mankind similarly circumstanced. Hence arose as many systems of mental philosophy as there were thinkers.

The corollary is, of course, the argument for Baconian cooperative societies to advance learning by pooling the results of observation and experiment.

[65] Constitution of Man, p. 104.

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> in part unfolded, and will in the future be completely developed by phrenology.[66]

To the phrenologist morality was a function of cerebral organs, even as the pumping of blood was a function of the heart. Spurzheim's catechism of "the natural laws of man" defined evil as the infringement of natural law, and went on to explain that "physical and moral evil engender each other mutually."[67] Accordingly, the primary requisite for properly directing human behavior was a knowledge of the natural laws to which the personality (= particular cerebral development) was subject. With the right proportional development of the parts (= 'organs') of the brain corresponding in their influences to the qualities amativeness, combativeness, destructiveness, constructiveness, self-esteem, reverence, hope, etc., etc., one would have a sound character. Now the phrenologist did not drop man utterly and at once helpless into a dungeon of naturalistic fatalism. No, he did offer the possibility of development; he did provide a rôle for self-discipline towards the achievement of desirable characteristics. He held out the hope (and on this partly rested his claim that he was not a materialist!) that, even as a muscle is enlarged by exercise, so may also any 'organ

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[66] Gibbon, I, 217.

[67] Natural Laws of Man, p. 12; also Combe's Constitution of Man, Ch. III.

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of the brain' be enlarged.[68] To practice faithfully reverence, let us say, or philoprogenitiveness, would result in a development of the corresponding cerebral 'organs,' which development would in turn result in an individual more reverential and more philoprogenitive. Thus, true, a rôle was assigned to self-discipline; but it was a spurious rôle, and one suspiciously like a sop to theological scruples about freedom of the will. After all, one must have already possessed a cerebral development which would render possible the exercise of self-discipline. Can there be moral responsibility for the man with an under-developed 'organ of firmness'?[69]

In this scheme of things, then, the problem of good and evil, of morality and immorality, was the problem of learning about the laws of nature by means of scientific method--a problem the same in kind as learning by observation and experiment the effects of certain foods on the body and

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[68]Cf. J. S. Grimes, New System of Phrenology, p. 296:

> My own observations agree with the testimony of all phrenologians, that the proper exercise of any organ tends to increase its size and its power. This is universally admitted to be true of the bodily organs, and it is fair to infer, from analogy, that the same is true of the mental organs. But I am satisfied that exercise and excitement have much more effect upon the brain to increase its size, than upon any of the bodily organs.

[69]Any of the phrenological texts mentioned here will disclose the pattern of thought outlined here, but see especially Combe's Constitution of Man.

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acting in accordance with that knowledge in order to maintain physical health. In man, admittedly a moral as well as an intelligent being (as we read in Combe's Constitution of Man), the

> various faculties have received a definite constitution from the Creator, and stand in determinate relationship to external objects: for example, a healthy palate cannot feel wormwood sweet, nor sugar bitter: a healthy eye cannot see a rod partly plunged in water straight...; a healthy Benevolence cannot feel gratified with murder, nor a healthy Conscientiousness with fraud.[70]

The phrenologist was constantly bringing into juxtaposition, as analogous, experiences in the physical, intellectual and moral spheres. Dualism is negated--evil no longer a self-subsistent reality--in a view which claims

> that the external world, when its constitution and relations shall be sufficiently understood, will be found to be in harmony with all our faculties, and of course that the character of the Deity, as unfolded by the works of creation, will more and more gratify our moral and intellectual powers, in proportion as knowledge advances.

Since

> the structure of the eye is admirably adapted to the laws of light; that of the ear to the laws of sound; that of the muscles to the laws of gravitation; ... it would be strange if our mental constitution was not as wisely adapted to the general order of the external world.[71]

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[70] Ibid., p. 22.

[71] Ibid., p. 207.

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In essence Combe's attitude is that if man had greater knowledge of his own nature (and phrenology affords it), he would be able through practice to regulate his 'faculties'--exercise them properly and in consequence adjust himself to the external world. He would in this way achieve accord with nature and become happy and moral.[72] "In this view," Combe remarks,

> morality becomes a science, and departures from its dictates may be demonstrated as practical follies, injurious to the real interest and happiness of the individual, just as errors in logic are capable of refutation to the understanding.[73]

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[72] Ibid., pp. 72-77.

Thus Spurzheim:

> Wherein consists the happiness of man?
> In the satisfaction of his faculties.
>
> What is the principal cause of the unhappiness of man?
>
> Ignorance and transgression of the natural law.
>
> Natural Laws of Man, pp. 14-15.

And Combe:

> [The design of the Constitution of Man] is to make men happier and better,--to show him the human race may be as happy as the constitution of man actually fits it to be. To do this, the author assumes this constitution was designed to harmonize perfectly with itself in all its parts; and also with the whole creation so far as it is capable of being brought into relations with it.... Human happiness then consists in an exact accordance of all the laws which are in operation within us, and again of these with all the laws which govern the external world. Human misery is the direct and necessary consequence of an infringement of these laws, or of some of them.
>
> Constitution of Man, Pref., pp. viii-ix

[73] Ibid., p. 201.

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To Combe--he had in 1837 been offered the chair of mental and moral philosophy in the University of Michigan[74]--the moral and religious bearing of phrenology was all-significant. His naturalistic temper was so strong, his apprehension of the imaginative and emotional nature of true religious experience so weak, that he saw no incongruity in writing to Channing:

> If you could only get your eyes opened to the indispensable necessity of commencing all substantial improvement of man by studying and teaching his nature practically, and set the example of doing so in your sermons, you would unspeakably benefit your race. Break the spell of teaching only abstract morality and religious feeling from the pulpit, and fairly commence a mental philosophy, as the groundworks, ... and you would sow seeds which time would ripen into a great harvest. While you proceed on the old plan you may delight, instruct, and lead to virtue the few who fall within the sphere of your personal influence, or whose moral organs enable them to comprehend your books, but you will never reach the springs of conduct in the mass of the labouring and money-making population. ... teach first principles, and you will erect standards by means of which men less gifted may discover at least their shortcomings, and consent to be directed by higher views than their own.[75]

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[74]Gibbon, II, 8-9.

[75]Gibbon, I, 220. To which Channing replied from St. Croix (April 11, 1831):

> That our physical nature has been too much overlooked by those who have treated it I fully agree. That its ends and means have been very imperfectly understood is equally true. It is my hope to do something in this field; and I should undoubtedly differ from you in some important particulars. You would place me among

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With the whole of morality and, indeed, the whole of religion summed up in the idea of adjustment, of rapport, between physically instrumented attributes of man and the phenomena of a material external world,[76] phrenology--so its partisans felt--should rightly be acknowledged as an unparalleled asset to Christian theological and ethical tenets. Did it not offer a safeguard against that ignorance

[Footnote 75, contd.]

> the 'abstract' authors, who do not study and teach human nature, 'practically,' and very possibly you would censure me with some reason. I earnestly wish that you would supply the defect by executing your own plan. You doubt your ability; but the conception of it shows that you have no reason for fear.
>
> Quoted Gibbon, I, 220-221.

[76]Cf. Spurzheim, Natural Laws of Man, p. 12:

> What title is given to the consequence of the infringement of a law?
>
> Evil.
>
> Are there many and various kinds of evil?
>
> Evil is first physical, or it is moral; then it is individual, or general; lastly it is temporal, or eternal.
>
> Are not these different kinds of evil linked together and inseparable?
>
> Physical and moral evil engender each other mutually. Individuals and society are connected and in relation; and, according to the christian [sic] religion, our fate through eternity depends on the present life. [Italics mine, in last sentence.]

Cf. also Combe's Moral Philosophy, Philadelphia, 1841.

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of nature's laws, moral and intellectual as well as physical, which is a fundamental cause of evil; that is, of maladjustment? Did it not reinforce the inducement to right belief and right action through its power to demonstrate that Christian principles and the Christian spirit "are founded in the nature of man"--that these have their respective seats in the cranial divisions and thus, having a physical basis, are not merely products of imagination and not, any more than physical laws in other instances, alterable? So expostulated a contributor to the Christian Examiner, defending Combe's System of Phrenology.[77] Nor was it necessary for the craniologist to feel abashed when, in the process of arguing this issue, he was confronted with the question of immortality: "Of the doctrine of future existence," the writer confidently asserted

> the strongest argument that metaphysicians have been able to offer, is the universal desire and longing after immortality in the human breast. Thus stated, the objections to it are too strong to permit of its ever being received as conclusive; for without farther light it might reasonably be doubted, whether the desire in question be any thing more than a modification of that love of life, which is equally shared with us by the brute. If, however, it can be shown, that this desire is one of the functions of a faculty that enters into the moral constitution, then is the doctrine of a future life placed on the same basis with physical truth, and the harmony of

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[77]XVII (1834), 243-245. Again, this may have been Joseph Ray, M.D. Poole's Index gives merely the name Ray.

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> man's nature, as a moral, intellectual, and religious being, is admirably displayed.

And this can be shown by the phrenologist:

> The organ of Hope, as it is represented by Phrenologists, not only inspires the other powers with expectation of success in the attainment of their objects, and pours upon every earthly prospect the beams of a bright and cheering light, but overleaps the narrow confines of the present life, inspiring the soul with an unquenchable thirst for immortality, and filling it with smiling visions of a blissful existence.[78]

Qualitative is thus resolved to quantitative, spirit submerged in matter; and scientific method best represented by phrenology, applicable both to the human constitution and environment, becomes the basis of moral insight and of control over human behavior. In short, phrenology offered a sure, a complete and 'scientific' instrument for regulating human life. The system had a tendency to inspire its devotees with the most sanguine anticipations of such control, at times to the extent of suggesting that they believed the knowledge itself to be equivalent to the Good, or at least to be literally the Power. He who disclosed the operations of natural law within the human psyche was thus in control of the good, the true and the beautiful. God in this scheme was less vital even than Paley's God, who, having constructed the watch and provided it with a

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[78] Ibid., pp. 245-246.

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perpetual movement, was no longer needed. According to phrenology no experience is essential to the good life other than an intellectual grasp of the modus operandi of natural phenomena. The rôle of revealed religion is subordinated by Spurzheim or Combe as much, perhaps, as either dared. The former is willing to declare that revelation is not rendered "superfluous,"

> since all the natural inclinations ... have a continual tendency to err in their application, and revelation, in giving them a good positive direction, may be eminently salutary.[79]

"I do not intend to teach," admitted Combe,

> that the natural laws, discernable [sic] by unassisted reason, are sufficient for the salvation of man without revelation. Human interests regard this world and the next. To enjoy this world, I humbly maintain, that man must discover and obey the natural laws; for example, to ensure health to offspring, the parents must be healthy, and the children after birth must be treated in conformity to the organic laws; to fit them for usefulness in society, they must be instructed in their own constitution,--in that of external objects and beings, and taught to act rationally in reference to these. Revelation does not communicate complete or scientific information

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[79]For Spurzheim, "Natural Religion" is "knowledge of the natural laws ... and unreserved submission to their dictates," and this "man owes and must render to make himself agreeable to the Deity." In Spurzheim's scheme of things, revelation is not rendered "superfluous" because man possesses an innate religious disposition. He is willing to concede that revelation "may be eminently salutary" on occasions when natural inclinations go astray; that is, as an hortatory adjunct of science. Ibid., pp. 134, 139.

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> concerning the best mode of pursuing even our legitimate temporal interests, probably because faculties have been given to man to discover arts, sciences, and the natural laws, and to adapt his conduct to them. The physical, moral, and intellectual nature of man, is itself open to investigation by our natural faculties....[80]

But the balances are already weighted against the supernatural, and Combe's exhortation to Channing[81] does not help matters any. In harmony with this same spirit the numerous phrenological handbooks that appeared during those years were enthusiastically presented to the human race as the most effective allies ever to serve religion, morality, education, temperance or the cause of matrimonial compatibility.[82]

Of course there were those to assail the 'pretensions of phrenology,' but it remains an attestment to the impact of the doctrines originally promulgated by Gall and Spurzheim that they should evoke painstaking refutations such as F. H. Hedge's in the Christian Examiner[83] or Dr. Thomas

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[80] Constitution of Man, pp. 28-29.

[81] Vid. ante, p. 196.

[82] See Appendix III, p. iv.

[83] "Pretensions of Phrenology Examined," in vol. XVII (1834), 249-269. Cf. also Frank H. Hamilton, Lecture on Phrenology, Rochester [N.Y.], 1841. Dr. Hamilton was Professor of the Theory and Practice of Surgery in Geneva Medical College and the Vermont Academy of Medicine.

One genial disparager of 'the march of mind' remarked in the Southern Literary Messenger, that the education of

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Sewall's in lectures before the medical students of Columbian College (D.C.).[84] Hedge, in the face of earnest disavowal by the brotherhood of craniologists, stoutly maintained that their system amounted to physical monism. His "chief object" in writing a refutation, he announces, is

> to expose the presumption with which this doctrine arrogates to itself the supreme right to dictate on subjects beyond the reach of physical inquiry.[85]

"It is," he argues,

> evidently a branch of the Sensual school, and must be considered as belonging to the lowest form of that school. It is in fact a system of pure materialism. We are fully aware that some of its professors have labored to avoid this imputation, but, as it seems to us,

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[Footnote 83, contd.]

children would no longer have to be attended with "incessant toil and intense parental anxiety," now that the world has been given "the renowned science of phrenology."

> A parent in this blessed age of intellectual illuminism, may by an examination of certain craniological protruberances, ascertain with mathematical exactness, whether his child is a hero or a coward, a philosopher or a--fool; and may regulate his education in conformity to the result. The safety and well being of society, too, is thus encompassed with additional safeguards, which will effectually protect it from those evils which have heretofore been only partially suppressed by legislation.
>
> I (1835), 155.

[84] Op. cit.

[85] Christian Examiner, XVII (1834), 268.

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> unsuccessfully and unwisely. Unsuccessfully, because the fundamental principle, and indeed the whole structure, of their doctrine is an everlasting contradiction to any disclaimer which they may see fit to make on this subject;--unwisely, because the disavowal of Materialism gives an appearance of inconsistency to their system, and by this means deprives it of the small degree of consideration it might otherwise claim.[86]

And it is with some passion that he finally disposes of the subject:

> Phrenology is proclaimed, with that boastfulness which always distinguishes sciolism, to be the ultimate and complete science of man,--the last and highest attainment of human wisdom. The beautiful region of mental philosophy is to be converted into a barren Golgotha, or place of skulls. Yes! this ignoble doctrine, born of the dissecting-knife and a lump of medulla, betraying at every step its mean extraction--th[i]s carnal philosophy, with its limited conceptions, its grey truisms, its purblind theories, its withering conclusions, and its weary dogmatism, is to supplant the lofty faith of antiquity, and the sublime philosophy of the Bible, and to sit in judgment on the infinite and eternal![87]

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As already noted, naturalism was not limited to a "doctrine born of the dissecting-knife and a lump of

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[86] Christian Examiner, XVII (1834), 252.

[87] Ibid., p. 254.

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medulla." Also in the stream of naturalistic thought was the Scottish philosophy--the intuitionism that in the first half of the nineteenth century successfully opposed classic empiricism as America's academic philosophy.[88] The Scottish school was none the less naturalistic in bias for its having rejected the Lockean psychology. Of course, the psychological experience of association was recognized and given consideration by the former;[89] but Stewart, for instance, explicitly maintains that the use of association of ideas to explain moral judgments must reach a limit beyond which we have "the simple and original laws of our constitution."[90] This, indeed, is postulating a realm of absolutes, is providing a safeguard against a morality that is capricious or

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[88]Rudolf Metz, A Hundred Years of British Philosophy (London and New York, 1938), pp. 47-49.

Dr. Metz notes that between the "classical empiricism" of the seventeenth and eighteenth centuries, ending with Hume, and the triumph of "modern empiricism" with J. S. Mill in the second half of the nineteenth century, the Scottish philosophy successfully withstood the empirical current. The fact that the Scottish philosophy, with its intuitionism, was in conflict with empiricism, and that it was in the ascendant from the time of Reid's attack upon Hume to that of J. S. Mill's attack upon Sir William Hamilton, does not affect the interpretation contained in the following pages; for it will be shown, adequately I trust, that both patterns of thought were naturalistic and involved all the fundamental Baconian implications.

[89]Cf. Dugald Stewart, Elements of the Philosophy of the Human Mind, I, ch. v.

[90]Ibid., I, 190.

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merely 'historical.' But it did not mean, consequently, that the source of moral judgments was supernatural, or spiritual. Moreover, the purpose cheerfully assumed by the Scotch philosophers was to justify the Baconian faith of the common man: in despite of Hume to give prestige in philosophical sanction to homely common sense--to faith in the obvious, the practical and the profitable.[91] They presented common sense as the "natural light" which equally makes man capable of distinguishing truth from error and "capable of acting with common prudence in life."[92] They trusted in God--and also the Novum Organum.[93] "For I am

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[91]Stewart, op. cit., I, 24-26; II, 21-52, also ch. iv; Reid, Inquiry into the Human Mind, I, i; Adam Smith, "The Principles which Lead and Direct Philosophical Enquiries; Illustrated by the History of Astronomy," in Works, with an Account of His Life and Writings by Dugald Stewart (London, 1812), V, 65-80.

Dr. Metz (op. cit., p. 29) has this to say of the Scottish philosophy:

> In its systematic import it is far inferior to the great classic works of British philosophy, with which it is directly connected and apart from which it is unintelligible; in its regress to healthy human understanding it implies a relaxation of the philosophic impulse and a decline of that speculative force from which Hume's mighty shock to thought issued.

[92]Thomas Reid, quoted with approval by Stewart, op. cit., II, 50-51.

[93]Reid, op. cit., VI.xxiv.

> The rules of inductive reasoning, or if a just interpretation of Nature, as well as

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persuaded," Reid announced, "that absolute scepticism is not more destructive of the faith of a Christian than of the science of a philosopher, and of the prudence of a man of common understanding."[94] Accordingly the common sense philosophers believed that knowledge was power and that a faithful application of scientific method would bear fruit in a true science of man and society. They set mind and heart within natural law and made them the legitimate objects of empirical investigation. That they did not consider the "original constitution of man"--reason and the "moral feelings"--susceptible alone to hortatory appeal and discipline according to revealed or mystically intuited truth, beauty and goodness, is borne out by the expressed belief of both Reid and Stewart that scientific method will provide the data upon which to base an understanding, and hence proper control, of human behavior. Know the facts and you will have it within your power, by adjusting environmental factors in the light of those facts, to control intellectual and moral development. It is not a matter of

[Footnote 93, contd.]

> the fallacies by which we are apt to misinterpret her language, have been, with wonderful sagacity, delineated by the great genius of Lord Bacon: so that his 'Novum Organum' may justly be called 'A Grammar of the Language of Nature.'

[94] Ibid., Dedication, p. 95.

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poetic inspiration but of prosaic investigation.

Thomas Reid saw justification for this Baconian faith in the progress of anatomical science. "All that we know of the body," he maintained,

> is owing to anatomical dissection and observation, and it must be by an anatomy of the mind that we can discover its powers and principles.[95]

The latter is merely "more difficult," not different in kind.[96] The mind of man--its needs, proclivities, discipline--is not, as the humanist would contend, properly the subject of intuitive insight. With the Scottish philosophers the intuitive enters only at the subrational root of human tendence, where its function is to make us feel certain that the scientific method is valid and the data induced thereby true.[97] It is only upon such data that Reid would depend for an understanding and hence control of mind. He is impatient that the laws of mind are not thus, like the laws of mechanics, astronomy and optics, settled and proven universally to obtain; for he is sure that

> could we obtain a distinct and full history of all that hath part in the mind of a child, from the beginning of life and sensation, till it

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[95] Ibid., I.i.

[96] Loc. cit.

[97] Stewart, op. cit., I, ch. iv, sec. 5.

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> grows up to the use of reason--how its infant faculties began to work, and how they brought forth and ripened all the various notions, opinions, and sentiments which we find in ourselves when we come to be capable of reflection--this would be a treasure of natural history, which would probably give more light into the human faculties, than all the systems of philosophers about them since the beginning of the world.[98]

And Reid's pupil, Dugald Stewart, likewise saw in the application of the 'true philosophy' superseding the 'false

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[98] Op. cit., I.ii.

Note that in this connection Reid explicitly rejects, censures the use of, creative imagination:

> It is genius, and not the want of it, that adulterates philosophy, and fills it with error and false theory. A creative imagination disdains the mean offices of digging for a foundation, of removing rubbish, and carrying materials; leaving these servile employments to the drudges in science, it plans a design, and raises a fabric. Invention supplies materials where they are wanting, and fancy adds colouring and every befitting ornament. The work pleases the eye, and wants nothing but solidity and a good foundation. It seems even to vie with the works of nature, till some succeeding architect blows it into rubbish, and builds as goodly a fabric of his own in its place. Happily for the present age, the castle-builders employ themselves more in romance than in philosophy. That is undoubtedly their province, and in those regions the offspring of fancy is legitimate, but in philosophy it is all spurious.
>
> Loc. cit.

Produce the "facts," this "hard temperamentalist" urges; the province of the imagination is lower than that of "common sense."

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systems of the past' a promise of unprecedented knowledge of man.[99] Aristotle is, accordingly, derogated as having produced nothing but a "parade of words," demonstrations reducible to "puerility"--in all, a logic based on the false assumption that truth is attainable by reasoning apart from demonstration.[100] He upholds Bacon on the "inutility of the syllogism" and the indispensability of the inductive method in studying nature:

> It is an observation which has been repeated since Bacon's time, and which, it is astonishing, was so long in forcing itself on the notice of philosophers, that, in all our reasonings about the established order of the universe, experience is our sole guide, and knowledge is to be acquired only by ascending from particulars to generals; whereas the syllogism leads us invariably from universals to particulars, the truth of which, instead of being a consequence of the universal proposition, is implied and presupposed in the very terms of its enunciation. The syllogistic art, therefore, can be of no use in extending our knowledge of nature.[101]

It is, then, upon scientific method that Stewart builds his hope for that knowledge and power which is to bring into being the brave new world. Like Reid, he puts the study of mental activity on the same basis as the study of matter: ideas both from sensible objects and from mental activity

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[99] Op. cit., I, 9.

[100] Ibid., II, ch. iii.

[101] Ibid., II, 141-142.

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being, he contends, equally subject to investigation inductively, and by means of the senses.[102] There seems no reason to doubt the efficacy in connection with man and society of that method of inquiry which has meant such advance in knowledge of the physical world. "Of the progress which may yet be made in the different branches of moral and political philosophy," he argues,

> we may form some idea, from what already has happened in physics, since the time that Lord Bacon united in one useful direction, the labours of those who cultivate that science.--At the period when he wrote, physics was certainly in a more hopeless state, than that of moral and political philosophy in the present age. A perpetual succession of chimerical theories had, till then, amused the world; and the prevailing opinion was that the case would continue to be the same for ever. Why then should we despair of the competency of the human faculties to establish solid and permanent systems, upon other subjects, which are of still more serious importance? Physics, it is true, are [sic] free from many difficulties which obstruct our progress in moral and political enquiries; but, perhaps, this advantage may be more than counterbalanced by the tendency they have to engage a more Universal, and a more earnest attention, in consequence of their coming home more immediately to our 'business and our bosoms.' When those sciences too begin to be prosecuted on a regular and systematical plan, their improvement will go on with an accelerated velocity; not only as the number of speculative minds will be every day increased by the diffusion of knowledge, but as an acquaintance with the just rules of inquiry will more and more place important discoveries within the reach of ordinary understandings.

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[102] Op. cit., I, 11-12.

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Do we not have the assurance of Bacon on this point?

> 'Such rules,' (says Lord Bacon) 'do, in some sort, equal men's wits, and leave no great advantage or pre-eminence to the perfect and excellent motions of the spirit. To draw a straight line, or to describe a circle, by aim of hand only, there must be a great difference between an unsteady and an unpractised hand and a steady and practised; but, to do it by a rule or compass, it is much alike.'[103]

Which assurance manifests the educationally formative egalitarian tendency of the Baconian theory of knowledge. It points to the hope of a brave new world wherein facts systematically unearthed by trained persons, the technicians, would supersede the 'wisdom of the ages revealed to the race by a few superior spirits in religion, philosophy, art and literature.' Thus baldly proposed, the hope would most probably have met with a Scottish philosopher's rejection; but there is the inescapable inference of Stewart's opinion that Bacon's views on "the nature, the object, and the limits of philosophical investigation" partake "of the nature of prophecy."[104] And there is more than inference

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[103] Op. cit., I, 134.

[104] Ibid., II, 164.

Add to this the opinion, in harmony with Reid's view (n. 98), that the world is to be advanced by the Baconian investigators, not by "original genius":

> It is upon these last considerations, much more than on the efforts of original genius, that I would rest my hopes of the progress of the

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in Stewart's identification of knowledge and its goal for both 'true philosopher' and common man engaged in the ordinary business of life: in his belief that

> the knowledge of the philosopher differs from that information which is the fruit of common experience, not in kind, but in degree;[105]

and further, that

> the ultimate object which the philosopher aims at in his researches is precisely the same with that which every man of plain understanding, however uneducated, has in view, when he remarks the events which fall under his observation, in order to obtain rules for the future regulation of his conduct.[106]

[Footnote 104, contd.]

> human race. What genius alone could accomplish in science, the world has already seen: and I am ready to subscribe to the opinion of those who think, that the splendour of its past exertions is not likely to be obscured by the fame of future philosophers. But the experiment yet remains to be tried, what lights may be thrown on the most important of all subjects, by the free discussion of inquisitive nations, unfettered by prejudice, and stimulated in their inquiries by every motive that can awaken whatever is either generous or selfish in human nature. How trifling are the effects which the bodily strength of an individual is able to produce, (however great may be his natural endowments) when compared with those which have been accomplished by the conspiring force of an ordinary multitude?
>
> Ibid., I, 134-135.

[105] Ibid., II, 168.

[106] Ibid., II, 167-168.

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"The more knowledge of this kind we acquire," he contended,

> the better can we accommodate our conduct to the established order of things; and the more are we enabled to avail ourselves of natural agents as instruments for accomplishing our purposes. It is with truth, therefore, that Bacon so often repeats, that 'every accession which Man gains to his knowledge, is also an accession to his power; and extends the limits of his empire over the world which he inhabits.'[107]

The extension of this empire in the domain of mind is the particular concern of Stewart and others of the Scottish school. He regrets the want "in any language" of an effort

> to analyze and illustrate the principles of human nature, in order to lay a philosophical foundation for their proper culture.[108]

Were such a foundation available, we could educate properly: bring the faculties to greater perfection, secure the mind against error; for we should have the knowledge that gives the power to direct the machinery of thought and impulse--to place people under such influences as are conducive to good.[109] Of the influences to which man is subject, Stewart is willing, of course, to apportion some to the realm of the inscrutable, or at least, of the suprasensorial.[110] But when he objected to Bacon's exclusion of "final causes" from

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[107] Op. cit., II, 168.

[108] Ibid., I, 21.

[109] Ibid., I, 18-22.

[110] Ibid., I, 182-190.

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the province of the "new philosophy," it was only to proceed to blur the distinction between teleological and functional. In fact, 'to avoid confusion' he would substitute the terms "ends" and "uses" for "final causes"; the moral "ends" of human life and the "ends" of the pancreas thus equally and by the same means become investigable.[111] It would follow

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[111] Op. cit., I, ch. iv, sec. 6. In the very introduction to his Philosophy of the Human Mind (I, 11-14), Stewart clarifies his position with respect to "essence" and ultimate purpose. There we are told (p. 14) that "the case is exactly the same in the philosophy of mind" as in the philosophy of matter: we are dealing with observable phenomena; the 'unknowable' may be, for all practical and hence important purposes, disregarded. "I cannot help taking this opportunity of remarking," he writes (I, 12),

> ... that if physical inquirers should think of again employing themselves in speculations about the nature of matter, instead of attempting to ascertain its sensible properties and laws, (and of late there seems to be such a tendency among some of the followers of Boscovich,) they will soon involve themselves in an inextricable labyrinth, and the first principles of physics will be rendered as mysterious and chimerical, as the pneumatology of the schoolmen.

And, again (I, 13):

> In the investigation of physical laws, it is well known, that our inquiries must always terminate in some general fact, of which no account can be given, but that such is the constitution of nature. After we have established, for example, from the astronomical phenomena, the universality of the law of gravitation, it may still be asked, whether this law implies the constant agency of mind; and (upon the supposition that it does) whether it be probable that the Deity always operates immediately, or by means of subordinate instruments! But these questions, however curious, do not fall under the province of the natural philosopher. It is sufficient for his purpose, if the universality of the fact be admitted.

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that neither revelation nor imaginative insight have any rôle to play in the ascertaining of right. Morality and truth are health and happiness, and these the proper conditioning, in the light of scientific knowledge, of a palpable organism. Both mystic and humanist are plunged into an alien world.[112]

During the first part of the nineteenth century the impact of the Scottish philosophy in American thought was apparently heavy.[113] The works of Reid, Stewart and Brown

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[112]Which is the brave new world wherein man is apparently neither weak nor humble: "I have only to observe farther," announced Stewart,

> that, in proportion as these prospects, with respect to the progress of reason, the diffusion of knowledge, and the consequent improvement of mankind shall be realized, the political history of the world will be regulated by steady and uniform causes, and the philosopher will be enabled to form probable conjectures with respect to the future course of human affairs.
>
> Op. cit., I, 136.

[113]There is the opinion of James McCosh that from the time of Witherspoon "the Scottish became the most influential philosophy in America." The Scottish Philosophy, Biographical, Expository, Critical, from Hutcheson to Hamilton (London, 1875), p. 188. Jefferson, writing to John Adams in 1820, observed:

> Stewart is a great man, and among the most honest living.... I consider him and Tracy as the ablest metaphysicians living; by which I mean investigators of the thinking faculty of man. Stewart seems to have given its natural history from facts and observations....
>
> Writings, XV, 239-240.

[Continued on p. 240]

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were issuing in abundance from the American press.[114] By 1823, thirty years after its first appearance, there were "eight editions, comprising 7500 copies of Stewart's Philosophy published here"--to give C. J. Ingersoll additional evidence of the nation's intellectual vitality.[115] Stewart, together with Reid and Brown, provided the college texts

[Footnote 113, contd.]

In 1816 Jefferson had written to Adams:

> I believe [contrary to Hobbes] ... that [justice] is instinct and innate, that the moral sense is as much a part of our constitution as that of feeling, seeing, or hearing.
>
> Ibid., p. 76.

At the same time that he wrote Adams of his trust in the conclusions of Stewart, he remarked:

> When I meet with a proposition beyond finite comprehension, I abandon it as I do a weight which human strength cannot lift, and I think ignorance, in these cases, is truly the softest pillow on which I can lay my head.
>
> Ibid., p. 241.

[114] I. W. Riley, American Philosophy. The Early Schools (New York, 1907), p. 18.

[115] Discourse Concerning Influence of America on the Mind, p. 18.

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in general use for courses in mental and moral philosophy.[116] And "the Protestant clergy of the times," so Woodbridge Riley tells us, "were practically all formed from the Scotch pattern."[117] In fact, hugely successful in this country through standing foursquare on practicality and religion, the Scottish philosophy came to be labeled "the American philosophy."[118] Certainly, even earlier than this, a Presbyterian

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[116] I. W. Riley, op. cit., p. 516; C. F. Thwing, History of Higher Education in America (New York, 1906), pp. 300-301. A representative textbook in moral philosophy for the period was Valpy's condensed version of William Paley's Moral and Political Philosophy. Ostensibly offering Paley's views, an edition of this work annotated by one Richard W. Green and published in 1835 at Philadelphia, submerged the original author's opinions under Scottish philosophy represented by quotations from Reid, Stewart and Brown! Alexander H. Everett provided readers of the North American (which he was editing at the time) with critical analyses of the Scotch philosophy: "Stewart's Moral Philosophy," XXXI (1830), 213-267; "Sir James Mackintosh," XXXV (1832), 433-472. These were reprinted in Everett's Critical and Miscellaneous Essays, to which Are Added a Few Poems [First Series] (Boston, 1845), pp. 283-337; Critical and Miscellaneous Essays, Second Series (Boston, 1846), pp. 253-300.

[117] American Thought from Puritanism to Pragmatism and Beyond (New York, reprinted 1941), pp. 120-121. It should be borne in mind that during this period there was close association between Scotch and American minds, particularly in science and medicine.

[118] Riley, American Philosophy, p. 18; American Thought, p. 119:

> For this astonishing success several reasons have been given: not only was the common sense philosophy of Reid, Stewart, Brown, and Hamilton in harmony with the practical note of the country, but it was also an aid to faith, a safeguard to morality as against the skepticism of Hume and the atheism of the Voltairians.
>
> Ibid., p. 119.

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dominie was not constrained out of deference for the doctrine of depravity to reject the idea of innate "moral feelings." Indeed it was a Presbyterian minister, the Scotch-born John Witherspoon, called to head the College of New Jersey (now Princeton) in 1768, who is credited with fostering the common sense philosophy in the United States.[119] To make "moral feelings" consistent with a drastically weakened concept of "depravity" the Reverend Witherspoon had only to picture evil as "departure" from the "original purity" of "natural conscience."[120]

iv

Although in opposition, the Scottish philosophy and what has been called the classic element in modern philosophy--the empiricism, sensationalism and associationism of Locke, Hartley, Bentham and those who came after them--were together tributary to the stream of naturalism in the United States. And the latter in fuller volume, since it was the more deeply and extensively merged in the nation's

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[119] Dictionary of American Biography, XX, 437; J. McCosh, op. cit., pp. 184, 187-188.

[120] Lectures on Moral Philosophy (Philadelphia, 1822), pp. 6-9.

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intellectual current,[121] besides being more easily integrated with materialism. If the Lockean psychology did not

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[121]Academic philosophy in America was almost entirely a confluent of both Scottish philosophy and empiricism. Locke's Human Understanding was as standard a school text as any of the works of Reid or Stewart. Cf. Harvey G. Townsend, Philosophical Ideas in the United States (New York, 1934), pp. 96-97.

American thought was so patently dependent upon British that it would be gratuitous for me to defend my application to the former, as well, of what Dr. Metz says of the latter in his account of the British "utilitarian-empirical school" (op. cit., p. 47):

> The main line of British philosophy runs in a relatively continuous and self-contained course from the Renaissance to the present day. This line of thought is usually called empiricism or the philosophy of experience. More than any other it can look back upon a long tradition and in no other country has it been embodied so typically and strikingly as in the British Isles. We may therefore call it the indigenous or national or traditional school, and although it would be a crude misinterpretation of the facts to identify it simply with British thinking, yet there is a certain justification for holding that this is the most typically British school. In any case we have here not a school which has been invented by historians of philosophy, but the real existence of a single basic idea and attitude of thought, which in spite of great diversity, in spite of side-issues and by-paths, offers to our view what is essentially a unitary whole. The philosophic line which stretches from Bacon and Hobbes to Locke, Berkeley, and Hume, and thence to Bentham, Mill, and Spencer, implies a complex of coherent and harmonious principles which take on a different appearance according to the standpoint from which they are viewed, but always stand in relation to the same totality. If we wish to find suitable terms for this totality in its main aspects, we must choose empiricism or positivism to show its general philosophic position, sensationalism or phenomenalism in relation to its theory

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present human personality as the product of cerebral configuration, it did make it essentially the product of external and physical environment. For sensationalism entails the position that, if "the power of conduct" depends on getting the right associations (e.g. a pleasurable sensation with an assigned duty)--if character is determinable by an external conjunction of phenomena psycho-physiologically operative--then the moral man becomes no more than a product of the right physical environment and the immoral man a product of the wrong. A villain, in short, is only the passive victim of wrong associations that cause him to act on the wrong impulses. (Both sentimental and scientific naturalism find themselves en rapport here.) Accordingly the moralist wishing to be effective would be obliged to shut his time-worn tomes and commence examining, measuring, collecting data on such influences as climate, geography, living space per individual, presence or absence of competitive

[Footnote 121, contd.]

> of knowledge, associationism in relation to its psychology, hedonism, eudaemonism, or utilitarianism in relation to its ethics, . . . scepticism or agnosticism in relation to its metaphysics, deism or indifferentism (occasionally also atheism) in relation to religion, liberalism in relation to politics.

Cf. also Morris Cohen, "Philosophy in the American College," in Cyclopedia of Education, IV, 689.

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drives and schoolmasters' ferules. A scientific investigation of environment in its connection with mind (social psychology, criminology, etc., etc.) becomes the prerequisite for improving the human race. The good, the true, and the beautiful become historically explicable and subject to scientific controls. The naturalistic concomitant of such an attitude is a concept of ideal 'natural' development under 'natural' conditions; that is, a development by means of associations in experience that were agreeable to the 'original constitution' of man.[122] Nature meant for all the impulses and faculties to serve their purpose; all had their proper function and all needed to be expressed for a happy life. But men have been subjected to 'unnatural' environments that derange the 'natural' propensities, disturb the 'natural' balance of personality. Hence the world's misery and evil. The only corrective is to learn and apply the truth that for sound men--even superior men--environment should be in harmony with 'natural' propensities: should permit their full, normal development and expression.

And this ideal 'natural' development would be within man's power when enough facts had been gathered through scientific study--by historical (the 'case history' idea) and

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[122]The Scottish philosophers also, be it remembered, endeavored to supply an 'original constitution' of man, and the phrenologists likewise.

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experimental investigations into human ecology--to provide an adequate understanding of the natural laws governing human behavior. Such a science of man, based thus on dependable data, would be the instrument for producing ideal humans whose every impulse would be in harmony with the cosmic order, and who would accordingly be able to live completely 'normal,' because completely 'natural,' lives--that being the sum and substance of morality and the good life. Humanity would know at last how to establish the kind of social environment which would not warp the originally good potential of human children: environmental influences would be so effectively controlled as to bring fulfillment, not frustration. Behavior in accord with natural laws being at the disposal of man, ethical action could be as readily promoted as health of body, and by the same means. Evil at long last would vanish from the earth.[123]

So Robert Owen, with a vision of the future world populated by superior men, the passive products of an environment created through a knowledge of the 'facts' of human nature.[124]

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[123]See Appendix IV, p. vii.

[124]The Book of the New Moral World, Containing the Rational System of Society, Founded on Demonstrable Facts, Developing the Constitution and Laws of Human Nature and of Society (London, 1836), p. 97:

> For, these facts and laws which demonstrate what human nature is, develop, also, a sufficiency of

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It was a basic and "self-evident" principle with Owen that no man has power over his own character. "Any general character," he contended,

> from the best to the worst, from the most ignorant to the most enlightened, may be given to any community, even to the world at large, by the application of proper means; which means are to a great extent at the command and under the control of those who have influence in the affairs of men.[125]

Having postulated that man is a creature of circumstances, Owen was obliged to provide him with motivation subject to those circumstances and integrated with natural law: hence the merging of empiricism and eudaemonism:

> Each individual is so organized, that he must like that which is pleasant to him, or which, in other words, produces agreeable sensations in him; and dislike that which is unpleasant to him, or which, in other words, produces in him disagreeable sensations; and

[Footnote 124, contd.]

> power to accomplish results far more extraordinary than any miracles which the wild fancy of superstition has yet imagined.

And, again (p. 82):

> Before a truly superior character can be formed among men, a new arrangement of external circumstances must be combined, all of which must be in unison with human nature, and calculated to produce rational impressions only upon the human organization.

Owen's activities, even as Locke's thought, are a part of American as well as British cultural history.

[125] A New View of Society and Other Writings (London, 1927), First Essay, p. 16.

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> he cannot know, previously to experience, what particular sensations new objects will produce on any one of his senses.[126]

And herein is the basis of virtue and vice: if man seeks those things that make for his happiness he is acting in accord with the natural laws governing his constitution; that is, virtuously.

> Man ... to be permanently virtuous and happy, from birth to death, must implicitly obey this law of his, and of universal nature.[127]

It is therefore necessary, if the proper circumstances are to be arranged for man and the millennium envisioned by Owen ever to be attained, that the facts of human nature be learned--that the laws of his nature be investigated. Such knowledge alone should be the basis of social organization.[128] It is "experience," according to Owen, that

> will ... teach us how to form character, individually and generally, so as to give the greatest sum of happiness to the individual and to mankind.[129]

He has faith that environment can be controlled to this end "with mathematical precision";[130] for to Owen the laws

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[126] Book of the New Moral World, Sec. XII, 54-55.

[127] Ibid., Sec. XII, 58; cf. pp. 56-57.

[128] It is being in accord with natural law--entertaining "true ideas" (i.e. based on facts)--that Owen means by being "rational." Book of New Moral World, Sec. IX.

[129] New View, First Essay, p. 19.

[130] Ibid., p. 20.

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governing man are no different from the laws governing other natural phenomena--equally and in the same manner investigable. Law for man and law for thing are one; man is no higher than nature:

> The worm and the insect are his kinsfolk; they are from the same original stock of materials, and in the next decomposition will unite again as children of the same origin, proceeding from one common parent, who is alike interested in the general happiness of every being formed from the universal mass from whence all come, and into which all return.

"No! man is not," he insists,

> an exception to the general laws of nature; he is born and he dies, and 'the place which knew him, knows him no more.'[131]

And when man has learned to live in agreement with those laws of nature, he will do away with the "false notions" that "have ever produced evil and misery in the world";[132] he will be enabled to produce a race of men such as "has not yet been known among mankind"--a race of "rational and

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[131] Debate on the Evidences of Christianity ... Held in the City of Cincinnati, Ohio, in April, 1829 (Cincinnati, 1829), p. 156.

Note also that Owen expressed the hope that a knowledge of eugenics based on experience with animals and vegetables may be with profit applied in breeding superior physical, intellectual and moral human specimens. Ibid., pp. 135-136.

[132] New View, Third Essay, p. 56.

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superior character."[133] He will have the power to organize a society in which there will be that balance of self-interest and social interest wherein true harmony with nature, hence happiness, consists.[134]

This was the faith so optimistically promulgated by Owen. "Our present views, my friends," he announced in his great Cincinnati debate,

> are very cheering; we have the prospect of breaking the shell of ignorance and darkness, which has long imprisoned our faculties--we are now like the chicken picking at the shell, in order to set itself at liberty and see the light. This will be a glorious era.[135]

I do not mean to imply by this relatively extensive treatment of Owen's ideas that Americans generally, or to any wide extent, accepted and acted upon them. Actually his views aroused vehement opposition.[136] But he has been given

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[133] Book of New Moral World, Sec. XX, 81-84; also Debate, p. 242.

[134] New View, Third Essay, pp. 56-57.

[135] Debate, p. 242.

[136] Cf. [W. L. Fisher], An Examination of the New System of Society by Robert Owen, Showing Its Insufficiency to Reform Mankind, Philadelphia, 1826; James K. Paulding, Merry Tales of the Three Wise Men of Gotham, New York, 1826; and the Debate from which we have already quoted. If we may generalize from a few pieces of evidence, it would seem that Owen's determined condemnation of every religious institution ever conceived by man was the particular cause of antipathy. This is indicated by the Debate on the Evidences of Christianity and of Owen's account of the events leading up to the debate (ibid., pp. 11-12). It was principally Owen's treatment of religion to which Griscom, for instance, objected. Griscom's

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this much attention because he so unequivocally and forthrightly expressed the viewpoint which, even if not to any

[Footnote 136, contd.]

axiom is that any movement to improve men, not based on "religious faith and the sanctions of futurity" is bound to fail:

> That every attempt to produce a material change in the exterior relations of mankind, upon a system which even admits that the bonds of religious union are useless and unnecessary, must inevitably fail, is my firm persuasion; and no person, I think, can spend a day at this village (New Lanark), as I have done, in company with its intelligent director, without regretting that so much practical talent and such unaffected benevolence, should be found united with the cold speculations of a stubborn scepticism, which finds no motives for the cultivation of its highest powers of mind and heart, but such as are limited to this momentary stage of existence.
>
> Year in Europe, II, 392-393.

Griscom was, of course, a representative American Baconian; that is, churchly as well as practical, and tending to merge both attributes. As we have already indicated, a pious temper was not necessarily inimical to a naturalistic tendency of thought.

We have further evidence that anxiety for 'religion' motivated opposition to Owen here, in the refusal of the Indiana State Legislature to grant a charter to the New Harmony Education Society, because of the impression that "atheism was promulgated in the New Harmony schools." Will S. Monroe, History of the Pestalozzian Movement in the United States (Syracuse, 1907), pp. 52-53. Mrs. Emma Willard lashed out against Robert Owen, as well as against Mary Wolstoncraft [sic] and Frances Wright, because they

> madly seek to break the social order, and dissolve that golden link which God himself has instituted, and in which woman, in obedience to her nature, and the express commands of God, acknowledges man as her head.
>
> Advancement of Female Education: or, a Series of Addresses, in Favor of Establishing at Athens, in Greece, a Female Seminary, Especially Designed to Instruct Female Teachers (Troy, 1833), p. 10.

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demonstrable degree directly through his own efforts in America, was nevertheless influencing the thought of the entire nation. With the ideas of phrenologists and New Harmonists in the air, and with respectable schools of philosophy dissolving man in nature, perhaps it should not be surprising to find the Reverend Follen having some difficulty balancing 'free will' with the belief that

> the works of Gall and Spurzheim will convince all of the great importance of the study of nature, and particularly of physiology, in order to arrive at sound views of morality.[137]

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[137] Works, V, 170-172. The view is expressed in Follen's funeral oration for Spurzheim. After delivering this opinion, Follen asserts:

> Though the works of Spurzheim abound in noble and salutary views and precepts, yet the great subject which lies at the foundation of moral philosophy, the moral free-agency and responsibility of man, cannot be determined by the physiology of the brain, however true to nature.
>
> Ibid., p. 172.

Nevertheless Follen asks for open-mindedness in considering the claims of phrenology. Moreover, he reveals elsewhere a tendency to naturalize the spirit. At one time he calls himself a "psychologist" and prepares "to examine [the] various facts of consciousness, with a view to reduce them to their spiritual elements." Works, III, 353. He accepts the doctrine of the "moral sense" and makes this "faculty" a 'natural power' (ibid., pp. 148-149, 207); he sees the highest duty of the individual as expansion of self according to natural law or impulse (ibid., pp. 207-212). Even the "future state of man" is described by Follen as one in which man's mundane faculties and propensities ('natural') are retained in essence, but refined and rendered more potent (Works, V, 17-50).

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The pervasiveness of scientific naturalism becomes more evident when we find that even the Reverend Mark Hopkins, with his strong sense of duality in the nature of man, could not escape its influence. Thus, despite his belief in the free agency of man and his insistence on self-discipline for morality, he endeavored to put the Bible and morality on the same basis, subject to the same investigative procedure, as any of the sciences. "The great systems of physical and moral truth," he asserted,

> are not unconnected; and were it only for the purposes of illustration, it would behoove the preacher to be familiar with the fields of science. They have indeed been studied as separate, just as the arterial and venous systems in the human body were once studied as separate; but it will yet be seen that it is in the moral portion of this universe that the pulse of its life throbs, and that it is from its connection with this that the rest derives its vitality and importance.

The sciences--moral and physical--"are all of one family," he contends, "and ... the advancement of one has an immediate effect upon that of others." For the "immense intellectual and moral universe" corresponds "in extent and variety to the physical universe," and "these are linked together by numberless relations so as to form but one whole." It would follow, then, that morality may be achieved by understanding and applying the natural laws both of the moral and physical levels of being. Science

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and the Gospel both command temperance![138]

Others were apparently troubled less than such divines as Follen and Hopkins by loyalty to an inherited doctrine of duality. Thus the American Health Convention assembled

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[138]"Address, Delivered before the Porter Rhetorical Society of the Theological Seminary, Andover, September 5, 1837," in Miscellaneous Essays and Discourses, pp. 156-165. On another occasion Hopkins even quotes from Combe regarding the connection of the well-being of man with obedience to natural laws (Miscellaneous Essays, pp. 72-75). Hopkins adds, as his own opinion:

> The more the physical and organic laws are scrutinized, the more they will be found for the benefit of man, when their requisitions are complied with. And as man has faculties by which he can discover and obey them, evils which take place under them, evils which comprise a vast deal of suffering in this world, are to be imputed to his own fault, to his ignorance and folly, and not to an inscrutable Providence.
>
> Ibid., p. 77.

But at this point Hopkins differentiates between moral and physical law--gets his theological bearings and returns to dualism:

> [The moral law] is superior to the others and supreme. Other laws act upon us from without, but this is the internal law of our being, the law of man as man. He may infringe other laws as an animal, and be punished as an animal, but the transgression of this law is guilt, it is sin, if possible, even more unbending than the others.
>
> Ibid., p. 78.

In which category, then, would Hopkins have placed intemperance? Apparently he found it impossible to make a satisfactory distinction between moral and physical laws, virtue and health; although he did maintain that man was not merely the product of natural laws.

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in Boston in the Spring of 1830 heard its president declare that

> the blessed cause of human improvement, the spread of the Gospel, and the universal regeneration of the world, can never be successfully carried forward without the aid of the great work which we are now assembled to advance;

that is, the work of conquering disease and making glowing health possible by dietary and physiological investigation and diffusion of the knowledge thereby gained.[139]

The sentimentalism that informs the naturalistic outlook described in the preceding pages should not be overlooked. It enters formidably the educational theory and practice advocated by the Baconians, and is a focal point of attack by the humanist-minded. Besides, the very sentimentality of the age that honored Mrs. Hemans and sighed over the poetic sweetmeats of Mrs. Sigourney[140] is itself a token of scientific naturalism. For whatever their apparent differences, sentimental and scientific naturalists come together on the primary concept that man is a congress of natural forces, and virtue the 'natural' operation of those forces. The naturalist, be he of the scientific or

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[139] N. Am. Rev., XLVII (1838), 383.

[140] On the popularity of Mrs. Sigourney, the "American Mrs. Hemans," see G. S. Haight, Mrs. Sigourney, the Sweet Singer of Hartford (Yale University Press, 1950), Preface and pp. 38, 77-78, 107.

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sentimental variety, proceeds, in the words of Irving Babbitt, "to discover harmonies instead of discords in himself and outer nature." "He not only sees virtue in instinct but inclines to turn virtue itself into a 'sense,' or instinct."[141] In other words, only a very slight alteration would have been necessary to make a Wordsworthian into a phrenologist as well--who might then have sung:

> One impulse from a cranial node
> May teach you more of man,
> Of moral evil and of good,
> Than all the sages can.

It should be already discernible that the naturalism of the Scottish philosophers was informed by sentimentalism as well as scientism. Underlying their thought was the conception of the true and the good as the 'natural,' the false and the evil as perversion of the 'natural.' Man had to depend for guidance upon his 'moral feelings' aided by judgment or reason (the latter being given a subordinate monitory or advisory function by exponents of the school).

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[141] Rousseau and Romanticism, p. 44.

Thus the Reverend George W. Burnap leaves to natural impulse the task of correcting natural impulse! He holds that "it is much safer to cultivate" the 'natural affections' than "to study any abstract rules dictated merely by the understanding, and the sense of propriety"--the "blessed spirit of humanity [i.e. benevolence] must come in, and subdue the swelling heart [i.e. swelling with pride, ambition, envy] to the simplicity of a child." Lectures to Young Men, pp. 77-81. At the same time he declares, in connection with intemperance, "My hope is mainly in the dissemination of correct physiological knowledge upon the subject." Ibid., p. 135.

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Conformably, the proper education would be 'natural'--that is, one allowing full and unhampered development to the 'natural' moral feelings. Reason was depended upon only to determine the educational means of promoting the good 'felt' by the moral faculties.[142] The ideal product of such an education would be an organism in which nature pure and unperverted held sway.

Despite the fact that the Scottish philosophers accorded man moral and intellectual powers denied to 'brute creation,' they nevertheless, as I have already said, anchored man securely in nature. They do not suggest--in fact they explicitly deny--any cleavage between so-called higher and lower laws. Stewart conceives of the passions in man as acting "beautifully" in accord with the ends of nature, which are also the proper ends of man:

> Even in those rude periods of society, when, like the lower animals, he follows blindly his instinctive principles of action, he is led by an invisible hand, and contributes his share to the execution of a plan, of the nature and advantages of which he has no conception. The operations of the bee, when it begins for the first time to form its cell, convey to us a striking image of the efforts of unenlightened man, in conducting the operations of an infant government.[143]

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[142]Stewart, op. cit., II, 21-35, 243-245; Reid, op. cit., Conclusion, p. 209; Reid, Essays on the Active Powers of Man, passim, especially Third Essay, ch. vi; Adam Smith, "The Theory of Moral Sentiments," in Works, I, passim.

[143]Op. cit., I, 136.

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Owen illustrates, again, the confluence of Baconian and sentimentalist. He is what Babbitt terms a "soft temperamentalist." His thoughts on "enlightened selfishness" were part of the Rousseauistic current.[144] The concept of "enlightened selfishness" signalizes faith in natural impulse fully developed. The natural is the 'balanced.' The appeal to natural instinct is appeal to the good. That the sentimentalist of Owen's type also depended upon reason, acting through science, to aid in achieving the naturalistic millennium did not seem to cause any sense of incongruity. Reason was important--in its place. It was expected to take care of the details of instrumenting the brave new world. But reason would ultimately bring us to understand that instinct (or natural sentiment) should be our guide, as also how best to arrange things so that it can be our guide! Dependence upon natural impulse, upon sentiment--trust in man's natural benevolence--'follow the dictates of thy heart'--the tearsome and sensitive character--poetic chimney sweeps and Mrs. Hemans--all are either explicit or implicit in the humanitarian and Baconian Owen.

The Promethean motif and the naturalistic point of view also (and perhaps more obviously) make a coherent whole. This can be illustrated by certain of the opinions expressed

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[144] Literature and the American College, pp. 60-62.

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by James Renwick in the introduction to a course of lectures delivered during the winter of 1824-5 at the New York Atheneum.[145] In his introductory lecture Renwick endeavored to impress his audience with the social importance of science and technology by reminding them of what it means to want the tools that augment man's native physical power.[146] He points out that social advancement through mechanical science is not alone a matter of improved transportation or expanded commerce increasing the comforts and amenities of life and strengthening the 'bond of union among the members of the great family of mankind'; but also that such physical advancement is the necessary foundation for man's moral and intellectual improvement.[147] In the first place, he does not overlook the aid to piety afforded by natural theology, which levies for evidence upon the findings of science.[148] Secondly, he insists that man must be "civilized" by extensive control over his physical environment before he can develop or be receptive to the sciences of mind and society. Thus Promethean progress becomes a prerequisite for all progress. Hence we are apprised:

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[145] Printed in New York Review and Atheneum, II (Dec. 1825), 38-48; (Jan. 1826), 100-106.

[146] Ibid., pp. 100-103.

[147] Ibid., pp. 40-42.

[148] Ibid., p. 42.

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> The advancement of the science of the mind always follows, at a humble distance, the march of mechanical improvement, and until the latter is successfully cultivated, the former remains without either eyes or hands, and is incapable of any useful application. Of what value, may it be asked, would be political economy, were the arts that conduce to national wealth, in their infancy? Or how would the purest system of Ethics be regarded, by a horde of half naked and starving savages, destitute of the useful arts, and ignorant of the principles whereon they are founded? Vain, too, would be all reasoning upon the ideas derived from our senses, where the mechanical structure of the organs is not understood; we should hear of no speculations on the existence or non-existence of matter, when the speculator was compelled to labour without mechanical aid for the daily support of his body.[149]

This does not, of course, presume to place the origin of philosophy and morality in the physical conditions of life, but it does leave no doubt as to a belief that the moral and intellectual state of man is dependent upon his physical state. The sociologist need argue nothing further than that. Physical environment conditions mind and heart--control environment and you control mind and heart. The control is possible because of the intimately related influences of science and technology on the one hand, and of the mind and heart of man, on the other. That is, (1) scientific progress associated with practical needs makes for daedalian

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[149] New York Review and Atheneum, II, 41-42.

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progress, the latter bringing the civilized conditions of living which, in themselves, are propitious to virtue and intellectual development (because human wants are peacefully satisfied and leisure obtains for study); then (2) such progress in civilization stimulates further advance in science, which means further technological advance, etc., etc.; and (3) when science is sufficiently advanced to impress man with its power, it is seen as having more extensive scope, as being applicable even in the study of man himself. Consequently man becomes the object of systematic study and there is developed a true science of man, by which human behavior may eventually be directed and a superior race may be formed. Science then increases the power of man over himself in a twofold manner: by affording him control over nature external to and nature within man. Herein lies social duty and the hope for the future. "It is," Owen had declared,

> evidently the whole duty of man for his own sake, and for the benefit of his race, to find out the laws of his nature, that he may first know what manner of being he is, and then form all his institutions to be in strict accordance with these divine laws. He will then by the natural progress of knowledge, bring about a new state of existence, in which the duty, the interest, and inclination of all will be, at all times, one and the same feeling. In which all will possess, in security and without opposition from any quarter, a full supply, at all times, of whatever is essential to the happiness of human life.

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The scientific approach then is the means by which all this may come to pass. Hence, what knowledge can possibly be more worth than that offered by Science: the vigorous lady holding aloft the torch of true wisdom, illuming the one and only path back to Eden and the recapture of man's pristine innocence.[150]

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[150] Debate, p. 159.

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Part Two

The Baconians and Education

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CHAPTER I

"Education for the Business of Living"

Under the impact of Baconianism, and not without conflict, education was undergoing transformation. Writing for the North American in 1836 Professor Caswell of Brown[1] attests to contemporary agitation over the content of higher education. "The truth is," he remarks,

> the public mind, from some cause or other, has been for several years in a morbid, restless, feverish state upon the subject of college education. At one moment, the current of opinion is strongly opposed to an extreme study of the ancient classics; at another, the exact sciences become the subject of relentless proscription; at still another, the abstractions of metaphysics are vehemently assailed as a remnant of the scholastic jargon of the dark ages. Numberless, in turn, are the reasons for throwing all these out of the list of subjects, and for making education practical.[2]

This controversy, for which Professor Caswell hesitates to assign a cause, resulted, of course, from the activities of educational reformers who anticipated the opinion of Dr. Dewey that if education "is to bear any relation to the needs and opportunities of contemporary life," and is thus to "prevent intellectual and moral chaos," it "must take account of

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[1]Professor of mathematics and natural philosophy; became president of Brown in 1868.

[2]"Principle of Emulation," XLIII (1836), 497.

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in the most radical way" the three great interrelated movements of modern times: "the rapic growth of democratic ideals and institutions, the transformation of industrial life," and "the development of experimental science."[3] In 1824 one writer for the United States Literary Gazette was contending that it would be a mistake if education did not adjust to the conditions of a progressive and energetic age:

> We are much in the wrong if the effect of this state of things be not, to give new importance in education, to the study of human nature and to the arts more immediately exercised in social intercourse, and to throw into the shade the merely speculative and learned acquisitions.[4]

This then is the mood of the Baconian as educational reformer. Education was to share and to instrument the general progress of the human race. To do so involved the orientation of schools to the putative needs of modern society--their application to the task of producing properly cultivated men and women to people the brave new world and to further its high destiny. It involved emphasis upon scientific and technical studies as the source of power and enlightment. It meant the ascendancy of the experimental temper. It meant the extension of scientific and sentimental naturalism into pedagogical theory and practice. "Without making pretension to

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[3]"Philosophy of Education," A Cyclopedia of Education, ed. Paul Monroe (New York, 1919), IV, 702.

[4]"On the Growth of the United States of America," I (1824), 11.

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the gift of prophecy," wrote one Baconian in 1825,

> or to more than an ordinary share of human sagacity, we are much mistaken in the whole spirit of our times, if the education of the young is not about to assume an importance in the public estimation, which it has never yet assumed, and to be conducted upon more consistent and philosophical principles than have ever yet been reduced to practice in this country.[5]

As the nineteenth century advanced the academic world responded increasingly to the Baconian demand that education conform to the new conditions and utilize the new forces resulting from the interrelated development of democracy, science, and technology. The success of the Baconians was marked by accelerated change: from the rise of academies with their dual curriculum to the establishment of separate and generously endowed technical schools; from the endowment in 1816 of a chair "on the application of science to the arts"[6] to the bequest in 1847 by Albert Lawrence of $50,000 for a scientific college.[7] Under social pressure the foundation of the culture of the individual was shifting from languages and religious discipline to physical science and

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[5] U.S. Lit. Gaz., III (1825), 172.

[6] The Rumford professorship, under endowment of $28,000. Samuel A. Eliot, A Sketch of the History of Harvard College (Boston, 1848), p. 180.

[7] Ibid., p. 184.

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social analysis.[8] In educational theory the modernist argument followed the lines already indicated: modern man, in erecting an unprecedentedly enlightened and democratic society on the dual foundation of Christianity and the Novum Organum, had made necessary an education in which the limited (if not altogether fallacious) ideas of the ancients merited little, if any part. Further, since it is science and its practical application to which modern man is primarily indebted for his superiority, the new education must aim at equipping the individual with that scientific and technological knowledge essential to the maintenance and expansion of the advantages already derived. In other words, society, having begun to advance towards the millennium by means of the power conferred by science and technology, must provide training that will ensure the continued possession, even enlargement, of that power.

It was obvious to the Baconian that the technological equipment of the brave new world necessitated trained men

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[8]At this period the influence of religious institutions in American education was still strong; but occasionally even then controversy arose over the question of excluding religious instruction from schools. Note, for example, that this question was broached in connection with the famous Girard bequest. Cf. Francis Lieber, A Constitution and Plan of Education for Girard College for Orphans, with an Introductory Report, Laid before the Board of Trustees (Philadelphia, 1834), pp. 18-19, 34-40. It should be noted that the cause of non-sectarian common schools was culminating successfully before the middle of the nineteenth century. See Appendix V, p. xii.

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for its maintenance and improvement. Concomitantly he was susceptible to democratic ideas. For as the power of the daedalian became increasingly manifest, so grew in his estimation the social importance and prestige of the working population entrusted with that knowledge. Accordingly the new education would have to be universal and adapted to the common needs--politically and industrially--of the common man. That is, a democratic society must train up all its citizens to a comprehension of social law and physical law: it must have both intelligent citizens and intelligent workers: responsible trustees of the political power which is theirs and adequate guardians of the scientific and technological power that makes possible a democratic society in the first place.[9] "Freedom, the first born of science," Jefferson had written.[10]

The relationship of Baconianism to democracy, and particularly to the free school movement, not being central to my study, need detain us but briefly. It should, however, be remarked in passing that the utilitarian bias of educational reformers was associated with democratic preconceptions, and that opposition to the emphasis upon the ancient languages derived partly from the same source, and besides could be

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[9]See Appendix V, p. xii.

[10]Quoted by Cyrus W. Adler, "Jefferson as a Man of Science," in Writings of Thomas Jefferson, XIX, p. iii.

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reinforced by the conviction that an age which had elevated the common man was superior enough to be justified in dispensing with, or at least subordinating, classical studies. It should also be noted that the democratic movement is related to naturalism in that both postulate the natural goodness of man; both have in their rationale the concept of natural law involving the idea that to be free is to be natural, to be natural is to be pure and sound. The doctrine of the natural rights of man was the political counterpart of the pedagogical idea of the sovereignty of nature in education. We shall see in such individuals as Timothy Flint and Horace Mann how intimately associated could be democratic ideas, utilitarianism and naturalistic pedagogy.

The principal object of this part of my study is, however, to reveal further than I have already done, the mental atmosphere in which the new pedagogical movement thrived. Specifically, it will attempt to show how ideas of social utility and of the destiny of America, ideas about the power of scientific and technological knowledge and about the pedagogical value of science, informed the Baconian movement in education. These, it will be shown, were the ideological weapons used by the reformers in their attack on the old curriculum.

To the Baconian in education, considerations of social utility were the considerations of enlightenment. "Useful

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knowledge," generally diffused, was "the safeguard of the nation's stability and prosperity."[11] Dr. Griscom takes it as a hopeful sign that "useful learning is doubtless making a more rapid progress than it has ever done on both sides of the Atlantic."[12] Walter Johnson of the Franklin Institute argued that a truly republican education was a practical education as well as one available to all classes of men.[13] And we find a contributor to the New England Magazine assailing long working hours because they obstruct the diffusion of useful knowledge so vital to social well-being:

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[11]Charles F. Mercer, A Discourse on Popular Education; Delivered in the Church at Princeton, the Evening before the Annual Commencement of the College of New Jersey, September 26, 1826 (Princeton Press, 1826), pp. 10-11. The association of social utility with the aims of the free school movement was inevitable. This is borne out in the evidence cited in Appendix V.

[12]Year in Europe, II, 516.
Of Griscom's Year in Europe, Henry Barnaro said:

> No one volume in the first half of the nineteenth century had so wide an influence on the development of our educational, reformatory, and preventive measures, directly and indirectly, as this.
>
> Quoted in Will S. Monroe, History of the Pestalozzian Movement in the United States (Syracuse, 1907), p. 208.

[13]"On the Combination of a Practical with a Liberal Course of Education," Journal of the Franklin Institute, II (2d series) (1828), 55-57 (reprinted AJE, III, 28), 600-609). The idea expressed also in AJE, III, 747-748, IV (1829), 40-53; N. Beman, The Intellectual Position of Our Country: an Introductory Lecture Delivered before the Young Men's Association for Mutual Improvement, in the City of Troy, December 10th, 1839 (Troy, 1839), pp. 14-15.

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> We are aware of the general belief, that the study of the sciences is not necessary with the mass who are engaged in the various active pursuits. But this narrow view is fast going out of date. The intimate connection between the arts and sciences, is beginning to be more extensively acknowledged. The progress of steam, if nothing else, will, ere long, convince the most incredulous, that the great mass of mankind were made for something beside mere machines.... This connection between science and art affords, to our mind, one of the strongest arguments in favor of republican institutions; from the fact, that where it is well understood, and opportunity for study is allowed, it induces a mental discipline eminently calculated to fit the community at large properly to appreciate and sustain them.[14]

It was not, then, merely consideration of the exigencies of a young nation in process of construction that could justify America's utilitarian bias. Need America apologize for its skill and its sober industry? Should it be doubted that concern for the cui bono is a positive social good? The American Magazine of Letters and Christianity, for one, was indeed gratified that, "of all people the Americans are those with whom the cui bono is the first and the last question."[15]

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[14]"A Plea for the Laboring Classes," IX (1835), 431.

[15](Princeton, N.J.), I (1826), 129. James Fenimore Cooper, impressed with the ingenuity and energy displayed by Americans in daedalian achievement, held it to be

> in itself a prodigious triumph to a young people to have given form and useful existence to the greatest improvement of our age--[the steamboat].

Notions of the Americans, II, 152-153. Vid. ante, pp. 19-21.

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Certainly there was nothing apologetic in the assertion of Andrews Norton that "our plans of education are suited to our necessities," and that

> it is not worth while for us to adopt from European education traditionary usages, which ought long since to have become obsolete; and from which it would be happy for them if they could deliver themselves.[16]

John Henry Hobart too deemed it a mark of social superiority that American education should be governed more than European by consideration of social utility; and he felt that America could pride herself not alone because of preëminence in "civil and religious institutions," but also because her system of higher education "embraces a larger scope of science in connection with efficiency of operation ... than some foreign institutions."[17] To ascertain the most suitable education for America, the Reverend Benjamin Peers, advocate of a 'system of national education,' would consult actual needs in the workaday world.

> I would station myself beside 'the stump' and the ballot-box, on the day of an election, and there learn the mental habits, and the information, requisite, to enable the farmers and mechanics, the principal voters of the nation,

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[16]"Professor Frisbie's Inaugural Address," N. Am. Rev., VI (1818), 240.

[17]The United States of America Compared with Some European Countries, Particularly England: in a Discourse Delivered in Trinity Church, and in St. Paul's and in St. John's Chapels, in the City of New-York, October, 1825 (2d edition, New York, 1826), pp. 12-13.

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> to distinguish the artful sophistry of the demagogue, from the manly logic of the friend of order and of the Constitution, and to choose, intelligently, between two candidates whose views of national policy may be as opposite as day and night. I would then repair to our legislative halls; and hearing the yeomanry of the country uttering their wishes, and opinions, through their representative organs, I would inquire as to the kind of education that will fit them for doing so with wisdom and safety. Thence I would go into the business walks of life, to ascertain what knowledge of things, and principles, is needed to facilitate the task of getting honestly a comfortable livelihood. In the social circle, next, I would learn the mental qualifications necessary to make recreation rational and profitable, as well as pleasant. Then, by the domestic fireside, I would determine the amount of moral science requisite for a wise discharge of the duties of the father, the son, the brother, the relation, the neighbor, and the friend. And lastly, beneath the shadow of the sacred desk, I would form my views of the attainments which are essential to fit a man for being happy in the faithful discharge of all his duties upon earth, and to prepare him for the purer blessedness of Heaven.[18]

Through the early decades of the nineteenth century educational reform in the direction indicated by Peers was persistently urged and approved. It became associated with

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[18] American Education: or Strictures on the Nature, Necessity, and Practicability of a System of National Education, Suited to the United States (New York, 1838), pp. 99-100. This Rev. Peers established a Mechanics' Institute in Lexington, Ky., in 1829, and in 1830 an 'Eclectic Institute' wherein Pestalozzian principles were applied. In 1838 he became editor of the Journal of Christian Education.--Dictionary of American Biography, XIV, 389. His career thus symbolizes the representative Baconian mind--a mind in which were blended Hebraic, Rousseauian, and utilitarian dispositions.

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the cause of female education.[19] It was urged by religious leaders under the conviction that modern utilitarian progress and scientific knowledge bear a direct relationship to piety and morality.[20] It was sponsored by the foremost educational

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[19]Catharine E. Beecher, Suggestions Respecting Improvements in Education, Presented to the Trustees of the Hartford Female Seminary (Hartford, 1829), pp. 7-10, 58-59; D. D. Barnard, Introductory Lecture before Troy Young Men's Association, pp. 12-13; Joseph Emerson, Female Education, a Discourse, Delivered at the Dedication of the Seminary Hall in Saugus, Jam. 15, 1822((Boston, 1822), pp. 9, 12-16; Thomas H. Gallaudet, An Address on Female Education, Delivered, Nov. 21st, 1827, at the ... Hartford Female Seminary (Hartford, 1828), pp. 9-15, 23-31; John T. Irving, Address Delivered on the Opening of the New-York High-School for Females, January 31, 1826 (New York, 1826), pp. 20-21; New York Mirror, IV (1826), 75; Port Folio, XVIII (1824), 58. William B Sprague, Letters on Practical Subjects, to a Daughter, 2nd edition, New York, 1831.

[20]This idea was, of course, frequently associated with the argument for popular and 'useful' education as essential to political stability. Cf. "American Library of Useful Knowledge," N. Am. Rev., XXXIII (1831), 518; B. P. Aydelotte (president of Woodward College, Cincinatti), "Thoughts on American Education," Western Acacemician, I (1837), 251-261; N. Beman, Intellectual Position of Our Country, passim; Nathaniel Brown, An Address Delivered before the Wayne County Education Society, at Its First Meeting, ... January 22, 1831 (Palmyra, N.Y., 1831), pp. 3-4, 13-14, 21-23; W. E. Channing, "Self-Culture," Works, II, 347-411; W. E. Channing, "Lectures on the Elevation of the Laboring Portion of the Community," Works, V, 153-230; Philip Lindsley, "Address, Delivered in Nashville, January 12, 1825, at the Inauguration of the President of Cumberland College," Works,I, 13-66; P. Lindsley, "Baccalaureate Address ... 1832," Works, I, 277-306; "Baccalaureate Address ... 1834," Works, I, 307-320; S. Nott, The Freedom of Mind Demanded by American Freemen (Boston, 1830); S. Nott, "On a Proper Education for an Agricultural People," American Institute of Instruction Lectures, 1835, pp. 34-59; E. F. Stanton, "Manual Labor Schools, Their Importance and Connected With Literary Institutions,"

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organ to appear before Barnard's--William Russell's American Journal of Education. The "Prospectus" introducing the first issue of the American Journal of Education displayed at once the editor's predisposition to encourage reforms designed "to adapt the character of instruction to the progressive requirements of the public mind."[21] "There is," wrote William Russell in his first address to the public, "a deep and strong tide of opinion already undermining all that is useless and cumbrous in instruction." And, humbly, he anticipates that all the educational reformer can now do to aid "the current of improvement ... already flowing" is to contribute "a proportion of service to so good a cause."[22]

[Footnote 20, contd.]

South. Lit. Mess., II (1836), 244-252; Stephen H. Tyng, The Importance of Uniting Manual Labour with Intellectual Attainments, in a Preparation for the Ministry (Philadelphia, 1830), pp. 3-4; Henry Ware, Jr., "How to Spend a day," Works, I, 163-183; H. Ware, "Education the Business of Life," Works, III, 271-296; Francis Wayland, Discourse Delivered at the Opening of the Providence Athenaeum, July 11, 1838, Providence, 1838; Of course, there are Potter, Pierpont, George B. Emerson, and other religious leaders with a Baconian cast of mind, repeatedly noted in this study. Of course, these divines did not advocate a narrow utilitarian training. At times they expressed their hostility to overemphasis upon vocational preparation. They possessed a strong sense of the need for moral education, and often some loyalty to the 'liberal' tradition in education. Mark Hopkins, it may be noted, was satisfied that the colleges were keeping abreast of the 'spirit of the times' in augmenting the curriculum. "Inaugural Discourse Delivered at Williams College, Sept. 15, 1836," in Miscellaneous Essays and Discourses (Boston, 1847), pp. 245-247.

[21] AJE, I (1826), 1.

[22] Ibid., p. 5.

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Russell, who had been trained under Jardine at Glasgow, and who combined the influence of Scottish philosophy and Pestalozzianism,[23] thus dedicated the Journal, from its inception, to an experimental and 'forward looking' policy. And its content carried out the editor's intention. Russell reprinted copious extracts from the Outlines of Philosophical Education[24] of his erstwhile Glasgow master, reprinted them with the express hope that the work would "be speedily introduced in every college and in every preparatory seminary in the United States."[25] From its first issue, the Journal

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[23]"William Russell," Barnard's American Journal of Education, III (1857), 139-146; Will S. Monroe, History of the Pestalozzian Movement in the United States (Syracuse, 1907), pp. 130-131.

[24]Glasgow, 1825. The reprinted portions appeared in AJE, I, 552-553, 582-594, 641-650, and later issues.

[25]AJE, I (1826), 550:

> The book will be equally serviceable to students and to instructers. It will 'breathe the breath of life into the whole form of instruction....'

It should be noted that Jardine, although according respect to the classical languages, did not feel

> that the literature of antiquity should engross the exclusive attention of young men at college, from day to day, and thereby preclude the study of those more important branches of knowledge which lay the foundation of professional eminence, in the several departments of active life. The labors of the school boy should not

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contained articles sympathetic to the Baconian spirit and to such associated educational 'innovations' as the monitorial system and Pestalozzianism.[26] Beginning the fourth year of its existence (1829), it announced, as we have seen, its intention"to advance the interests of the Lyceum" as part of a program to create greater support for "the dissemination of useful knowledge, and the application of science to the practical pursuits of life."[27] For his own part the editor emphatically maintained that in the interests of elevating the common people--as accorded with the professed spirit of American society--

the elements of all useful science, and especially

[Footnote 25, contd.]

> be allowed to employ the more mature talent of the man; nor should the mere study of Latin and Greek words be permitted to supersede the investigation of modern science, and those sublime researches into the properties of matter and of mind, which have remunerated the labors of philosophy during the last two hundred years.
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> AJE, I (1826), 585; also Jardine, op, cit,, pp. 420-421.

[26]Many of the references to the Journal made here indicate this; then they may be supplemented by a random glance through any volume of the Journal or of the Annals, edited by Russell's successor, Woodbridge. Among the contributors to the Journal at this time were A. Bronson Alcott, Thomas Gallaudet, William C. Woodbridge, James Carter, Walter Johnson, and Josiah Holbrook--some of these, notable Baconians. Cyclopedia of Education, III, 563.

[27]Vid. ante, pp. 4-10.

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> those which enter into the occupations of the farmer and the mechanic, should form a part of the education in the common schools of the whole country.[28]

He complains that Greek and Latin (and even mathematics)

> are become a monopolising [sic] company, privileged to consume almost exclusively the time and the labor of youth, for several of the best years of life; no matter whether the candidate for admission to college has acquired the ability either to write or speak a decent sentence in his native tongue.

"Public sentiment and private effort are indeed," he is willing to admit,

> silently correcting this intolerable abuse. But neither in this nor in any other department of education, should improvement be obliged to steal in unawares. If we are indeed convinced that our standard of instruction is ill adapted to actual use, there should be no reverse about the introducing of reformation. Usage, how venerable soever by antiquity, should at once give place to the demands of present utility.[29]

Of college education he has a similar complaint. Here he is unmistakably the Baconian of "hard temperament." He would have college promote "energetic habits" for efficiency in a Baconian world of action.[30] "Scholastic habits," he contends,

> with their attendant mental inefficiency are

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[28]"Prefatory Address," AJE, II (1827), 4-5.

[29]Ibid., p. 9.

[30]Ibid., pp. 8-9.

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> all too predominant in college life; and with all respect for classical literature and mathematical discipline, we believe that they occupy a most unreasonable proportion of a student's time and attention; if the estimate is to depend on a regard to the actual state of society, and the nature of public business in most of its departments.[31]

Were we, he anticipates, to apply these considerations to educational reform, an "impulse" would thereby be given to society, "such as it never has received, and to which generations to come" might "look back as an epoch in the history of improvement."[32] In the meantime we can but deplore that "the idea of using education so as to make it produce better farmers, better mechanics, better practical men in any department, is but struggling into existence"; and confess to a willingness to see classical learning "displaced by more humble and more useful learning."[33] In fact it was the editor's

> deep conviction that extensive and effectual measures for the general improvement of education can never be taken, until a spirit of improvement and a disposition for information become prevalent in this community, with regard to the progress of the useful arts and sciences.[34]

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[31] Ibid., p. 9.

[32] Ibid., p. 13.

[33] "Defects of Liberal Learning," ibid., p. 74.

[34] This in connection with a notice (AJE, III, 320) of The New England Farmers' and Mechanics' Journal, "conducted

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In accordance with this spirit Russell's Journal wholeheartedly endorsed the report, commissioned by the Massachusetts legislature in 1835,[35] which proposed a tax-supported "seminary" of practical instruction for "the great classes of merchants, mechanics, and farmers."[36] Into their proposal the Commissioners swept the whole Baconian argument. They integrated the ideal of a 'classless' society[37] and the cause of a popular education for the practical duties of life. But they held the provision of a useful education for the masses to be imperative not only because of the American social ideal, but also because it was conductive to the

[Footnote 34, contd.]

by E. Holmes, M.D., Professor of Chemistry, Natural History, and Agriculture in Gardiner Lyceum."

[35]"Report of the Commissioners, Appointed by a Resolve of the Legislature, Passed on the 22d February, 1825," reprinted AJE, I (1826), 86-95, 144-160 (under title "Proposed Institution in Massachusetts").

[36]Ibid., pp. 86, 89. "We repeat our hope," wrote William Russell, "that the proposed seminary will at once receive a place among the institutions of our States." Ibid., p. 86. Governor Lincoln of Massachusetts emphasized the need for the proposed institution and requested action on the proposal in his address to the legislature, May, 1826. Ibid., pp. 434-436.

[37]The Commissioners believed that "a deep sense of the equality of privilege" is "the foundation of the safety of governments." Ibid., p. 148. Hence they strongly supported the idea of common school education. Loc. cit., also AJE, II, 147-148. The proposed seminary would have been a school on the secondary level. The proposal was defeated, however, "by existing and endowed institutions." Barnard's American Journal of Education, VIII (1873), 268.

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progress of all civilization. "With us," wrote the Commissioners,

> it has become an axiom, that the preservation of free institutions, without great intelligence in the people, is impracticable. The inquiry now is, whether we are to rest content with what we have done, whether we shall remain stationary; or rather whether we shall retrograde, for in human improvement, in man or nations, there is nothing stationary. Every where else, in Europe, as well as in our own States, all is excitement, effort, and struggle. This is a country of business and labor. Hence arises the necessity of giving dignity to labor, as the duty, virtue, and happiness of an American citizen.[38]

The errors of past ages must not be repeated here, the Commissioners insisted: It is emphatically not the 'order of nature' that "imbecility and abject degradation" should be the lot of the governed many, and education, with the power it accords, restricted to the governing few.

> No, this is not the order of Providence, but, rather, that individuals and nations shall advance indefinitely, in all that knowledge, which, expanding the intellect, and purifying the morals, makes man a religious being, and thus places him in a state, in which he cannot be badly governed.[39]

And America must light the way to truth for all nations:

> Let us ... realise sic our superiority, claim it, assert it, set it forth to the world, and maintain it, by all the means which God has put

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[38] AJE, I, 87.

[39] Ibid., p. 88. Note, again, that it is a 'practical' education which is to contribute to moral and intellectual progress.

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in our power.[40]

As for the kind of education that will help further the cause of human betterment--it must be adapted to the needs of the strenuous, practical life; it must consist of those studies that equip for the 'business of living': French and Spanish (because "we are a commercial people"), English, bookkeeping and arithmetic, geography, history, drawing, mathematics "in its largest sense," natural philosophy, chemistry, agriculture and horticulture, moral philosophy, and political economy.[41] The report further suggested an appropriation of $15,000 for 'philosophical' and chemical apparatus, tools, mechanical, mineralogical and botanical exhibitions and specimens, maps, charts, and globes.[42] It also contemplated the establishment of lectures for the general public "in particular departments; as for instance, in practical mechanics, in chemistry, and other branches of

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[40]Loc. cit.

[41]AJE, I, 89-93. The possession of practical knowledge seems to be the very basis of a civilized state:

> In a country in which, to our honor, business is a distinction, instead of the ability to be idle, these branches are essential. Between the man who has, and the man who has not the power of figures, the difference is so great, that they seem hardly to belong to the same race.
>
> Ibid., pp. 90-91.

[42]Ibid., p. 145.

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natural philosophy."[43] All the courses offered by the institute were to be designed to enable the people as farmers, merchants, and mechanics to practice their vocations with "greater profit, success, and pleasure"; and as citizens to exercise their public duties with benefit to the state.[44] Hence, the proposed plan of instruction even embraced such things as displays of agricultural specimens, experiments with labor-saving machines and with different varieties of plants and animals, as well as instruction in the principles of political economy.[45] The Commissioners were convinced that individual and social melioration, dependent upon power, lay in that direction.[46] They meant

> to propose nothing for this school, that is showy, expensive, and merely ornamental, but rather that which is useful and profitable, becoming the dignity and prosperous condition of an American citizen. If the time that has been devoted in the learned institutions of the world, to metaphysics, logic, and mystery, had been applied to the study of things that certainly do exist, instead of to those that may be, we should now have citizens better instructed in their duties, better morals, and better government.[47]

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[43] Ibid., p. 147.

[44] Ibid., pp. 154-156.

[45] Loc. cit. Vid. infra., p.245; ante, pp. 178-180.

[46] On the Commissioners' consciousness of 'power' in its relation to the daedalian, vide AJE, I, 155-156.

[47] Ibid., p. 154.

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Not that the Commissioners were hostile to college learning.[48] But it was nevertheless a "matter of astonishment" to them

> that a country, in which business and labor constitute distinction, there should have been no public provision made for the education of any class, but of that which is professional.[49]

It was not to be denied, they maintained, that the education provided by colleges is aristocratic in nature and unsuited to the requirements of life. It was censurable that the young should be compelled to devote "not less than four or five years ... to dead languages" (italics the Commissioners')--a waste, to all but a few students, of "the most precious" period of a youth's life. "We may venture to say," added the Commissioners,

> That education among us cannot long exist in a state like this. The system is foreign, and not American; there is little in it suited to our peculiar institutions, or becoming our rank in the world.[50]

When the Massachusetts Report of 1825 and two bills thereon were returned to the Commissioners for further deliberation, the result[51] was a reaffirmation of the Baconian

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[48] Ibid., pp. 152-153.

[49] Ibid., p. 152.

[50] Ibid., p. 153.

[51] Reprinted as "Practical Seminary in Massachusetts" in AJE, II (1827), 141-153.

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position of the first report. The Commissioners, as firm as ever in their Promethean faith, again explained that the diffusion of useful knowledge accorded with an elevated condition of society--was, in fact, essential to such a condition.[52] Since, so they argued, it has been demonstrated that the improved state of modern society results fundamentally from progress in the useful arts; since, moreover, the working classes enjoy due honor in our nation, "it may excite a little surprise" that we have

> not a single school, liberally provided for, in which those arts together with the sciences connected with them, are solidly and practically taught.[53]

Ancient and modern times both have sinned in this regard, the Commissioners charged. In past ages people did not understand the relationship between the useful arts and the prosperity and happiness of nations. The artisan was a slave, and his vocation condemned; the kudos of society were reserved for the fine arts, literature, rhetoric. And in later ages this same predisposition powerfully influenced education, with the consequence that "upon the revival of learning, if learning it could be called, Greek and Latin were added as indispensable appendages" to a barbarous the-

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[52] Ibid., p. 142.

[53] Ibid., p. 143. Had the Commissioners forgotten Rensselaer's school and the Gardiner Lyceum?

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ology, metaphysics, and logic inherited from the Middle Ages.[54] Indeed, literature is even today, they pointed out, the pivot of higher education. However, in the Commissioners' opinion, the mere grafting of technological studies upon the college curriculum would not adequately fill the need for technical education. For college courses are applied especially to the wants of the 'professional' and 'higher' classes; whereas the nation's principal need is an education fundamentally ordered to provide a useful training for the common duties of life.[55] Advancement with the times is our necessity, they insisted. Hence our path is clear:

> A new impulse must be given to the public mind, and we must be made to see that there are new modes of education, new books to be taught from, great improvements in the arts and sciences, and that the knowledge of these, can in no way so well be spread, as through the influence of an institution where they shall be practically and thoroughly taught to a large number of youth, who are to be fitted for the common business avocations [sic] of life.[56]

And the Baconian contemporaries of the Massachusetts Commission would have agreed that such steps were demanded by "the spirit of the age." With the Reverend Nathan Beman they repeatedly urged, through these early decades of the nineteenth century, that "practical and useful knowledge" is

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[54] Loc. cit.

[55] Ibid., pp. 144-146.

[56] Ibid., p. 147.

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"needed in every country, but ... is indispensable in this."[57]

Now by "practical and useful knowledge" they did not usually confine themselves to scientific and technical. Often, as we have seen in the Massachusetts Report of 1825,

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[57]N. Beman, Intellectual Position of Our Country, p. 14. Of available instances of utilitarian bias in education (other than those cited in the text), the following list represents but a small fraction. The authors were generally leaders in their communities, if not actually national figures. Cf.

"American Manufactures," Analectic Magazine, XIV (1819), 39-40; Amherst College Faculty, Substance of Two Reports (Amherst, 1827), pp. 4-8; A. D. Bache, Report on Education in Europe to the Trustees of the Girard College for Orphans (Philadelphia, 1839), pp. 101, 306-322, 362, 378-379, 542-602; De Witt Clinton, in Messages from the Governors, III, 62, 113-116; Thomas Cooper, "Principles of Political Economy," New York Mirror, IV (1827), 354-355; [A. H. Everett], "Popular Education," N. Am. Rev., XXXV (1833), 74, 88-94; Gideon Hawley, Instructions for the Better Government and Organization of Common Schools (Albany, 1819), passim; L. H. Parsons, Inquiry into Education, passim; Alden Partridge, "Discourse on Education," in F. Peyre-Ferry and A. Partridge, The Art of Epistolary Composition ... and a Discourse on Education (Middletown [Conn.], 1826), pp. 269-279; G. B. Perry, "On Primary Education," American Institute of Instruction Lectures, 1833 (Boston, 1834), pp. 95-128; "Report to the Senate, February 23, 1825 of the Committee on Literature, on the Petition of the Trustees of Geneva College," reprinted in Hobart, The Story of a Hundred Years, 1822-1922, Documentary Appendix, pp. 98-99, 126; W. H. Seward, Works, II, 198-210, 228-254, 281-287, 309-320, 334-336; III 128-134, 135-152, 164-175, 211-213; William Sullivan, "Introductory Lecture," American Institute of Instruction Lectures, 1833, pp. 1-37; G. Ticknor, Remarks on Changes Lately Proposed or Adopted, in Harvard University ([Cambridge], 1825), pp. 35-36; E. Washburn, "Extracts from an Address Delivered before the Worcester County Lyceum ... Oct. 28, 1829," AJE, II (1829), 534-541. Vide alsc AJE, II (1827), 471-481; III(1828), 43-46, 95-99; N. Am. Rev., XXIX (1829), 241-258.

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political economy was listed as indispensable to an education for practical life. Still more frequently emphasized was the need of religious and moral education for the proper fulfillment of the duties of life. All these, as well as science and its application, were for the representative Baconian the prerequisites of a prosperous and elevated society and the _desiderata_ of the new education. But predominant in the Baconian argument was the assumption that social advancement depends upon the promotion of science and technology. For that matter, both political economy and religion itself drew, or were thought to draw, strength from the influence of Athletic Science. It was pointed out that political economy, distinctive product of the modern mind, was based on scientific principles and to be honored accordingly. The Massachusetts Report just noted spoke of the great importance of the new body of knowledge, which "the labors of Smith, say, and others have rendered ... a science."[58] And the omniscient Dr. Thomas Cooper of South Carolina College, also denoting it "a _science_ of modern date,"[59] urged in his _Lectures on the Elements of Political Economy_ that colleges include political economy in their courses. To justify the issuance of the _Lectures_ he wrote:

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[58] _AJE_, I, 154.

[59] P. 8.

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> The culpable inattention in our country to a science of such extensive application, and the manifest ignorance or neglect of its first principles, among our Statesmen and Legislatures, seemed to me imperiously to call for some measures which should force into public notice a branch of knowledge, on which human happiness so much depended.[60]

The desire for greater sociological content in education was, of course, stimulated by the idea of the relation of the people to the state in a republican government;[61] but it is evident that the prestige of social science was to some extent derived from the promise of knowledge based on the 'scientific method.' True, religion and morals needed no levy, in America, upon the influence of science. Nevertheless one is never quite certain whether the Paleyan hosts,

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[60] Ibid., Preface, p. iii. "For we teach our youth in vain," here also declared Dr. Cooper, "unless we enable them to keep pace with the improvements of the day." The Lectures on Political Economy "served as a pioneer American text-book." Dictionary of American Biography, IV, 415. Cooper's view on the place of political economy in education was seconded by the reviewer of his Lectures for the N. Am. Rev., XXV (1827), 409-410. Cf. also Am. Quar. Rev., I (1827), 309. For other expressions of this sentiment, see: [O. Dewey], "Popular Education," N. Am. Rev., XXIII (1826), 62-63; A. Potter, Principles of Science, pp. 15-16; E. Washburn, "On Political Influence of School Masters," American Institute Lectures, 1835, p. 81; W. H. Seward, Works, III, 133. Here Seward combines political economy with other courses 'useful to the citizen':

> It is necessary, if we would be qualified to discharge the duties of electors, that we should understand some of the principles of political economy, of the philosophy of the human mind, and, above all, of moral and religious science.

[61] Vid. ante, pp. 265-269.

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with their variation on the 'watch theme,' were aiding religion or stimulating greater interest in science. Certainly they believed that science was the 'handmaid to piety,' yet at the same time Lord Brougham was eagerly illustrating not only how easily religious truths could be demonstrated by reference to nature, but how they could be determined with scientific certainty by inductive reasoning.[62] When the New England educator, the younger Samuel Nott, wanted to suggest a basic course of reading for popular enlightenment, the Bible was followed by 'Paley's and Gisborne's Natural Theology, Smellie's Natural History, Conversations on Chemistry and on Natural Philosophy'; "or to comprise many subjects in one cheap work, the Library of Useful Knowledge prepared expressly for the People."[63]

In any case, science and technology were becoming the pivot of educational reform; for science and technology were the fons et origo of power. There lay the hope of Promethean achievement upon which, to so many, civilization depended. The complaint voiced in the North American in 1832, that our education does not help us to "know enough of what is," came from an encomiast of the machine, inspired by the idea that

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[62] A Discourse of Natural Theology, 3d edition, London, 1835. An edition was published at Philadelphia this same year.

[63] Freedom of the Mind, pp. 61-62.

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"the glory of compelling the powers of Nature into the service of man, was destined to grace our own age."[64] To one partisan of 'useful knowledge,' writing for the Christian Examiner in 1829, the want of the intelligence requisite for the brave new world is to be known by the existence of the man

> who in all his life long turning over soils, of which he knows not the properties, or the process of improving, or who is using diagrams in mechanism, of which he understands none of the principles.[65]

Dr. Griscom, deeply sensible as he was of the progress already attained by modern man, felt convinced that much more had to be done--and by promoting, still further, scientific and technological knowledge, especially for the 'mechanic classes.' Again it was not alone a question of the need for enlightened citizens in a republic, but of the general advance of mankind. Education in the arts and sciences--therein lay the clue to the difference between enlightened and prosperous France, on the one hand, and stagnant China and India, on the other. As for America, her potentialities were tremendous. She possessed raw materials in abundance; she had extensive resources in water power; her citizens were highly gifted with "inventive talent and Mechanical ingenuity." Asks Dr. Griscom:

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[64] [S. C. Chase], "Effects of Machinery," XXXIV, 221, 228.

[65] "Diffusion of Useful Knowledge," VI (whole no.), 80-81.

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> What then is there wanting, to enable and to induce our countrymen, to enter more boldly and effectually, into the immense career of national industry, and national competition?

Doubtless many reasons might be advanced--reasons connected with political policies; but essentially it was a matter of practical education: the diffusion of a knowledge of science and the arts, the key to progress.[66]

Which opinion was shared by the Reverend Orville Dewey, who, in his scheme of education, would

> assign a much larger place than is commonly given, to the study of nature; that is, to natural history, chemistry, natural philosophy, and astronomy.[67]

True, in an education aiming "more directly [to] fit men for the actual business of life" Dewey would include more than the physical sciences; [68] yet to him also it is scientific advance which constitutes the very core of valuable learning and the basis of modern man's superiority. "It is indeed one of the peculiar and great undertakings of the age," he wrote in 1830,

> to communicate scientific knowledge to the whole intelligent portion of the mass of society. The energies of the social world, aroused as they

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[66] Importance of Character and Education, pp. 18-25.

[67] "Popular Education" (a review of Brougham's Practical Observations upon the Education of the People, 20th edition, London, 1825; Boston, 1826), N. Am. Rev., XXIII (1826), 59. The Reverend Dewey confirmed, of course, the Baconian views of the famous Lord Brougham.

[68] Ibid., pp. 61-67.

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> never were before, to the work of general improvement, are now, especially in England and in this country, directed particularly to this object.[69]

Antiquity knew nothing like it; "the records of Greek and Roman literature give no example or hint" of Libraries of Useful Knowledge or lyceums devoted to the diffusion of useful learning for the common man.

> The noble project of bringing down high philosophy and holy science to the mass of the people, has been reserved for this age. It is a novel enterprise among mankind. It is an unwritten page in the history of the world. It is a project, we do not think it too much to say, which never before entered into the conceptions of men; for it is an attempt to pluck from the sun, 'in the highest heaven of philosophy,' the Promethean fire, to burn on the common hearthstone in the humblest abodes of mortals.[70]

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[69]"Diffusion of Knowledge," N. Am. Rev., XXX (1830), 295-296.

[70]Ibid., p. 296. Dewey envisioned education as generally moving ahead in the advance of humanity. In his review of Brougham, already cited (n. 67), he wrote (pp. 51-52):

> It is an encouraging omen for the age that the number both of writers and readers on education is increasing; that many powerful minds are directed to this subject, and that public attention is beginning to awake ... and that men of the highest talents and education are taking up the professed business of teaching youth, not only in our universities and colleges, but in our lyceums, academies, and schools.... These combined circumstances, connected as they are with the free institutions and fortunate auspices of our natural condition, give rise to indefinite expectations of improvement, both in the principles and in the modes of education among us.

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To further the progress of this grand endeavor, Benjamin Tappan in 1832 requested that the Ohio Historical and Philosophical Society strive to advance science

> by collecting all the facts which may be known upon every branch of human knowledge, and by publishing such collections.[71]

Another orator, addressing the Troy Young Men's Association for Mutual Improvement in 1835, contends that "the spirit of the age" demands a practical education and that

> some knowledge of the sciences is necessary to every one who would qualify himself for extensive usefulness.[72]

And the American Institute of Instruction in 1838 heard the Reverend Charles White of New York State proclaim it a fundamental responsibility of teachers to augment the power of man over his physical environment.[73]

Education responded to Baconian pressure. No doubt it is gratuitous, in the present century, to mention the fact or to trace the incidence of Baconianism in our school system. However, for the sake of completeness, as well as

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[71]"Address Delivered before the Society at Its Annual Meeting in 1832," Journal of the Historical and Philosophical Society of Ohio, Part 1, Vol. I (Columbus, 1838; reprinted for the Society, Cincinnati, 1872), p. 28.

[72]Mark Tucker, Introductory Address, Delivered before the Young Men's Association for Mutual Improvement, of the City of Troy, on the 9th January, 1835 (Troy, 1835), pp. 15-16.

[73]Op. cit., pp. 1-29.

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to indicate the different ways in which, and with what objectives, the response took place, I should like to deal briefly with the subject. In my opening chapter the rise of the lyceum and the Mechanics' institute was pointed to as evidence of increased interest in daedalian learning. Both these agencies were directed, it was shown, to an education predominantly utilitarian.[74] In formal education the Baconian influence was at the same time being felt from common school through university. In the pleas for support of common school education heard so frequently during this period, the most prevalent argument, besides the need for an enlightened citizenry, was the importance of a practical education, eminently scientific and technological, to maintain the foundation of civilized living.[75] Already in the second decade of the last century we find middle schools with 'English Departments' intended to prepare youth for the common vocations of life, offering courses in the sciences and their application, together with 'practical' mathematics.[76] America

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[74]Pp. 4-10.

[75]Both contentions being frequently interwoven, of course. Cf. S. H. Blake, op. cit., pp. 4-11; AJE, I, 554; III, 147-148; U.S. Lit. Gaz., I (1824), 152-153; J. D. Hammond, op. cit. (James F. Cooper was president of the Otsego County Education Society, before which Hammond spoke. Ibid., p. 15.) Vid. also J. D[ewey], "Course of Study, Theory of," Cyclopedia of Education, II, 219-220. A large amount of support for the free school movement came from workingmen's associations. Cubberley, Public Education, pp. 173-174.

[76]The division of the curriculum into a "classical" and

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also produced schools on the Fellenberg plan, wherein manual labor, principally agricultural, was associated with academic

[Footnote 76, contd.]

an "English" department became quite common. The subjects of a 'useful' character offered, included English, mathematics, and physical sciences, as well as bookkeeping. Cf. AJE, I, 50-52, 186-187, 321-335, 440-441; II, 223-240; III, 233-234, 300-303, 420-426, 427-430, 492-493, 618-620, 680-684. The Statutes of the Albany Academy Passed December, 1816 (Albany, 1816), pp. 9-12, affords a detailed description of the courses in both the "classical" and "mathematical" (or "English") departments. As early as 1789 Benjamin Franklin had advocated an "English school" to prepare youth for the 'business of life,'--a school that would not require the study of languages other than English. "Idea of an English School, for the Consideration of the Trustees of the Philadelphia Academy," American Museum, V (1789), 475-476. Vide also Elmer E. Brown, The Making of Our Middle Schools, an Account of the Development of Secondary Education in the United States (3d edition, New York and Chicago, 1907),pp. 232-238; Cubberley, Public Education, pp. 245-247, 249-250; E. D. Grizzell, Origin and Development of the High School in New England Before 1865 (New York, 1923), pp. 32-33. Cf. also, on natural history in the academies, W. M. and M. S. Smallwood, Natural History and the American Mind (Columbia University Press, 1941, pp. 249-284.

There were efforts to institute the dual system in colleges also. Mathew Carey was a principal figure in a movement to establish a college on this order in Philadelphia. Cf. "Reflexions on the Proposed Plan for Establishing a College in Philadelphia, in Which English Literature, the Sciences, and the Liberal Arts Shall Be Taught: and for Admission into Which no Prerequisite of Having Learned the Latin or Greek Shall Be Necessary, Philadelphia, 1826; College in Philadelphia," AJE, I (1826), 566-568. Also note that the Amherst faculty recommended the dual plan in 1826-7, although retaining the Greek and Latin admission requirements. Substance of Two Reports of the Faculty of Amherst College to the Board of Trustees, With the Doings of the Board Thereon (Amherst, 1827), pp. 10-11.

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work.[77] Agricultural education was deemed especially suited to the needs of American society.[78] In 1824 David Hosack was urging the New York Horticultural Society to aid in the diffusion of scientific knowledge by establishing a botanical garden and conservatories, as well as lectures, classes and a library for furthering education in all branches of botanical science, from "the operation of manures" and "the composition of sods" to "the philosophy of vegetation."[79] Another exponent of agricultural education, writing in the New England Magazine (1831) contended that since

> at least five-sixths of the whole population of the United States are maintained by husbandry and gardening; it is, therefore, of the first consequence, that instruction should be universally disseminated, on all the branches of tillage.

"The time has arrived," this writer adds

> when a powerful impulse should be given to these great branches of national industry; it is required by public policy, patriotism, and a just regard to the rights and interests of the people.[80]

And before the American Institute of Instruction in 1835 the

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[77] See Appendix VI, p. xv.

[78] Cf. "Agricultural Education," Cyclopedia of Education, I, 58-60.

[79] "An Inaugural Discourse Delivered before the New-York Horticultural Society at Their Anniversary Meeting, on the 31st of August, 1824," Essays on Various Subjects of Medical Science, III, 21-26.

[80] "Horticulture," I, 148.

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Reverend Samuel Nott of Wareham, Massachusetts, held forth "on a proper education for our agricultural people."[81] "Knowledge is power," the Reverend Nott reminded his listeners; "and the education of an agricultural population should be such as to increase power by knowledge."[82]

"What better service," had asked the philanthropic Roberts Vaux some years before of the Pennsylvanis Agricultural Society,

> ... can this, or any other similar society render to humanity, than to animate the cultivators of the earth, both by precept and example, to the acquisition of scientific knowledge?

For Bacon's aphorism is as true of the husbandman's calling as it is of the artisan's or manufacturer's:

> Daily observation confirms the truth of Lord Bacon's sentiment, that 'knowledge is power.' It is the knowledge of Principles which enables our mechanics, artizans, and manufacturers to perfect, as they do, their various products; and all the difference observable between the rude efforts of the ignorant, and the well finished specimens of the instructed, is attributable to that superior skill which, with proper exertions, lies within the reach of all. Will not science, in like manner, augment the efficiency of the husbandman's labours, and secure to him more abundant rewards?[83]

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[81] American Institute of Instruction Lectures, 1835, pp. 35-59.

[82] Ibid., p. 46. For purposes of illustration he adds (loc. cit.):

> How knowledge is power in agricultural affairs is everywhere manifest in the use of the lever for saving and multiplying manual strength.

[83] "Vaux's Address," Port Folio, XIX (1825), 17.

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Hence he would have schools on the Fellenberg plan established in Pennsylvania, from which

> young men would go forth in every way qualified to teach and to illustrate by their example, this truth, that sound religious and moral principles, united with liberal scientific knowledge, carry to the greatest height individual prosperity and public benefit, in every neighborhood where their influence is exerted.

"We might," he adds,

> look to such nurseries for able advocates of public measures, fraught with inestimable blessings to our great commonwealth; and who can predict the extent of our moral grandeur which from such an application of intellectual force, may distinguish succeeding generations.[84]

The founders of the Gardiner Lyceum (1823) were also conscious of Fellenberg's school at Hofwyl as an archetype,[85] as well as convinced that such schools as their own and Rensselaer's (1824) had their "origin in the wants of the community."[86] Hence the courses offered were predominantly scientific and technological. According to its constitution, the purpose of Rensselaer Polytechnic was to instruct "in the application of science to the common purposes of life."[87] Stephen Van Rensselaer had written:

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[84] Ibid., p. 19.

[85] Catalogue of the Gardiner Lyceum, October, 1824, quoted in U.S. Lit. Gaz., II (1825), 363. George Ticknor in his Remarks (p. 36) called it "the admirable and flourishing institution at Gardiner, in Maine."

[86] U.S. Lit. Gaz., II (1825), 361; AJE, II, 413-414.

[87] Italics of the Constitution.

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> my principal object is, to qualify teachers for instructing the sons and daughters of farmers and mechanics, by lectures or otherwise, in the application of experimental chemistry, philosophy, and natural history, to agriculture, domestic economy, the arts and manufacturers.[88]

Such movements as these to provide secondary education of a more 'useful' kind were hailed by one contributor to the Literary Gazette as "undoubtedly one of the most valuable improvements in this age of improvement."[89] They are "truly suited to an age of steam boats and spinning jennies," he maintains, for they add

> something that is scientific to the elementary arts of reading, writing, and arithmetic, and they differ from colleges by teaching what is strictly practical and universally useful, in stead of that which is partially useful, obsolete, or merely ornamental.

That is to say,

> They teach the modern, instead of the dead languages, drawing instead of Latin verses, and Tull's Horsehoeing [sic.] Husbandry instead of Aristotle's logic.[90]

It is his opinion that

> the utility of schools affording this kind of instruction, is no longer a question with the citizens of Boston and many other places in the United States; and we trust that the day is not far distant when it will cease to be a question

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[88] AJE, II, 413-414. For the curriculum of the Gardiner Lyceum, see ibid., pp. 216-219; U.S. Lit. Gaz., II, 361-367.

[89] III (1826), 283.

[90] Ibid., pp. 281-283.

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any where.[91]

Among the nation's colleges, there were those already seeking to avoid such aspersions as that cast by the Gazette's contributor. In 1824 the Gazette had warned Harvard directly against the tendency to stagnate which was manifest at Oxford and Cambridge--had declared that "nothing of the sort, and nothing approaching it, should be suffered here"; that Harvard should aim "only to become what the spirit of the age demands."[92] But it had been over a half-dozen years earlier that Jacob Biglow, life-long opponent of the dominance of classical learning in education,[93] assumed the Rumford chair at Harvard[94]--a chair established for the purpose of teaching

> by regular courses of academical and public lectures, accompanied with proper experiments, the utility of the physical and mathematical sciences for the improvement of the useful arts, and for the extension of industry, prosperity, happi-

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[91] Ibid., pp. 283-284.

[92] I, 108. Cf. Substance of Two Reports of the Faculty of Amherst College, pp. 3-6.

[93] Cf. "Inaugural Address [as Rumford Professor]," N. Am. Rev., IV (1817), 271-281; An Address on the Limits of Education, Read before the Massachusetts Institute of Technology, November 16, 1865, Boston, 1865; Remarks on Classical and Utilitarian Studies, Read before the American Academy of Arts and Sciences, Dec. 20, 1866, Boston, 1867.

[94] Held this professorship from 1816 to 1827. Josiah Quincy, History of Harvard University (Boston, 1840), II, 231, 383.

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ness, and well being of society.[95]

And the 'improving spirit' continued to be felt at Harvard in the years that followed. It was responsible for George Ticknor's famous Remarks on Changes Lately Proposed or Adopted in Harvard University,[96] fundamentally a plea for an educational system more flexible and more suited to the practical needs of the community. For it was Ticknor's belief that there had "not yet been fully answered" by the nation's schools, the demands created by

> the great increase of manufacturing establishments, which all require men of peculiar skill and knowledge to manage them; the improvement in all the arts, which supposes a corresponding improvement in the education of those who are devoted to them.[97]

He assures his countrymen that

> the generation, on whom now rest the cares of life among us, feel very sensibly, how much more lightly their burthen could be borne, if they had more of that knowledge, which is, indeed, power everywhere, but nowhere so truly and entirely, as in the midst of free institutions.[98]

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[95] Quoted ibid., II, 320-321.

[96] A document which, according to H. B. Adams, "marks the dawn of a new era in American University education." Life and Writings of Jared Sparks (Boston and New York, 1893), I, 351.

[97] Op. cit., pp. 3, 35-36.

[98] Ibid., p. 3. Ticknor favored the departmental and elective systems. It should be added that at the same time Ticknor urged more adequate discipline in classical Languages. But this should not be considered prima facie evidence against

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To greater or less extent other colleges and universities were showing the effects of the Baconian temper. The sciences and their application were increasingly emphasized in the curriculum; the position of the 'dead languages' was attacked, in some instances successfully; adjustments were made to enable those destined for careers other than professional to enter the halls of higher learning.[99] The University of Virginia was a child of this reform movement--as well as of Thomas Jefferson. The Rockfish Gap Report (1818), the basis for the act establishing the University of Virginia,[100] after it took heed of the moral needs of man, noted prominently as the objects of higher education:

> to harmonize and promote the interests of agriculture, manufactures and commerce, and by well informed views of political economy to give a free scope to the public industry;

and further,

[Footnote 98 Contd.]

the possession of a Baconian cast of mind; for Ticknor had apparently brought home from Germany and was promulgating here the ideal of thorough and 'scientific method' in philological research (ibid., pp. 6-7). In any case, there remain the Baconian proposals explicitly affirmed.

[99]See Appendix VII on the college curriculum in transformation (p. xvii).

[100]Philip A. Bruce, History of the University of Virginia, 1819-1919 (New York, 1919), I, 235. The Report itself was said to have come from the pen of Jefferson. Analectic Magazine, XIII (1819), 104.

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> to enlighten our youth with mathematical and physical sciences which advance the arts and administer to the health, the subsistence and comforts of human life.[101]

Behind which pronouncement was a firm acceptance of the Promethean idea. "We should be far too from the discouraging persuasion," the report reads,

> that man is fixed, by the law of his nature, at a given point; that his improvement is a chimaera, and the hope delusive of rendering ourselves wiser, happier, or better than our forefathers were.... Education ... engrafts a new man on the native stock, and improves what in his nature was vicious and perverse, into qualities of virtue and social worth; and it cannot be, but that each generation, succeeding to the knowledge acquired by all those who preceded it, adding to it their own acquisitions and discoveries, and handing the mass down for successive and constant accumulation, must advance the knowledge and well-being of mankind, not infinitely, as some have said, but indefinitely, and to a term which no one can fix or foresee. Indeed, we need look back only half a century, to times which many now living remember well, and see the wonderful advances in the sciences and arts which have been made within that period. Some of these have rendered the elements themselves subservient to the purposes of man, have harnessed them to the yoke of his labours, and effected the great blessings of moderating his own, of accomplishing what was

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[101] "Proceedings and Report of the Commissioners for the University of Virginia," Analectic Magazine, XIII (1819), 108. However, the entrance requirements were to include a knowledge of Greek and Latin, which, it was expected, would be obtained in the primary and intermediate schools. Jefferson's love of the classics was not in conflict with his love of science. Ibid., pp. 111-112. The important thing to be noted here, in any case, is the strong influx of scientific and practical courses, not the retention of traditional requirements.

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> beyond his feeble force, and of extending the comforts of life to a much enlarged circle, to those who had before known its necessaries only.

Hence, the folly of depending on the past for wisdom in the guidance of life.

> What, but education, has advanced us beyond the conditions of our indigenous neighbors? and what chains them to their present state of barbarism and wretchedness, but a bigotted [sic] veneration for the supposed superlative wisdom of their fathers, and the preposterous idea that they are to look backward for better things and not forward longing as it should seem, to return to the days of eating acorns and roots, rather than indulge in the degeneracies of civilization?[102]

Others connected with college education were expressing similar sentiments. Harvard's Professor Farrar was pleased to learn of the founding of two new English universities "very different from the old" in their recognition of modern social needs and their provision, accordingly, for

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[102] Ibid., pp. 108-109. The political view with which the Promethean theme is here associated points to Jefferson's hand. The Report continues(p. 109):

> And how much more encouraging to the achievements of science and improvement, is this, than the desponding view that the condition of man cannot be ameliorated, that what has been, must ever be, and that to secure ourselves where we are, we must tread, with awful reverence, in the footsteps of our fathers. This doctrine is the genuine fruit of the alliance between church and state, the tenants of which, finding themselves but too well in their present position, oppose all advances which might unmask their usurpations, and monopolies of humours, wealth and power, and fear every change, as endangering the comforts they now hold.

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the study of the physical sciences.[103] And he censured the desire to maintain a tradition-bound educational system in a progressive world. "Heretofore," he argues,

> an education has been thought to consist chiefly in a knowledge of the past, in attainments that relate to what the world has been. This was very proper in an age just emerging from barbarism, and having no pretensions to a literature of its own. But the world is changed. Old things have passed away. All things have become new. Rude and unlettered tribes are transformed into enlightened and polished nations. Languages that served but little except to express the more essential wants of animal existence, have become the vehicles of important truths and elevated sentiments. New regions of thought have opened upon the inquisitive and active spirit of man. A new heavens [sic] and new earth are revealed to the eye of science. The planets revolve in other orbits, and by other and sublimer laws. The starry firmament, so long the object of idle gaze and stupid astonishment, is at length penetrated and explored. By an almost miraculous mechanism, the busy and restless intellect has transported itself into these trackless and boundless regions. The sphere of human observation has been enlarged in both directions. It has been made to comprehend the minute as well

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[103] "Natural Science," Christian Examiner, VII (1829), 261-263. In 1816 the North American Review honored the founding of the "College for London Institution" with the reprinting of some of the sentiments expressed at the laying of its foundation. III (1816), 157-162. The editor expressly chose those extracts which "apply to this country," among them this declaration that it was hoped the new institution "would bring Science and commerce into contact," so that together they might

> ascend the Heavens, ... delve the depths of the earth, and fill every climate that encourages them, with Industry, Energy, Wealth, Honour, and Happiness.

Ibid., pp. 161-162.

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> as the vast; new worlds and myriads of organized beings are brought to light, where, to the unassisted sense, there seemed no room for infinite intelligence to exert itself. In the arts also, by which all these magnificent discoveries are made known, illustrated, and diffused, and brought down to every man's comprehension and to every man's means, the achievements of modern times are no less wonderful.[104]

To the educator who had dedicated himself to promoting these "achievements of modern times," by assuming the Rumford professorship in 1816, it also seemed that man's progress had made technical education imperative. Dr. Bigelow's "Inaugural Address" was fundamentally an affirmation of the belief that mankind's ascent was the result of progressive power over physical nature.[105] And the Elements of Technology (1829), chiefly comprising the lectures delivered in fulfilling his duties as Rumford professor, was introduced to the public with a reiteration of the Promethean theme and the prophecy that education would heed it: Since "the application of philosophy to the arts may be said to have made the world what it is at the present day"--since "it has not only affected the physical, but has changed the moral and political condition of society"[106]--what knowledge can be more worth than knowledge of the arts?

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[104] Christian Examiner, VII, 261-262.

[105] N. Am. Rev., IV (1817), 271-281.

[106] Introduction, p. 4.

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> With their increasing consequence, there must also be an increasing attention to their study and dissemination. Curiosity keeps pace with the interest and magnitude of its objects. And unless the character of the present age is greatly mistaken, the time may be anticipated as near, when a knowledge of the elements and language of the arts will be as essentially requisite to a good education, as the existence of the same arts is to the present elevated condition of society.[107]

The adoption of Bigelow's Technology as a textbook was urged by Daniel Treadwell, the President of the Boston Mechanics' Institute (himself to assume the post of Rumford professor in 1834), who assured the readers of the Christian Examiner that

> if our recommendation can have any weight with the instructers of high schools and colleges, the Elements of Technology will soon become a text book in common use.

This event would be an occasion for 'rejoicing,' since

> it would meet the public desire that education should be governed more with a view to furnishing young men with a competent knowledge of the busy concerns of life, in which most of them are destined, in some way, to engage.[108]

And George B. Emerson, whom we have already noted as a friend to science and practical education,[109] also welcomed the Technology with asseverations about the need in education

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[107] Ibid., p. 5.

[108] VII (1830), 189.

[109] Cf. Robert C. Waterston, Memoir of George Barrell Emerson (Cambridge, 1884), especially pp. 7-10, 13-16.

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of the knowledge offered by such a work. It is shameful, he contended, that men with higher education should be ignorant of the machinery and the technical processes that have become so integral a part of civilized life.[110] And it is just such ignorance that, in his judgment, Bigelow's work will tend to correct. It may, in fact,

> offer the occasion, as it gives the means, of forming, in many places of education, a new department or a new study, as important undoubtedly, and capable of being rendered as attractive, as any study or department whatever.[111]

"The object of such a department," he explains,

> would be the application of the principles of philosophy to the arts and pursuits of man. And philosophy should be here understood in its most extensive sense, as comprehending, not only what has been fixed by the principles of science, but what has been discovered by experience and observation, or brought accidentally to light, in whatever concerns the external accommodation of the solitary or social man, facilitates his intercourse immediately or remotely with his species, gives him power over the elements and the productions of the earth, or enables him to extend his inquiries above or below him, and to penetrate into the hidden parts of the creation.[112]

He does not suggest that such a department replace any now existing, but that it

> should be superadded, as the key-stone of the

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[110] "Bigelow's Elements of Technology," N. Am. Rev., XXX (1830), 338-340.

[111] Ibid., p. 340.

[112] Ibid., pp. 340-341.

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> arch, to give completeness and solidity to the fabric of education.[113]

And he envisions every place of education equipped with models of steam engines and other machines, as well as collections of "substances and instruments" useful in chemistry and natural philosophy.[114]

It was this selfsame zeal in the cause of scientific and technological education that led George Emerson to labor for the establishment of the Boston Mechanics' Institution, which was sent upon its career with that reverend gentleman's assurance that it signalized "a new era in the history of science and the mechanic arts."[115] It inspired him with a vision of

> thousands ... listening to the lessons of philosophy, which come home to their own 'business and bosoms';

and

> the gates of the temple of science, closed as with adamant, since the beginning of time, against all but a favored few ... thrown wide open, and multitudes from the workshops and fields, from the mine, the forest, and the ocean, from every region of labor and action, ... hastening up thither to partake and rejoice in the waters of intellectual life.[116]

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[113] Ibid., p. 341.

[114] Ibid., p. 356.

[115] Address at the Opening of the Boston Mechanics' Institution, p. 1.

[116] Ibid., p. 15.

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Such evidence of the close association of educational reform with zeal for scientific and technical training as a guarantee of progress could be extended indefinitely. Early in the century Joseph Lancaster came to America to lecture and to open a monitorial school in Baltimore[117]-- and promptly to suggest delectable social prospects for this nation if every college were equipped with a museum of "natural and experimental philosophy."[118] The Reverend Alonzo Potter of Union College who maintained that the state of a society is directly proportional to the moral and intellectual condition of its "mechanics and operatives,"[119] but who also believed that every man, whatever his calling or position, should possess a knowledge of science and the useful arts,[120] justified this belief with the argument that "systematic instruction in the theory and economy of the useful arts" is "necessary on the simple principle that knowledge is power."[121] The inaugural address (1838) of the new professor of mathematics and natural philosophy in New York's Western Reserve

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[118] Ibid., pp. 54-57.

[119] Address Before Mechanics' Society of Poughkeepsie, pp. 6, 11-12, 17-23.

[120] Principles of Science, pp. 15-18.

[121] Ibid., pp. 397-398.

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College was principally an argument for the indispensability in modern society of scientific education.[122] Walter Johnson persistently urged popular and Baconian education as the principal means of promoting social progress; and though he would not have excluded classical learning from the schools,[123] and would have placed the study of man's 'character, duties and destinies' before the study of physical science and its application,[124] he nevertheless saw technical learning as the foundation of civilized life (and that included, specifically, moral elevation)--as that which, in the interests of progress, had to be encouraged and expanded through appropriate education.[125] "To be destitute," he argued,

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[122] Elias Loomis, An Inaugural Address, Delivered August 21, 1838 (New York, 1838), pp. 3-4, 6-19, 34. Professor Loomis would have had "every American citizen ... a [natural] philosopher." Ibid., p. 3.

[123] "On the Combination, etc.," Journal of the Franklin Institute, II (1828), 166-168. It was Johnson's opinion that a 'liberal' and a 'practical' education could be satisfactorily combined; that a man destined for business need not give up classical languages for a technical course, but might find time for both.

[124] "Mechanics and Natural Philosophy," AJE, IV (1829), 24.

[125] Ibid., pp. 24-28; "On Schools of the Arts," American Institute Lectures, pp. 271-291. Note also that he was opposed to what he called "merely ornamental" education, which he identified with aristocracy and a generally backward state of society. He saw such education as characteristic of feudal times, marked by restriction of wealth and political power, as well as of education, to a few. "On the Combination, etc.," op. cit., pp. 56-57. The purpose of the Franklin Institute High School, of which Johnson became

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> of the science and skill which are necessary to the prosecution of mechanic arts, is certainly one of the characteristics of a state of barbarism.[126]

And there was William Seward who, while governor of New York, never missed an opportunity to remind the state legislature of the importance of internal improvements.[127] He also believed it to be necessary on at least one occasion to complain that "our academies and colleges" were giving "superficial instruction in the dead languages" and not "the philosophy of our own."[128] Both as Whig and as philosopher he could reason the interdependence of internal improvements and human elevation morally and intellectually. He was convinced that

> there can be no improvement of the physical condition of a country which will not stimulate all the motives to moral and intellectual improvement of the people.[129]

[Footnote 125, Contd.]

principal, was to provide an education which would aid in "the diffusion of useful knowledge, and the advancement of the mechanic arts." Ibid., pp. 109-110.

[126] "Mechanics and Natural Philosophy," AJE, IV, p. 24.

[127] Works, II, 198-206, 228-254, 281-287, 309-320, 334-336; III, 128-134. The cause of internal improvements was, of course, related to the cause of an education oriented to social need. Cf. "Board of Public Works in Virginia," N. Am. Rev., VIII (1818), 1-26.

[128] Works, II, 207.

[129] Works, II, 205, 212.

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And he was equally convinced of the soundness of the "general principle" that "knowledge is power," "however repugnant we may be to admit its truth, and however glaring may be the exceptions to it."[130] Accordingly, he wished to see 'useful learning' diffused; for it meant the extension of power and enlightenment.[131]

> Let us then remember for ourselves, and inculcate upon the people, that our progress thus far has but led us to the vestibule of knowledge ... let us instruct them that there is a science that will reveal to them the hidden and perpetual fires in which are continually carried on the formation and modification of the rocks which compose this apparently solid globe, and from whose elaborate changes is derived the sustenance of all that variety of vegetable life with which it is clothed: that another will disclose to them the elements and properties of those metals which men combine or shape with varied art into the thousand implements and machines by the use of which the forest-world has been converted into a family of kindred nations; that another solicits their attention to ... all the races of animated beings, and learn their organization, uses, and history; that another will classify and submit to their delighted examination the entire vegetable kingdom ...; that another will decompose and submit to their examination the water which fertilizes the earth, and the invisible air they breathe; will develop the sources and laws of ... heat ... and lightning.

"Let us," he urges further,

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[130] Works, III, 148.

[131] Works, III, 142, 164-175. He saw the common man become the aristocrat of the earth through the knowledge which is power (III, 146-148). His Baconian bias is particularly emphatic in an address delivered at Albany in 1842, in which he urged provision for agricultural education. Works, III, 171.

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> teach that the world of matter in which we live, in all its vast variety of form, is influential in the production, support, and happiness of our own life, and that it is passing strange, that with minds endowed with a capacity to study that influence and measurably direct it, we yield uninquiringly to its action, as if it were controlled by capricious accident or blind destiny. Shall we not excite some interest, when we appeal to the people to learn that science which teaches the mechanism of our own wonderfully and fearfully fashioned frames, and that other science which teaches the vastly more complicated and delicate structure of our immortal minds? Who would not follow with delight that science which elevates our thoughts to the heavens, and teaches us the magnitude, forms, distances, revolutions, and laws of the globes that fill concave space above us?

And thence from nature we may ascend to nature's God:

> And who, with thoughts thus gradually conducted through the range of the material universe, would not receive with humility, yet with delight, the teachings of that spirit of divine truth which exalts us to the study of the character and attributes of that glorious and beneficent Being, whose single volition called it all into existence?[132]

So piety and power again combined for the greater glory of Baconianism. However, in my next section it will be seen that the Promethean and the handmaid-to-piety arguments were not the only ones at the disposal of the earnest Baconian.

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[132] Works, III, 144-145.

Although the entire circle of tha arts and sciences, including "eloquence, poetry, and music," is swept into this vision of the complete education (ibid., p. 145), Seward is unquestionably convinced that fundamental to the development of civilization and a truly democratic society (ibid., pp. 146-148) is the diffusion of that knowledge which is power in the Baconian sense.

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CHAPTER II

Nature, the Great Instructress

As we have seen, the argument for educational revision drew upon the Baconian credo that the cause of science is the cause of progress, and principally through the material power yielded mankind. But the Baconian faith in the value of science in education was strengthened by still other postulates. That science meant empire over nature was, certainly, a most important consideration; and it seemed also sufficiently important to be guided by the realization that science can be the source of political and religious as well as of physical truth. However there was the further consideration--the pedagogic consideration--that science, as a study, conduced directly to the intellectual and moral improvement of the individual. In short, science was seen working its benign way in the world by operating upon the mind and heart of those who pursued it, as well as by returning material and, thence indirectly, spiritual blessings upon the society that applied it. Whichever the handle grasped, social elevation seemed the ultimate promise. "What immense advantages might not be derived for our country, nay, for the world, from a million of schoolboys,spread all over the land,

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each with geologist's hammer in hand." So wrote the author of the American Institute of Instruction's prize essay "on a system of Education best adapted to the Common Schools of our country."[1]

Arguments for the direct mental and moral value of scientific studies appeared with unflagging persistence during this period. They were carried in the forewords of textbooks; they were offered regularly to readers of periodicals; they frequently became the theme of oration and lecture. Science was refreshing--stimulating. Such pursuits as botany and mineralogy drew one into the open air, exercised and strengthened the physical man as they fed the mind with sound learning. And as the intellect was disciplined to truth by exacting research, and expanded by concepts of the vastness and intricacy of nature, so the heart also responded: the benign influence of nature softened and tranquillized and ennobled; and as its supreme blessing, in manifesting the hand of the Creator, it led us 'to the Throne itself of God.'[2] With "so many advantages with re-

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[1]Thomas H. Palmer, The Teacher's Manual: Being an Exposition of an Efficient System of Education, Suited to the Wants of a Free People (Boston, 1840), p. 184. This essay won a five-hundred dollar prize offered by the Institute in 1838. A motto from Carlyle adorns the title-page! Palmer also would include physiology in the curriculum, along with geology, mineralogy and botany. These studies 'would absorb the children's attention and keep them from vice.' Ibid., pp. 183-184.

[2]See Appendix VIII, p. xxi.

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spect to health, tranquility of mind, useful knowledge," not to mention "inexhaustible amusement," being "united in the study of nature," it is not to be wondered that one contributor to the American Journal of Education should be eager to have parents realize that "a principal attention should be given [the study of nature] in the education of every person," and that every child should be provided with such works as the Rationale Dame.[3] The sciences, so the New York Mirror informed its readers, "are the guide of our youth, the perfection of our reason, and the foundation of every great and noble undertaking."[4]

Similar opinions of the educational value of science came from quarters less susceptible, perhaps, to the journalistic superlative--but no less confident. The intellectual benefits argued are quite familiar in our Baconian world. There were, principally, the contentions that a scientifically trained mind is one disciplined in habits of observation, patience, orderliness-- as well as one strengthened and guarded by the correct procedure in reasoning to conclusions from carefully ascertained facts. Scientific study, the author of a Juvenile Philosopher assured parents, "exer-

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[3] AJE, II (1827), 396-397. A following section (pp. 401-102) deals briefly with methods of teaching children such practical subjects as mechanics and applied chemistry.

[4] V (1827), 14.

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cises and consequently improves the rational powers of man."[5] And an American edition of Bakewell's Philosophical Conversations promised that by application to natural philosophy the young "will learn to think, and will acquire the habit of investigating the causes of things."[6] In the opinion of an earnest contributor to the American Journal of Education,

> The new and increased strength and vigor and independence of mind, which are beginning to be manifested by all classes, are to be attributed to the impetus received from the principles of a sound natural philosophy.

In pursuing this study, he holds, the mind is 'in its element,' is functioning in accord with its proper nature; hence the wholesome result.

> Natural science is the world in which the mind loves to labour; and the tendency and effect upon itself, are similar to the effects which the body derives from free exercise in the open air.[7]

The authority of Lord Brougham also was available to support the idea that a salutary effect upon the intellect- a sort of cleansing, bracing, emancipating effect - comes

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[5] The Juvenile Philosopher; or Youth's Manual of Philosophy (2d revised edition, [Geneva N.Y.], 1826), pp. 15-16.

[6] Edited by Ebenezer Bailey (Boston, 1836), p. 5. Bailey was principal of the Boston Young Ladies' High School. His first edition of this work was issued in 1833.

[7] "The Philosophy of Bacon, Considered in Reference to Its Influence upon the Human Mind," IV (1829), 7.

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automatically with application to science. "The study of Bacon's philosophical works in general," he argues,

> and especially the Novum Organon, cannot fail to be highly beneficial to all persons who are entering on scientific pursuits, and to all who are engaged in inquiries after truth of whatever kind. Their general tendency will be, if we do not greatly err, to inspire a habit of close and patient thinking,--an intellectual independence, which resists all that is merely of the nature of hypothesis, while it bows with implicit deference to the authority of fact and experience. ... The spirit of the inductive philosophy is in perfect unison with man's intellectual nature; it offers a true corroborative to his faculties in his pursuit of truth; and the more completely this spirit is imbibed, the more shall we be guarded from the extremes of credulity on the one hand, and incredulity on the other.[8]

To one writer in the North American "the physical sciences must always help in extending and improving the mental energies of the people."[9] In the same periodical, Jared Sparks wrote of the "tone" acquired by "a mind trained to the accurate observation of nature."[10] And Walter Johnson, suggesting the apotheosis of scientist and technician, claimed that they must possess

> a mind disciplined and accustomed to dwell intently on the object of its search; a habit of observing with minuteness the incidental, no less than the general phenomena of things; a patience and calmness in watching the progress

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[8]"Bacon's Novum Organon, in American Library of Useful Knowledge, IV, 63.

[9]XXIII (1826), 350.

[10]XXIV (1827), 113.

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of one's own labors;

and withal,

> a mind fair and free from the trammels of hypothetical despotism,--ready to follow truth wherever she may lead, and willing to be instructed by facts, however contrary to the dogmas and theories of closet philosophy.[11]

This for the benefit of the American Institute of Instruction, which, the year before (1834) had listened to Dr. Charles T. Jackson of Boston laud the study of chemistry precisely because "it requires close attention, and teaches the mind to analyze the phenomena on which it reasons"--because it "becomes a sort of tangible logic," its results being "corrected and checked by numerous experiments which shut out all chance of error." Indeed, Dr. Jackson feels that

> this study has so much value in every point of view that it were well to have it inscribed upon every college and high school in the country, and the principle fully enforced, 'Let no one leave these walls until he has learned Chemistry.'[12]

Because of this belief in the salutary influence of scientific and technological study, mechanics' institutes were expected to prove themselves exceedingly effective

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[11] "On Schools of the Arts," American Institute of Instruction Lectures, 1835, pp. 289-290.

[12] "On the History and Uses of Chemistry," American Institute of Instruction Lectures, 1834, pp. 223-224. Dr. Jackson was curator of the Boston Society of Natural History, 1833-1841; second vice-president, 1841-1843; first vice-president, 1843-1874. The Boston Society of Natural History, 1830-1930, Printed for the Society (Boston, 1930), p. 47.

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instruments of moral and intellectual improvement. Let but "the light of science," declared George Emerson at the opening of the Boston Mechanics' Institution--let but this light fall upon the laboring man who once knew and cared only for his animal wants; let but " a few principles of philosophy enter his mind and awaken the dormant power of thought":

> He begins to look upon his art with an altered eye. It ceases to be a dark mechanical process, which he cannot understand; he regards it as an object of inquiry, and begins to penetrate the reasons and acquire a new mastery over his own instruments.... He gains new knowledge and new skill, and can improve the quality of his manufacture, while he shortens the process and diminishes his own labour. Then labour becomes sweet to him; it is accompanied by the consciousness of increasing power; it is leading him forward to a higher place among his fellow men.[13]

His hours of leisure he devotes to further study of technical problems--in a home blessed with charm, peace, and domestic sympathy. And "thus his mind and heart expand together."[14]

Others swept all the anticipated benefits of scientific study into a general paean. "The love of science," proclaimed Timothy Ford of South Carolina,

> is the love of truth; its culture is not only the sport and amusement, but the high repast of the understanding--by which it is refreshed and invigorated, and made to expand with accumulated strength. The mind feels the sublime

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[13] Boston Mechanics' Institution Address, p. 12.

[14] Ibid., pp. 12-13.

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> consciousness of its capacities being enlarged, and of their containing the rudiments of a state of the highest intellectual felicity, to which it is sensible of continued approximations in its scientific career.... These are the principles that have sublimated the minds of the great luminaries of science--that have carried them through the sleepless labours of the midnight hour, and drawn from them confessions 'of such having been the happiest hours of their lives.'[15]

It is not, he continued that science gives empire over physical nature that alone makes its pursuit so extremely valuable; for also by its means the mind may be coaxed into transcendence of the mundane:[16]

> it feels the necessity, and it embraces the occasions, of ascending to the first cause of all; whose existence, whose boundless power, wisdom, and beneficence are manifested by evidences, multiplied and decisive, in the discoveries of science.[17]

Thus, too, George Combe:

> Knowledge has been truly said by Bacon to be power; and with equal, at least, if not greater truth, it may be asserted, that, when pursued with reference to the God of all nature, it is virtue.[18]

"If such is the fact," asks one writer in the American

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[15] Op. cit., pp. 20-21.

[16] These were times when even a textbook in geology could mention the "enrapturing pursuit" offered anyone who "feels an interest in the works of creative intelligence." Amos Eaton, Geological Text-book, Prepared for Popular Lectures on North American Geology; with Application to Agriculture and the Arts (Albany, 1830), p. 11.

[17] Ibid., p. 25.

[18] Lectures on Popular Education, p. 61.

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Annals of Education,

> are not the subjects of natural history and of the natural sciences generally, too much neglected in our common courses of instruction?

"Would they not," he asks,

> quicken, invigorate, and develop juvenile, as well as infantile intellect? Might they not be applied to the elevation of the moral being of children? Might they not, through them, be led to contemplate, with a kind of awful, but salutary and animating solemnity, the Being who made them, and placed them in the midst of so much that is beautiful, and grand and designed for their use? Would not a knowledge of the works, the properties, and the laws of created objects, be calculated to make better farmers, better mechanics, better merchants, better teachers, better citizens, better men, and better women?[19]

For it is an "interesting fact," that this same knowledge which is "most applicable to the common practical pursuits of life," is also "best fitted for intellectual and moral development."[20]

Surely, knowledge exerting this influence is knowledge to embrace. Certainly, that nature which is its source can be neither hostile to man nor sullying to his spirit, but actually a means to the fulfillment of his higher powers. So thought the Reverend John Pierpont, that pious Baconian who could pen with equal gusto verses denouncing 'demon

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[19]"Popular Education," I (1830), 116-117.

[20]Ibid., p. 116.

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rum' or extolling Gaspar Spurzheim,[21] and who in 1832 held forth "on the moral influences of physical sciences" before the American Institute of Instruction.[22] According to Pierpont these moral influences of the "pursuit and attainment" of science are effected in various ways. By affording pleasure, the process of acquiring scientific knowledge leads us to be grateful and trustful towards the Creator: certainly a moral state of mind.[23] Moreover, it draws us away from idleness and corrupting associations--those insidious sources of vice.[24]The superiority of the sciences to literature in respect to moral influence he is bound to declare (although himself a humble suitor at the feet of the muse). How many literary figures have been stained by vice!

> But you may carry your eye down a long list of those who have shed a lustre on their country and their age, by their attainments in physical science, before you find one whose name has been dragged down by vice from the holy heights to which science has raised it. If this is a fact,--and an appeal to the lives of literary men, and a comparison of them with the lives of those who have most successfully prosecuted their researches

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[21] Airs of Palestine, and Other Poems (Boston and London, 1840), pp. 179-212, 216-218. Pierpont himself was an enthusiastic advocate of phrenology. Dictionary of American Biography, XIV, 586.

[22] American Institute of Instruction Lectures, 1832, pp. 89-198.

[23] Ibid., pp. 94-95.

[24] Ibid., p. 96.

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> into the mysteries of physical nature, will show whether it is a fact,--how loud is the testimony which experience gives in favor of the moral influence of physical studies! Indeed, I scarcely know an instance--can any one present name the instance--of a good naturalist, who at the same time was a bad man?[25]

This is inescapable, he explains, from the very nature of physical science in contrast with that of literature. For the one eschews passion and offers demonstrable truth--even of God; whereas the other makes capital merely of passion and of human frailty.[26]

It is particularly in its power to lead us from nature to nature's God that the superiority of science as a moral force becomes apparent for Pierpont--as for his contemporaries generally. Correct ideas of His works and His ways, Pierpont holds, are derivable from the study of His creation. Not that Revelation need be set aside. (The Baconian and Hebraic did not yet have to be discomfited in their wedded state!)

> But all revealed religion must rest upon the foundation of natural religion; and all books containing the records and the evidences of a revelation, need some external test or standard, confessedly proceeding from the hand of God, to which they may be brought for comparison and proof.... [27]

It is a mistake to apprehend that physical science will lead

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[25] Ibid., p. 97.

[26] Ibid., pp. 97-99.

[27] Ibid., pp. 101-103.

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to skepticism. There is, he insists, no conflict between science, concerning physical truth, and the Bible, concerning moral truth; Moses and the prophets are supplemented by the scientists.[28]

> In my mind, it derogates nothing from the veneration in which we hold 'Moses and the prophets,' as moral teachers and lights of the world, to consider that they knew nothing of the Western continent, of the size and distance of the Sun, of the satellites of Jupiter, the ring of Saturn, or the precession of the equinoxes, or yet of the consecutive geological formations which have been discovered since their day. These are things which God has revealed by other servants of his, whom he has raised up, and endued with the spirit of observation, and patient scrutiny, and with the power of ingeniously combining the facts gathered by their researches; men who observed the mysterious power of the magnet, that should guide the ship, the refracting power of crystals that might compose a telescope or microscope; men whom, at the same time, he inspired with a divine love of truth, and an equally divine disregard of the storms of the ocean, and of the still more dangerous storms of the human passions, blinded by ignorance, and roused to dreadful violence by religious bigotry, moved in turn by its own miserable fears--the fear lest some new truth should overthrow some old one, and the fear that the God of truth would not hold up it and its friends against the most violent opposition of human opinion and human authority.[29]

And so, in closing, the Reverend Pierpont again reminds his audience that when one turns to nature one holds "communion with the Infinite and Invisible Spirit who is presiding over

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[28] Ibid., pp. 103-106.

[29] Ibid., p. 105.

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all, and living in all, and moving through all."

> He, on the other hand, who does not commune with God's works, ... cannot and will not long hold true communion with God himself. He who shuts his eyes upon God's creation, and will not see in it the God which it reveals to him, will soon worship a God which his own gloomy imagination has formed.... But he who joyfully and reverently studies the works of God, has always in his hand a key, with which he can unlock the treasures of the sacred oracles, a volume, which, without a knowledge of physical science, is often a sealed book; and with which he can, moreover, unlock the sanctuaries in which the Creator holds audience with his creatures, and gain admittance to the real presence of the HOLY ONE.[30]

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[30] Ibid., p. 108. Cf. Paley, Natural Theology: or, Evidences of the Existence and attributes of the Deity, Collected from the Appearances of Nature (Boston, 1831), Conclusion, p. 295; Brougham, A Discourse of Natural Theology, Pt. II, sec. iii.

Inspired by this same spirit, Pierpont wrote for the dedication of the Dorchester Lyceum Hall in 1840:

> Temple of Science! through thy door,
> Now first thrown open, do we throng,
> And reverently stand before
> Creation's God, with prayer and song.
>
> Father of lights! thou gav'st us eyes
> Earth, ocean, sun, and stars to see,
> And thee in all;--they roll or rise
> To teach us of thy majesty.
>
> Works of his hand! where'er ye lie,
> In earth or beaven, in light or shade,
> These walls shall to your voice reply;
> Here shall your wonders be displayed.

And he calls upon all the elements and planets to "teach us, O teach us, in this hall."

Airs of Palestine, pp. 151-152.

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The most prevalent argument, of course, and that in which the praises of science generally culminated, was this last--that the study of nature reinforced religion: that by affording "new and striking traces of the wisdom and benevolence of the Deity" (to quote New York's Chancellor Kent), it made God's presence an undeniable actuality.[31] On this basis one speaker before the American Institute urged even ministers of the Gospel to encourage an interest in physical science.[32] And the Portland Magazine proffered the idea that

> it is impossible for us to understand the most simple object of nature, without seeing and feeling that in it are motives of love to our heavenly Father, worthy to influence us to adoration and obedience.[33]

Levi Woodbury felt, indeed, that when the sparks from the fur of the cat, and the lightning which splits the knotted oak, are found, by philosophy, to be the same," it provides the sort of lesson in the harmony of nature which conducts "our thoughts from nature up to nature's God."

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[31] Memoirs and Letters of James Kent, LL.D., Late Chancellor of the State of New York (Boston, 1898), pp. 246-247. This warm friend of classical learning expressed to Professor Silliman, at the same time, his regret at having neglected scientific study.

[32] John L. Russell, "On the Study of Natural History," American Institute of Instruction Lectures, 1837, pp. 71-89.

[33] I (1835), 284.

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> Whence he concluded that the mechanic, above all others, with a mind stored from observation and science, cannot but soon incline, and accordingly elevate his views, to the great Architect of all things.[34]

"The first and greatest commandment," wrote another,

> is inforced by every lesson in the sciences; the seal of wisdom and benevolence is on
>
> 'Every star the sky doth shew,
> And every herb that sips the dew:'
>
> And the farther we penetrate into the temple of nature, the nearer we approach the Holy of Holies.[25]

The study of nature was seldom recommended without either specific reference to, or an echo of, Paley or Brougham or the Bridgewater Treatises.[36] Manifestly, the principles of natural theology were being deeply ingrained in the early nineteenth-century mind--which is not surprising in view of the general acceptance of natural theology as an important part of the course of study in schools of all grades.[37] That "the undevout astronomer is mad" attained almost the status of an article of faith.

Now in the handmaid-to-piety argument we discover, even

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[34] Writings, pp. 22-23.

[35] U.S. Rev. and Lit. Gaz., I (1826), 134.

[36] Vid. Appendix VIII, p. xxi.

[37] Cf. "My Books," New Eng. Mag., IV (1833), 454-459; being the writer's schoolroom experience with Paley and the watch.

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as in naturalism, both rationalistic and sentimental elements; that is, natural theology too reflected the duality of 'hard'and 'soft' temperament so frequently present in the same Baconian: faith in science as the source of truth paradoxically concurrent with susceptibility to vague and tender emotional appeal. Thus, for instance, Paley, when arguing the existence and attributes of Deity from 'design,' addressed himself to the reason. He expected his readers to be convinced rationally; his method was logical. Likewise Brougham, who related the same ideological pattern with scientific method--who ventured to show that natural theology "is a science, the truths of which are discovered by induction"[38]--asked his readers to be convinced by strict reasoning. He offered his work in natural theology expressly as "a Logical one."[39] On the other hand we find in Paley that reason can defer to sensibility; for example, in that famous twenty-sixth chapter which suddenly opens to our view the earth teeming "with delighted existence." from "insect youth" testifying "their joy" and "exultation" in "sportive notions" and "gratuitous activity" to all the animal kingdom, including 'schools of the frolicsome fry of fish,' who are "so happy that they do not know what to do with

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[38] Discourse of Natural Theology, p. 7.

[39] Loc.cit. Italics Brougham's.

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themselves."[40] Thus was God's beneficence manifest, and he who contemplated could but admire. I do not mean to imply that the emotional and imaginative content of religious experience was connected illicitly with natural theology; but only that, as Paley or others of Baconian temperament viewed this experience, its intellectual, emotional, and imaginative factors were not harmoniously integrated, nor adequately appraised. As a consequence we frequently find either a promiscuous mingling of all these elements, or, on the one hand, the inductive process of reasoning the Baconian Divine Way, and on the other, obscure emotionalism offered as the equivalent of a full religious experience. In either case, however, natural phenomena became the source of religious inspiration; nature worked beneficently upon the heart and mind. That, indeed, is the important consideration here, together with those manifestations of sentimentalism, associated with a naturalistic tendency, which round out our composite picture of the Baconian mind.

To numerous cultivated Americans of the early nineteenth century who stressed the religious value of nature study, its influence was not alone a matter of intellectual apprehension, but also of inspiration (though an inspiration frequently based upon that apprehension). The consciousness of beneficence

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[40] Natural Theology, pp. 253-254.

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operating in nature and the mood of wonder were correspondent. Together they wrought upon the feelings and inspired to greater piety. So Stephen Elliott before the South Carolina Literary and Philosophical Society:

> In the examination of natural substances, you meet with every beauty that arises from colour, every delight that springs from fragrance, every grace that depends on form, mingled with that pleasure, which is derived from the contemplation of endless, inexhaustible variety. If to the eye of taste, the lawn, the grove, the stream, the mountain, the ocean, the inanimate bosom of nature, afford unsated pleasure, what must be the increase, when science gives to every object that surrounds you, intelligence and life.--When the very earth, on which you tread becomes animate, when every rock, every plant, every insect presents to your view an organization so wonderful, so varied, so complex; an adaptation of means to ends, so simple, so diversified, so extensive, so perfect, that the wisdom of man shrinks abashed at the comparison.

Through everything runs a "harmony" which compels admiration.

> We find every where life, intelligence and order. We feel ourselves surrounded by monuments of immeasurable power, of incomprehensible wisdom, of illimitable goodness. We survey and examine them, until knowledge is lost in astonishment, until wonder yields to adoration. We exclaim with the psalmist 'Great and wonderful are thy works Lord God Almighty, in wisdom hast thou made them all.'[41]

The inspirational power of nature was also proclaimed by the Reverend Follen. From the pulpit he at one time earnestly argued that "the simple and sublime truth" of the words:

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[41]"Address to the Literary and Philosophical Society of South Carolina," reprinted in Analectic Magazine, VIII (1816), 162-163.

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"in Him we live, and move, and have our being," seem to come

> home to us more readily and fully, when, surrounded by the living works of nature, we are breathing the free air of the country, than amid the dead productions of human industry, when our steps, our looks, and our very thoughts are shut up within the narrow walls of a crowded city.

For,

> in the wild woods, amidst trees, and shrubs, and plants of every shape and color, we feel as if the same power, that animates and expands so many unknown germs into an infinite variety of forms of vegetables and animal life, was quickening, enlarging, and invigorating every faculty of our own material and spiritual being. We feel and we are convinced, that this endless variety of form and color, sound and motion... is ... pervaded and controlled by the omnipresent Spirit of harmony, which moves the inmost chords of our own nature.[42]

Henry Ware links science and poetry in a spiritual sisterhood, their inspirational power being ascribed to the same source. "Science and Poetry," he explains,

> recognizing as they do, the order and the beauty of the universe, are able handmaids of Devotion. They have been, they may be, drawn away from her altar. But in their natural characters they are coöperators, of the great creating Power; Poetry unveils the smile of the All-sustaining Love. Science adores as a subject; Poetry worships as a child. One teaches the law, and the other binds the soul to it in bands of beauty and love. They turn the universe into a temple, earth into an altar, the

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[42] Works, II, 233.

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> systems into fellow-worshippers, and eternity into one long day of contemplation and praise.[43]

"It seems to us," wrote a contributor to the Christian Examiner in 1829,

> ... and by itself considered, a grievous wrong to the human mind, that it should pass through a world like this, in such ignorance as generally prevails, of all the wonders it contains. It is a wrong, if we might so,to the Creator.

"Miracles of his power and wisdom" surround us; philosophers disclose to us "worlds within worlds":

> And yet the mass of mankind pass through this magnificent theatre, richer than all that human imagination could devise and human art frame, as ignorant of its interior structure and symmetry, and the skill of its Architect, as if they had lived upon a barren mountain, or in a subterranean mine.[44]

The Portland Magazine provided an echo of Paley in a passage of admiration for a universe teeming with life and sounds

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[43] Works, I, 137-138. For Ware, "a steam-engine, a carding machine, a spinning jenny for cotton, a gypsy for hemp, a watch"--all are "full of poetical pleasure to the thoughtful, as of utility to the active." And "the sagacity of Newton is strangely like that of inspiration." Ibid., pp. 125, 129.

[44] "Diffusion of Useful Knowledge," VI (1829), pp. 81-82. It is because he anticipated that the inclination to study nature, upon which this great awareness depends, could be promoted by them, that he "hailed the establishment of the mechanics' associations of England" and looked with "hope and interest" to the Lyceum. Ibid., p. 82. (I have seldom found the practical Baconian very far behind the sentimental pietist in this material. The same writer, in fact, anticipates the development of "manly self-respect" as well as useful pursuits as a result of the Lyceum. Ibid., pp. 84-85.)

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and sights, even beyond our powers to apprehend. "And when," we read,

> in this almost prodigal waste of life, we perceive, that every being, from the puny insect which flutters in the evening ray, from the linchen [sic] which the eye can scarcely distinguish on the mouldering rock, ... that every living form possesses a structure as perfect in its sphere, an organization sometimes as complex, always as truly and completely adapted to its purposes and modes of existence, as that of the most perfect animal; when we discover them all, to be governed by laws as definite, as immutable as those which regulate the planetary movements, great must be our admiration of the wisdom which has arranged, and the power which has perfected this stupenduous fabric.[45]

And Orville Dewey similarly assumed an intellectual foundation in natural science to be a prerequisite for that wonder and joy in the contemplation of nature which stimulates piety.[46] "To stand amidst the works of the wonderful Architect," he writes,

> as their admiring interpreter; to look around, not with the dull, unconscious gaze of mere animal sensations, but to comprehend, in their qualities and uses, the things that we behold, the air, the sunshine, the storm, the lightning; to see all things rising in their order, and moving in their harmony; stand, as did the first man, and 'call by their names' all things that 'pass before us,' is to take one of the noblest and happiest positions on earth; and fittest, too, for the lord of this lower creation.[47]

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[45] I (1834), 92.

[46] "Diffusion of Knowledge," N. Am. Rev., XXX (1830), 311-313.

[47] Ibid., p. 307.

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But if, in addition, nature were not meant to be contemplated for the aesthetic and religious experience to be derived, would plants have been given "their present curious structure and beautiful appearance"?[48] Thus also Follen, in the sermon from which we have just quoted, spoke of "the strong impressions made on our minds by what is sublime and beautiful in natural scenery," and of how these "impressions raise our thoughts and our desires beyond the narrow interests of the day, and the anxious cares for the morrow," and

> prompt us to look, and to set our affections,
> not on the things that are seen and temporal,
> but on those that are not seen and eternal.[49]

For Dr. Augustus Gould of Boston, the noted conchologist, as for Dewey and Follen, there is beyond the intellectual and practical values of nature study the intrinsic value of experiencing "the inherent beauty" and wonder of "all nature's works."[50] But moreover, in themselves, phenomena become worthy of contemplation: "Everything," Dr. Gould told the American Institute in 1834--

> everything formed by the hand of the all-wise
> Creator is worthy our consideration, and we

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[48] Ibid., p. 298.

[49] Works, II, 234.

[50] "On the Introduction of Natural History as a Study to Common Schools," American Institute of Instruction Lectures, 1834, pp. 230-231.

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Here we have, of course, manifestations of what is generally regarded as a mark of the modern mind: even without reference to use, a strong interest in natural phenomena. What seems almost a cult of the wonder of nature is apprehended in such sentiments as these. They indicate that the phenomena of nature could assume (and moreover, in the minds of 'hard' Baconians) a significance far removed from any utilitarian objective. True the attitude of wonder is in this period generally associated intimately with Christian tenets, and often with a rational groundwork in scientific investigation. Supported by theological interest, nature's appeal to the heart could obtain the supreme sanction of duty without losing any of the force of sentiment. But neither of these factors--rational and theological--were inevitable, nor were they always present in expressions of the 'Psalmist's mood.' Nature was vouchsafed the power to awe man into piety without any previous scientific demonstration of design and harmony; and the 'heart might leap up,' without the accompaniment of Christian thoughts. In short, it was possible to conceive of a vague emotional rapport between man and nature. It could be just 'good' to contemplate nature--to drink in her activity and her moods: to feel emanating directly from natural surroundings a benign, purifying and ennobling influence

Whose dwelling is the light of setting suns,

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> may derive from the contemplation of each object, something to excite our wonder.[51]

"We inhibit a wonderful and most interesting world," exclaimed one of Pennsylvania's educators.[52]

> Who can look abroad upon this vast globe of earth and rocks and water and air--of hills and vallies [sic]--of trees and vegetables, and fruits and flowers,--of summer and winter, and day and night--of men and animals--and of life and death, without emotions of admiration and astonishment? It is indeed a wonderful world. Every thing about it, and upon it, is wonderful. There is not an object upon its face, animate or inanimate, which might not afford a theme of unceasing wonder to the loftiest mind in creation.[53]

Natural phenomena should excite wonder in us all. Surely it is

> interesting to see sparks of fire, or something like it, darting from our own bodies, or from a pail of water and to know that those sparks are identical with the lightning of the clouds.[54]

Or

> let a man be shown in such manner as to be rationally convinced that his own body constantly sustains a pressure of fourteen or fifteen tons, and he will not regard it as a matter devoid of interest.[55]

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[51] Ibid., p. 226.

[52] Lemuel H. Parsons of Bucks County Academy.

[53] Inquiry into Education, p. 5. Note that this address was originally delivered before the Bucks County Lyceum, August, 1835, as well as before the Newtown Lyceum.

[54] Ibid., p. 11.

[55] Ibid., p. 9.

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> And the round ocean and the living air,
> And the blue sky, and in the mind of man....

"If, with the poet," ventured one writer in the Analectic (to whom the "universality of the law of gravitation" was astonishing and electrical phenomena wonderful)[56]

> if, with the poet, we admit the universal existence of a sentiment, [an] inherent delight at the perception of what is fair, and beautiful, and good, we must allow, that it was implanted in the human breast by the bountiful author of all good, for wise and valuable purposes. For my own part, I cannot but consider this faculty as the source of many of our most delicate mental enjoyments; as the seeds of much of that harvest

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[56]"G.," "An Essay on the Classification, Mutual Relations, and Various Uses of the Physical Sciences," VI (1815), 128:

> The universality of the law of gravitation has been delicately expressed by the modern poet--
>
> > The very law that moulds a tear,
> > And bids it trickle from its source;
> > That law preserves the earth a sphere,
> > And guides the planets in their course.

And further (p. 132):

> To the high and elevated pursuits of the philosophical student, it likewise belongs to investigate the nature of that powerful and mysterious agent, which, collecting the materials of its awful battery within the dark bosom of the hovering tempest, fills all animated nature with apprehension and dismay. Its irresistible power, its immeasureable velocity, its vivid and dazzling coruscations, its loud and violent fulminations, with the frequent and alarming exhibitions of its might, render it, unquestionably, one of the sublimest agents of nature. Its phenomena are to be ranked among those which must readily inspire the sentiment of wonder and of fearful curiosity.

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> of delight which confers upon intellectual existence its greatest value. From the energy of this faculty, operative upon minds, in which the powers of reason, judgment, fancy, and feeling are nicely balanced, have proceeded many of those high designs, those noble efforts of genius, those toilsome but indefatigable labours of the philosopher, the mechanic, and the mathematician and those disinterested efforts of the philanthropist, which give to the great fabric of society its fairest proportions.

Nothing in this "native faculty," we are assured, is "at variance with the pure dictates of divine truth;" everything "in its operations" accords "with religious duties." And it is in this very "part of our mental constitution" that we find the reason for the inestimable value of natural science--the highest motives for its cultivation; since it is the "faculty" that renders us receptive to the beauty, goodness and sublimity of nature. Hence, we may say with Akenside:

> 'Ask the swain,
> Who journeys homeward from a summer-day's
> Long labour, why, forgetful of his toils,
> And due repose, he loiters to behold
> The sunshine gleaming, as through amber clouds,
> O'er all the western sky; full soon, I ween,
> His rude expressions, and untutor'd airs,
> Beyond the power of language, will unfold
> The form of beauty smiling at his heart,[57]

It is not unusual to find the pious and practical Baconian thus mingling with his other considerations romantic

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[57] Ibid., pp. 146-148. Note the Hutchesonian psychology here, which was a factor in the rise of sentimentality in Western Europe.

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musings reminiscent of "Tintern Abbey." The Reverend George Emerson would have given natural history a natural philosophy ' a home in every breast,' because they were "best suited to the mind in its earliest stages" by "a thousand intimations" of rapport between nature and the child.

> The volume of nature, with its infinite variety, is spread out before the opening eye, every page teeming with interest, inviting and rewarding inquiry. Towards this the young heart leaps out with a native and energetic fondness, which all the perverse influences of a bad education are hardly sufficient to repress. Every object is full of beauty, every sound has an echo, in the heart of a child. Is all this to no purpose? Shall the harmony between the world without the unperverted affections, teach us no lesson?[58]

Apparently every schoolroom contained young Wordsworths who were "haunted" by "the sounding cataract," and to whom the colors and forms of "the tall rock, the mountain, and the deep and gloomy wood," were "an appetite, a feeling and a love."

The Unitarian clergyman, William B. O. Peabody, was also a pious and practical Baconian, for whom the reasons of a romantic poet were altogether cogent. In the years which he spent urging greater interest in scientific studies, he ran the gamut of alleged benefits: reiterated the idea of progress through science and the arts, spoke of physical

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[58]"On the Education of Females," American Institute of Instruction Lectures, 1831, p. 29.

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exercise and intellectual discipline, of piety and an end to "the horrors of a vacant mind" and to the vices born of "vacant and unguarded hours."[59] And he rose to the postulation of spiritual communion between man and nature. Nature was apparently designed for this as its ultimate blessing. Just as the full import of a moral truth becomes apparent with close study of it, he wrote, so "with every material thing; let the mind be intently fixed upon it, and hold it in the light of science, and it gradually unfolds new wonders."

> The flower grows even more beautiful, than when it first opened its golden urn and breathed its incense on the morning air; the tree, which was before thought of only as a thing to be cut down and cast into the fire, becomes majestic, as it holds its broad shield before the summer sun.... All things in nature inspire in us a new feeling, and we begin to consider their fate and fortunes, their birth and decay, as resembling those of man.[60]

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[59]"Habits of Insects," N. Am. Rev., XXXV (1832), 197-198; "Study of Natural History," N. Am. Rev., XLI (1835), 406-409, 420-430; "Professor Hitchcock's Report on the Geology, etc. of Massachusetts," N. Am. Rev., XLII (1836), 423-425.

[60]"Audubon's Biography of Birds," N. Am. Rev., XXIV (1832), 366. Intellectation, it should be noted, is combined with sentiment here. Peabody concludes this passage with: "The truth is, that ignorance and indifference are almost the same, and we are sure to grow interested as fast as our knowledge extends, in any subject whatever." To Peabody the scientific and imaginative approaches to nature are not at all inimical:

> But some may doubt whether this feeling...

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It is not utility alone, he insists, that recommends natural history to us--but principally its importance "to the man";[61] for "the love of nature belongs to the human heart."[62] It opens to man the means of retreat from the business and political world of "dusty strife" to a world of "passionless excitement."

> And how can it be otherwise? There is an expression in the face of nature, that can be seen by every eye,--a gentle and gracious expression, which inspires confidence and love. We know not why it is, that divines have found so much fault with the doctrine of Pope's Essay on Man, that 'the body nature is, and God the soul'; philosophical examination it may not bear; but considered as poetry, it well expresses the truth, that nature is not inanimate nor unmeaning; that there is something in it which gives it spirit, life and expression; and that this soul of the universe is no other than the Being whose power

[Footnote 60, contd.]

> will accept the guidance of science, and submit to its restraints; whether it can be elevated from an imaginative sentiment into a steady and well governed enthusiasm, such as improvement in science requires. On this point it can be easily shewn, that wherever there is scientific zeal, it is invariably associated with a strong attachment for nature; and more than this, there are examples to shew, that those who have made themselves illustrious in these pursuits, had their attention turned to the subject by the early love of nature.

Nor is it to be expected that "a drudgery and cold exactness in science" will "quench the love of nature". N. Am. Rev., XLI(1835), 414-415.

[61] N. Am. Rev., XLI, 420.

[62] Ibid., p. 412.

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> created, whose wisdom sustains, whose goodness crowns all.

"This love of nature," Peabody adds, "as a 'thing of life' explains the fact, ... that in our communion with nature, we never feel alone."[63]

Particularly is it to the young, he contends, that the study of natural history addresses itself.

> They should be instructed in Natural History, not because it may lead to something useful, but because, without looking to any other result, the mere pursuit is improving to the mind and heart.

For their faculties are eminently suited to the study of nature--extremely sensitive to its lessons. Seeing with the eye of childhood,

> there is something fresh and animating in their view of the creation; they long to know everything within their sphere; the world seems enchanted; it awakens trains of thought and feeling, which, to them, are glorious and unbounded.

Unfortunately,

> as they grow older, this curiosity subsides; its indifference grows and gains upon them, till, when they are men, they stand without interest amidst the beautiful and grand of nature, conscious of their ignorance, and yet not desiring to know. Verily, the doctrine that man must be born again, is philosophically as well as religiously true; he must renew the childhood of his soul, before he can ever desire to learn what it is shameful not to know. Restore him his child-

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[63] Loc. cit.

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> like feelings, and his cold heart will kindle with new intellectual desires; he will burn to know the history of every delicate flower on the earth, and every bright star in the sky; and when he sees the countless multitude of wonders that solicit his attention, he will begin to value the hope, perhaps we should call it something more than hope,--that he may walk forever in the same path of knowledge, of light shining brighter and brighter, which he is travelling in this world below.[64]

One contributor to the Literary Gazette urged the study of botany, precisely because it promised to bring one into contact with the refreshing, soothing, purifying influence of nature. "I shall never cease to be grateful to botany," the writer asserted,

> were it only for many a delightful ramble, into which it has led me, amid rural scenes of tranquillity, beauty, and peace; where, dropping the burdens of life, and throwing off the oppression which sedentary occupation loads upon the spirits, I have passed from green valley to green valley, exultingly hailing, at every step, the discovery of some lovelier and rarer floweret, whose acquisition imparted a temporary triumph, I do not say greater, but how much more innocent, than the triumphs gained in prouder conquests. And how revivifying it is, in the heat of summer, when the whole sky seems to swim in a sea of dazzling light, to quit the world of brick and mortar in our cities, for the cool, refreshing shades of the country, whither the botanist is summoned ... where his imagination and his heart are equally elevated and improved by the contemplation of God's magnificent creation.[65]

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[64] Ibid., pp. 417-419.

[65] "The Study of Botany," U.S. Lit. Gaz. II(1825), 108.

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Mrs. Sigourney, troubled at the 'imprisonment' of children in ugly, ill-ventilated schools, called for the study of nature as an effective means of developing "the perception of the beautiful," and of thus 'softening and refining the masculine character.' "Shall not," asked Mrs. Sigourney,

> those, whom we lead by the hand for a little while and profess to educate, be taught to admire the all pervading spirit of beauty which
>
> > 'Glows in the stars, and blossoms in the trees,
> > Lives through all life, extends through all extent,
> > Spreads undivided, operates unspent?'

"Do any reply," she adds,

> that the perception of the beautiful is but a luxurious sensation, and may be dispensed with, in those systems of education, which this age of <u>utility</u> establishes? But is not its culture the more demanded, to throw a healthful leaven into the mass of society, and to serve as some counterpoise for that love of accumulation, which pervades every rank, intrudes into every recess...?

Surely,

> Nature, studied through her own beauties, not only humanizes and delights, while that study is pursued, but extends an influence to the remoter periods of life. A true love of Nature, acquired in childhood, is like a sunbeam over the clouded parts of existence, and often grows more vivid with the lapse of years.

If, then, this be true, and "the perception of the beautiful" through Nature tends "to refine and sublimate the Character; ought it not to receive culture throughout the whole process

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of education?"[66]

To the members of the American Institute of Instruction, Clement Durgin suggested natural history as an antidote for the "feverish excitement" and preoccupation with "trifles" which he considered altogether too prevalent in the United States. "Natural History," he explained,

> is not the amusement of a day, but it opens an inexhaustible fund of enjoyment, by enabling us to perceive the beauties of nature. It unseals that book, in which are written the wonders of creation; it raises the thoughts and feelings, refines the taste, corrects and improves the judgment, gives mildness to temper and amiableness to disposition, which soothe the frequent pangs along the rugged paths of life, and strew the vale of declining years with many a thornless flower, in the recollection of innocent enjoyments.... In teaching Natural-History to children, then, we do but obey the dictates of nature, in introducing them to her countless wonders and varying scenes, where, if they wander, it is in innocence and light: we do but follow the footsteps of philosophy to her refreshing fountains, on whose flowery banks, manhood may pause to contemplate and admire, and age at the harvest become renovated by a remembrance of the past, and be blest in the anticipations of a spring, when itself and all things shall be clothed in loveliness and beauty.[67]

At the 1835 meeting of the American Institute of Instruction, Dr. Walter Channing also discoursed upon the elevating,

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[66]"On the Perception of the Beautiful," Common School Journal, II (1840), 83-86.

[67]"On Natural History as a Branch of Common Education," American Institute of Instruction Lectures, 1831, pp. 235-236.

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refining influence that steals into the heart and mind of the student of nature who contemplates 'the garment of spirit.' "Whether in the smallest hand specimen of a mineral species, or in the congregated Alps," he announced, "the external, alike in its vastness, and its minuteness, is related to the moral, is designed to act upon it, and for the highest ends."[68] It teaches us to be humble,[69] and it conveys a lesson in tranquillity--a lesson, much needed in our restless bee-hive of a world; a lesson of quiet performance of one's purpose--of self-fulfillment in repose. In this itself, Dr. Channing maintained, can be discerned a spiritual kinship between man's power of thought and the principle of creative activity underlying the ceaseless and unobtrusive operations of nature.[70] Moreover, to study nature is to study truth; not only demonstrable phenomena, but truth itself.

> What is the study of natural history but a study of truth? Not an external truth, so to speak, only or chiefly, but a quality, I had almost said a spiritual quality, which belongs to the works of God, and by which we, man, are related to them and they to us.

Admittedly, we may never attain to the whole truth of nature:

> Our sight may be feeble, and a very little of nature may be made known to us. But the little here is as true as the whole. He who has studied

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[68] "On the Moral Uses of the Study of Natural History," American Institute of Instruction Lectures, 1835, p. 255.

[69] Ibid., pp. 256-257.

[70] Ibid., pp. 258-260.

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> a single blade of grass,[71]--loved the humblest flower, or had his heart visited and filled with happy thoughts by any portion of God's universe, has known the truth,--he has in that small joy though it may be, a treasure which will be ministered to and increased by every new revelation of beauty, by every kindred joy he may know. It is this character in the external, of the universe, this spirit of internal life, and endless growth, this truth, which relates the external to man; and leads him out to it for that which he most longs for, permanent sources, true means of his felicity.[72]

And so Dr. Channing anticipates much good from such things as collections of natural history, since "they are related alike to the intellect and the affections"; since, "with all the external world," they "are a revealed force"--

> manifestations of power within and around them, which is felt by us to be like to that power within ourselves which gives to us efficiency; the force-principle, if I may so speak, in virtue of which we do alike the will of God, and carry into effect every purpose, accomplish every design.

"Is there," he asks, "any other way by which the external world can do man good?"

> Is it beauty that attracts us,--and can it do so, but by a power or state within us, with which it is in perfect harmony? Is it in the external world only, or with forms, that we have to do? If so, how is ... that which is without form, so to speak, the unlimited and illimitable spirit, so readily brought to sym-

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[71]One is reminded of Whitman's "I believe a leaf of grass is no less than the journey-work of the stars..." Song of Myself.

[72]"Moral Uses," pp. 257-258.

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> pathise with that external; to gain instrument from it--to feel deeply conscious that in the enjoyment of the beautiful, its capacity of farther enjoyment has been revealed to it; and, in this conviction, to find a new and stronger motive to go farther than the actual, that which it has already acquired, into new regions of nature, to gather there new and larger supplies for the mind's wants, and this in endless progression. There is nothing mysterious or unintelligible in this notion of the relations of the external with ourselves, of the inherent power in them, in virtue of which, they are just what they are, with that within us which constitutes ourselves. At least the mystery is no greater, than our own nature, and he who rejects a great truth, because it involves the condition of faith before it can be received, has but a narrow field of truth before him. He has little more to ask than wherewithal he shall be fed, clothed and sheltered, and how he may in the easiest mode satisfy these conditions of his comfortable being.[73]

Since the potential benefits of natural history are so great, its study "must be available to all classes of society: spiritual nourishment is not to be the privilege of a few."[74] Natural history collections should everywhere be thrown open to the people,

> that they may acquire moral, intellectual, incorruptible wealth from its true sources,--that they may be awakened to the love and veneration of the beautiful and true,--that here the mind may rest from its unsatisfying labors, and a more healthy tone be imparted to the moral state of communities.[75]

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[73] Ibid., pp. 262-263.

[74] Ibid., p. 265.

[75] Ibid., pp. 267-268.

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Such is Dr. Channing's faith in the moral efficacy of nature study--a faith grounded in a theory of correspondence that inevitably suggests Ralph Waldo Emerson. With Channing scientific investigation becomes a counterpart of mystic contemplation; and the scientist the high priest of a species of transcendentalism. Possessed of such significance, it is not strange that natural history should evoke zeal in its pursuit. "How deep," he exclaims,

> is the interest, then, in nature, and in its constant study. How does it all come to us with revelations of beauty and of good, in all and every of its manifestations. How does it speak of the internal power, of which it is the external, the visible representation,

No longer do we wonder at men pursuing these studies with such zeal--"panting on the line" and calmly enduring "pain and privation to the farthest pole."

> These men are the truest spiritualists, for without the enduring perception of the exact harmony between themselves and the whole of nature, they must have failed; but in the clearness of their internal light, they have never attempted the impossible, and therefore has it been that they have come back again from their long exile from man, and brought with them the proofs of a power within and without them, which otherwise would in its whole amount have never been known. The intellectual and spiritual relations of the external, then, are those things for which we should love and truly prize nature and its studies. They are the best nutriment for the mind, and for the affections. When seen in their truth, these studies never produce price, and for benevolence, they are the best ministers. We feel always and ever, that such studies belong to everybody, in the great sense of universal community. The naturalist, who writes in the true inspiration

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of nature, does it for the whole human family.[76]

In 1837 the assembled members of the Institute also heard another speaker declare that it was man's 'instinctive interest' in the objects of nature which "might be regarded as the first progressive step from barbarism to civilization," since "the first ideas of majesty, excellence and beauty were undoubtedly conveyed to the mind through these." and they were further informed that "a striking analogy" obtains between the same powers of mind exhibited in the youth of the individual and the youth of the race; that

> to the simple and uninstructed mind of every child, these identical lessons of majesty, excellence and beauty are familiar and perceptive.

For the child, with his spontaneous curiosity and delight in all the phenomena of nature, is keenly sensitive to their influence. Not, however, that we do not find in the adult also this instinctive tendency "gushing out into spontaneous and unbidden admiration"--and "under the most unpropitious circumstances." But it is in the child that it is especially strong.[77] It was also the opinion of Mrs. Sigourney, that "the perception of the beautiful" in nature

> takes root, most naturally and deeply, in the simple and loving heart; and is, there-

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[76] Ibid., pp. 263-264.

[77] John L. Russell, "On the Study of Natural History," American Institute of Instruction Lectures, 1837, pp. 78-81.

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> fore, peculiarly fitted to the early years of life, when, to borrow the language of a German writer, 'every sweet sound takes a sweet odor by the hand, and walks in through the open door of the child's heart.'[78]

The child is father of the man, and the race too had its childhood of natural, pure feeling! When we are receptive to the beauty and harmony of natural surroundings, observed Follen,

> we return, unconsciously, to the primitive worship of the uncivilized children of nature, who, in the silent gloom of primeval forests, perceived the footsteps, and listened to the voice, of the present Deity.[79]

Other addresses and essays of the period can supply additional examples of this same sort of sentimental naturalism connected with exhortations to study the phenomena of nature. Primitivism even mingled with Old Testament history in one address delivered at the Maryland Horticultural Society's 1839 exhibition. The speaker urged the cultivation of gardens because thereby is

> a religion silently but truly taught, to which meditation gives the most consoling tone; the conflict of exclusive and intolerant opinions are there unfelt and unheard; but we hold converse with Nature, and from her flowery lap raise our eyes and hearts in adoration to Him....

It seems that it is when man is closest to nature that he is in the purest religious state:

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[78] Op. cit., p. 86.

[79] Works, II, 233.

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> How touchingly beautiful and sublime are the pictures of those primitive days, when, under their own vines and fig trees, the babbling brook at their feet, and the bleating and spotless flock around them, the shepherds of Israel poured forth their morning song of praise to Him who made the meadows to nourish and the trees to shade them. With what fervor did they exclaim, 'The Lord is our shepherd....' The altars of christianity never burned with a purer incense than this: and are we not then invoked now to realize from the pursuits of this society the primitive charms and excellence which they impart?[80]

And which they impart through a benign influence operating directly upon the human spirit, for nature is in accord with the purest elements in the constitution of man.

> The studies of the closet and the feverish pursuits of life, wear down the body and corrode the spirit; but here is a pursuit full of beauty and freshness--peaceful and lovely are its ways--pure and uncontaminated is the cup of its joys; its study and culture will assuage anger, moderate ambition and sanctify love, and raising the heart from objects of temporary interest, place it on those of eternal hope, keep with us and about us the bloom and fragrance of life's weary journey, and make us wiser and better in our day and generation.[81]

We find, then, scientism and sentimentalism again merging in the Baconian attitude--here in association with the culture of the individual. It was not only as an intellectual pursuit--a pursuit demanding rigorous application of reason

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[80]Zacheus Collins Lee, "Address Delivered Before the Horticultural Society of Maryland, at its Annual Exhibition, June 6, 1839," reprinted in South. Lit. Mess., V (1839), 763.

[81]Loc. cit.

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and promising tangible benefits--that science deserved such high praise; but also because of a soft, pure influence it shed as a light of fancy over Tintern Abbey. In my next chapter I shall endeavor to indicate these lines of thought and their mingling in Baconian pedagogical theory: to point out the presence, and certain connotations, of the related concepts of knowledge as power and of 'nature' as the guide to truth, in the theory itself of education.

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CHAPTER III

Pedagogy Naturalized

At the same time that educators were advancing their arguments in favor of the acquisition of knowledge that is power over matter, they were also urging the diffusion of knowledge that is power over man. In the latter case a promise of progress issued from the conviction that the well-being of man was secure only in proportion to his understanding of the laws of nature operative within him. The corollary, as earlier pointed out,[1] was that man is the product of natural laws, demonstrable scientifically, and once understood, scientifically controllable. To further this understanding, Baconian educational reformers advocated the study of anatomy and physiology--even of phrenology--in the schools. Combe, convinced that the infringement of natural law (by definition amenable to Science) is a fundamental cause of evil, would have had even ministers of the Gospel employ anatomical and physiological knowledge

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[1] Vid. ante, ch. vii.

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as a peerless ally of hortatory ethics.[2] And the American Institute of Instruction, proving itself sensitive to the intellectual currents of the day, heard at its meetings addresses on the value of courses in anatomy and physiology[3] and animated controversy on the educational possibilities of phrenology.[4] Moral as well as intellectual improvement was promised as a result of the advancement and application of physical as well as mental science.[5] Man was submerged in nature and science was the key to nature. The law for things was also the law for man.

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[2]Cf. Constitution of Man, especially the "Conclusion," pp. 276-288; ‹Ray›, "Constitution of Man Considered in Relation to External Objects," Christian Examiner, XII (1832), 403-404. These views of Combe have already been noted. American phrenologists echoed the master in these exhortations. Cf. O.S.Fowler, Phrenology and Physiology Explained and Applied to Education, pp. 7-8; Silas Jones, Practical Phrenology (Boston, 1836), Preface, p.viii. Incidentally testifying to the interest being evoked by the subject, the New England Magazine, V (1833), 250-252, and the North American Review, XXXVII (1833), 59-83, took the trouble to bring forth rejections of these 'pretensions of phrenology.'

[3]Clement Durgin, "On Natural History as a Branch of Common Education," American Institute Lectures, 1831, p. 233; Edward Reynolds, "On the Importance of a Knowledge of the Principles of Physiology to Parents and Teachers," American Institute Lectures, 1833, pp. 39-69; T. B. Fox, "On the Meaning and Objects of Education," Amer. Inst. Lectures, 1836, pp. 47-70; Usher Parsons, "On the Brain and the Stomach," Amer. Inst. Lectures, 1840, pp. 113-131.

[4]"Journal of Proceedings," Amer. Inst. Lectures, 1833, pp. xii, xv-xvii; American Inst. Lectures, 1834, pp.xxi-xxii.

[5]Cf. E. Reynolds, op. cit., pp. 67-69; W. A. Alcott, op. cit.; Usher Parsons, op. cit. (Usher Parsons was one

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Now all this pointed to a revaluation of the method and content of formal education, guided by naturalistic presuppositions. To the Baconian as pedagogue the science of man was the essential basis for the proper cultivation by the schools, of his mind and heart as well as body; method and content had to be in harmony with fixed natural laws, and this could only be achieved on the basis of sci-

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«Footnote 5, contd.»

of the organizers of the American Medical Association and a four-time winner of the Boylston Prize.) On this and the general argument advanced for introducing the science of man into the schools, see also: "American Health Convention," N. Am. Rev., XLVII (1838), 381-395; Daniel D. Barnard, Introductory Lecture before Troy Young Men's Association; C. Caldwell, Thoughts on Education, pp. 162-163; Robley Dunglison, Address to the Medical Graduates of the Jefferson Medical College, Delivered March 11, 1837 (Philadelphia, 1837), p. 11; Horace Green, Introductory Address before the Students and Trustees of the Vermont Academy of Medicine: Delivered at the Opening of that Institution, Castleton, March 11th, 1840, (Rutland «Vt.», 1840), p. 4; «Enoch Hale», "Hayward's Physiology of Man," N. Am. Rev., XXXIX (1834), 395-400; Frank H. Hamilton, Introductory Address, and Catalogue of Students Attending «his» Annual Course of Lectures on Anatomy and Surgery (Auburn, 1837), pp. 10-12; "Lawrence's Lectures," Am. Quar. Rev., III (1828), 322-326; T. H. Palmer, Teacher's Manual, p. 183; Usher Parsons, Importance of the Sciences of Anatomy and Physiology as a Branch of General Education, being an Introduction to a Course of Lectures to the Upper Classes in Brown University, Cambridge, 1826 (cf. review of same, U. S. Rev. and Lit. Gaz., I (1826), 88-93); W. H. Seward, "Education," Works, III, 144-145. Note that in 1834 there appeared George Hayward's Outlines of Human Physiology, Designed for the Use of the Higher Classes in Common Schools, Boston, 1834. Of this work the North American's reviewer (E. Hale, vid. ante this footnote) expresses the hope "that the publisher will put a portion at least of future editions into the dress of a parlor book," since "there is something in the air of a school-book, which does not always carry pleasant associations with it into the parlor." (p. 412)

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entific knowledge of the constitution of man. When educational procedure accorded thus, it was 'natural'; it could not but be the most efficient, the most pleasant for the child, the most applicable to life, and the most warrantably conducive to full and harmonious development of all the faculties. Educators were not only to teach 'vital scientific truths' about the nature of man, but also to teach more effectively as a result of applying these truths to pedagogy. In other words, with a more perfect understanding of the constitution of man, the educator could both teach the science of man and teach according to the science of man, thus bringing nearer to fulfillment the promise of a brave new world.

It was partly with the expectation that physiology and 'mental philosophy' would yield richly for pedagogy, that some urged a more important place for them in the curriculum. In 1833 the American Institute of Instruction heard a speaker announce it as "one of the cheering omens" of our times, "that parents and teachers are beginning to concentrate upon all the errors of the past, the only light by which they can be distinctly seen; the light of physiology." "The more it is studied," they were informed,

> the more its importance will be felt. No other science will so clearly reveal some of the errors that have prevailed in all ages, upon the subject of education.[6]

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[6] E. Reynolds, op. cit., p. 69.

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Behind such prophecies as this lay the belief that a science of education would give man control over the development of human personality and eventually banish vice and corruption from the earth. It was the lesson being taught by Pestalozzi's Leonard and Gertrude.[7]

Accordingly there was general interest in the advancement of teaching on the basis of the scientific or 'inductive' method. When the Academician, one of our earliest journals devoted to education, appeared in 1818[8] it carried

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[7]Pestalozzi's Gertrude followed a 'natural' and sentimental method of educating - involving sympathy, work and piety - which eventually reformed the village of Bonnal. The plan of the Bonnal school - the ideal - was "in harmony with the inner nature of man and his actual social condition." Leonard and Gertrude, translated and abridged by Eva Channing (Boston, 1885), p. 174. After the regeneration of some culprits subjected to Gertrude's method for experimental purposes, "all hearts were filled with sweetest promise for the future." Ibid., p. 181.

[8]Its full title was The Academician: Containing the Elements of Scholastic Science, and the Outlines of Philosophic Education, Predicated on the Analysis of the Human Mind and Exhibiting the Improved Methods of Instruction. It was edited by Albert and John W. Picket (or Pickett). Only 25 semi-monthly numbers were issued, the last on January 29, 1820. Its content consisted primarily of dry comment on Pestalozzi, Fellenberg, Lancaster and Bell, as well as an abstract of Jardine's Outlines of Philosophical Education. Seven years earlier the Pickets had brought out what was probably our first educational magazine, the short-lived Juvenile Monitor, or Educational Magazine (New York, 1811). These two and the American Sunday-School Magazine "were apparently the only educational periodicals in America before 1826." Cf. F. L. Mott, A History of American Magazines 1741-1850, p. 148. In 1837 the Pickets were editing the Western Academician in Cincinnati. Albert Picket became a leader among Western educators. Cubberley, Public Education in the United States, p. 169.

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with it this editorial opinion:

> Influenced by the important nature of the subject in which we have been engaged, we had it in view, to offer such elementary instruction as may tend to facilitate practical tuition, and to lay the foundation of deep and scientific acquisition. We have endeavoured to predicate the system developed in the work, on a strict analysis of the human mind, and to render metaphysical science, or the study of mind, a knowledge of which, to teachers, has hitherto been deemed almost an useless auxiliary, a necessary and concomitant part of every person's acquisitions engaged in the instruction of youth. Without this knowledge of ... the laws which govern the human mind, progress of no great extent or solidity can be expected either from the pupil or his teacher.[9]

And in a later number, in an abstract of Jardine's "Outlines of Philosophical Education," "every one engaged in teaching" is exhorted, as his "indispensible [sic] duty,"

> to record observations, to watch the progress of the unfolding of the human faculties, to begin the work of reformation with trials or experiments; and thus to unite their efforts in contributing to the general improvement of the human reason.[10]

For the editors of the Academician believed that

> though Lord Bacon directed the application of the Inductive method of reasoning chiefly to the discovery of the laws of the material world, it may, notwithstanding, be also applied, in its leading principles, at least, to investigate the properties of the laws of mind.[11]

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[9] I (New York, 1820), Preface, p. iii.

[10] Ibid., p. 389.

[11] Ibid., p. 339. Vid. ante, pp. 190-193.

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James G. Carter, one of the leaders of educational reform in Massachusetts, deemed it "astonishing" that the inductive method had not yet been adequately applied in education. Textbooks and teaching methods, he insisted, should be based on the principles set forth by Bacon. "The triumph of the inductive method," he wrote,

> although it is a cause, which has more changed the state of the arts and sciences, and consequently the whole face of the world, than any other, which has operated within the reach of history, is but half complete, till it is carried into the subject of education. The principles of the inductive philosophy should be as vigorously followed in education, as any other department of human knowledge.[12]

One writer for the American Journal of Education can see no reason "why the principles of the inductive philosophy should not be rigidly followed in education, as in any other department of human knowledge." In his opinion, the value of the educational philosophy of the Edgeworths, father and daughter, derived precisely from its "consisting very much of experiments accurately recorded."[13] In 1829 the Journal presented a review of a new edition of Bacon's Advancement of Learning, with the hope not only that Bacon would be more widely read, but that traditional

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[12] Letters to Prescott, pp. 63-66.

[13] III (1827), 108.

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ideas of education would be revised in accordance with his principles.[14] At about the same time, Walter Johnson, ever eloquent on the theme of educational progress, proclaimed that

> a constantly increasing interest in the subject, forbids us to suppose that the science and practice of instruction, can remain stationary, while other arts and sciences are advancing.[15]

And the Literary Gazette's reviewer of William Russell's Suggestions on Education is led by his consideration of this work to add it as his own opinion that Bacon gave us, in the inductive method, the key to right education.[16]

The idea that pedagogy could and should be elevated to a science was heard at several conventions of the American Institute of Instruction. Thus in 1833 Abijah R. Baker argued the importance of applying the inductive method to the study of mind. If education is to advance, he held, a "practical metaphysics" of the intellect must be acquired by every teacher. For unless this be done,

> education can never become a regular science, and as much an object of study in our Academies, Colleges and Universities as that of chemistry or mathematics.

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[14] IV, 132-142.

[15] "On Combination of Practical with Liberal Course of Education," Journal of the Franklin Institute, II (2d series, (1828), 55.

[16] I (1825), 322-323.

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"Almost everything," he complains,

> which has as yet been published on this subject consists either of a mere collection of facts, which have never been classified or reduced to a regular system, or of mere arbitrary rules, with little or no development of the principles from which they have been derived. And from the nature of the case, this must continue to be so, until the philosophy of teaching, or, what is the same thing, the application of practical metaphysics to instruction, be better understood. Till then, teaching cannot become a distinct profession. We may give it that name; but it will not have the substance. Till then, the world cannot be redeemed from darkness to light, and from ignorance to a knowledge of the gospel of truth.[17]

In 1837 both the Reverend Elipha White of South Carolina and the Reverend John L. Russell of Hingham held forth on the same subject before the Institute. In the Reverend White's opinion, the 'whole man'--physical, intellectual and spiritual--will not be successfully, harmoniously, developed until education becomes a science: until "from nature we learn the great leading, eternal principles of our being." A world free from strife and misery must be founded on such an education.[18] And likewise the Reverend Russell's

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[17] "On the Adaptation of Intellectual Philosophy to Instruction," American Institute Lectures, 1833, pp. 264-265, 287-288.

[18] "Introductory Discourse," American Institute Lectures, 1837. Elipha White illustrates the merging of Puritan, 'naturalist' and Scotch philosopher (Ibid., p. 10):

> Ignorant of the essence of mind, and limited in our acquaintance with its operations, we are not to follow the schoolmen in their metaphysical

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hope in the increased ability of education to elevate man intellectually and morally rests on the application of scientific knowledge--knowledge which is power--to educational

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[Footnote 18, contd.]

> speculations and vain theories. No a priori reasoning may be applied to the mind, and no deductions drawn from it are safe. ...Nor are the names of Socrates, Plato, and Aristotle, philosophers and metaphysicians of ancient fame; or those of Descartes, Leibnitz and Locke of the modern school, sufficient to sanction their utility, and render safe a practical application. But with Reid, Stewart and Brown, the phenomena of mind may be known, and by induction classified and traced to appropriate mental faculties that can be improved. And this is the province of education.

Further, he announces that "education must be conducted in accordance with the established principles of nature, revelation and providence;" and goes on to explain that harmony exists among all three. He maintains that "nature is the first volume to be employed in education," and that, from nature, we can ascend to 'nature's God.'

> Nor do these established principles of nature differ from those of revelation. Indeed the revealed will of heaven - the Bible, in all its moral principles, is but a republication - second edition of nature... Indeed, providence is only a commentary on nature and revelation - a daily periodical illustrating and enforcing the principles of both: and therefore should be employed as the third, and only remaining volume necessary to an entire education.
>
> Ibid., pp. 13-14.

Cf. Pestalozzi's "I now sought for laws to which the development of the human mind must, by its very nature, be subject. I knew they must be the same as those of physical nature, and trusted to find in them a safe clue to a universal psychological method of instruction." How Gertrude Teaches Her Children, ed. E. Cooke (Syracuse, 1898), p. 132.

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method.[19] "It is this self-same principle of knowledge to confer power," he declared, "which connects it so intimately with education."[20] The following year the prolific producer of Peter Parley's soberly instructive adventures, Samuel Goodrich, also insisted before the Institute, that scientific investigation of the laws governing man (design of the Creator) must precede the proper cultivation of his physical, moral and intellectual being.[21] "The search which would detect ‹these› ruling laws," we read in the North American for April, 1839,

> and learn the science which combines them into orderly arrangement, and attain to the wisdom which teaches to use this science to good purpose, cannot penetrate too deeply into the mysteries of man's constitution and destiny; for in the inmost depths of his being these laws are at work, and at the earliest moment of his being they began their work.[22]

The normal school movement itself was an expression of the belief that a 'science of pedagogy' is possible, and indispensable to the progress of civilization.[23] Those who

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[19] Op. cit., pp. 71-89.

[20] Ibid., p. 77.

[21] "Man the Subject of Education," American Institute Lectures, 1838, pp. 166-168.

[22] "Goodrich and Taylor on Domestic Education," N. Am. Rev., XLVIII (1839), 382.

[23] This idea was expressed by Francis Wayland in the first address delivered at the first convention of the American Institute of Instruction: Introductory Address, Delivered in Boston, before the Convention of Teachers, and other Friends of Education, Assembled to Form the American Institute of Instruction, August 19th, 1830, pp. 13-14.

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enjoined the establishment of courses and schools devoted exclusively to the training of teachers spoke of elevating education to the dignity of a science; referred to an increase in available knowledge and the promise of further increase; insisted that the 'science' was so important and its content already so complex, that no prospective teacher could instruct satisfactorily without special preparation. James G. Carter insisted that special preparation by means of normal schools is a fundamental necessity, since

> there is no science, which is so difficult to be reduced to general principles, as that of education,--none where the faithful and patient induction of large experience, is so essential.[24]

Early in its career the Journal of Education proclaimed its espousal of the cause of special training for teachers in the interests of a more scientific, hence more competent, education of youth.[25] The Literary Gazette is likewise convinced of the need and achievability of a science of education. "It may be new to some of our readers," it ventures,

> to hear the subject of education spoken of as a science. And we must confess that we apply the term to it, rather in consideration of what

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[24]Letters to Prescott, pp. 55-59. Cf. also Carter, Essays upon Popular Education, pp. 42-60.

[25]"Prefatory Address," II (1827), 8-9.

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> it should be, than of what it really is.... But is it incredible, or even improbable, that a new science may yet be disclosed? The searching spirit which has gone forth, has developed within a few years several new sciences, which before were almost unknown; or were made up of a few scattered facts, and those not systematically arranged or reduced to any general principles. Among these we might name chemistry, geology and political economy.

"So we believe," he continues,

> it will be with education as a branch of moral and intellectual philosophy. There is a whole science wrapped up in that mysterious little thing, the infant mind, which has never been developed;--a science, too, which will have a stronger influence upon the condition and prospects of men than any other. We say stronger because it relates to that part of ourselves, which is susceptible of the highest, perhaps of indefinite improvement, at a period in our lives when every bias is soonest and most permanently felt; and because it has for its object to call forth in their natural order, and put in healthy and vigorous action, all those intellectual powers, that constitute the very instruments with which we must proceed to accomplish whatever is within the reach of man.[26]

The rise of 'child psychology' is here anticipated. Although the mature mind has been investigated, we are in-

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[26] III (1825), 175. The occasion for these and the following remarks was a review of T. H. Gallaudet's Plan of a Seminary for the Education of Instructers of Youth, Boston, 1825; W. Johnson's Observations on the Improvement of Seminaries of Learning in the United States; Philip Lindsley, An Address Delivered in Nashville, Tennessee, January 12, 1825, at the Inauguration of the President of Cumberland College, Nashville, 1825.

The reviewer adds:

> We hold, and have held for many years, undoubting belief that the science of education is capable of being reduced, like

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formed, yet the child mind has "never been subjected to a sufficiently minute and rigid examination." Thus, he complains, we do not have those 'general principles' which in 'the moral education of youth must be established like all other general principles, by a regular process of induction. But there is no question about the possibility of this being accomplished.[27]

The faculty of Amherst strongly urged in 1826 that "one new department of great practical importance ... should be annexed to the College, as soon as the funds will any how permit"--a department of "the Science of Education."

> When it is considered how this lies at the very foundation of all improvement; and when so many Professorships have been established in all the other sciences, as well as in literature and the arts, it is truly wonderful to us, that so little attention has been bestowed upon the science of mental culture, and that there is not (as we believe there is not) and never has been, a single Professor of Education, on this side of the Atlantic.

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cFootnote 26, contd.s

> other sciences, to general principles. By a partial induction, or a long series of discriminating observations, the infant mind may be so far analyzed or its phenomena classed, as to enable us not only to define accurately its several powers with their mutual connexions and dependencies, but to fix with precision the natural order of their development, and to adapt to them such exercises as will develop them most successfully.
>
> Ibid., pp. 177-178

[27]Ibid., pp. 175-177.

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"Will it not be an honour," they ask,

> to that College, which shall be the first to supply this deficiency, and open a department for the thorough education of teachers?[28]

And Calvin E. Stowe, who produced the first report on European education by an American, preached the same doctrine: education can and should be reduced to a science by the systematic investigation of man's nature, and normal schools must promote this work.[29]

In outlining a program of studies for the preparation of teachers, Walter Johnson proposed that their training include, first of all, "a course of lectures and practical illustrations on the subject of intellectual philosophy, as connected with the science of education." This would have involved the study of the development of the faculties moral and intellectual, and the proper relationship of science, literature and the arts in that development. But in addition, it would have embraced

> all that relates to the management of infancy, the personal habits, form, physiognomy, and health of children and youth, and their different capabilities of learning, so far as affected or indicated by these circumstances.[30]

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[28] Substance of Two Reports, pp. 8-9.

[29] Common Schools and Teachers' Seminaries (Boston, 1839), pp. 85, 94-100. Samuel R. Hall, a decade earlier, urged the same measure for the same reason. Cf. his Lectures on School-Keeping (Boston, 1829), Pref., p. iv.

[30] Observations on Improvement of Seminaries, pp. 19-20.

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The Literary Gazette, noting Walter Johnson's argument, announced:

> We regard the fact that essentially the same idea has been advanced, almost at the same time, by different gentlemen in different and remote sections of our country, as strong evidence that the attainment of their common object is near at hand.[31]

With faith in the potentialities of a science of pedagogy connected with a science of mind based on Bacon's enlightened principles, such educators in our roster of Baconians as Governor Clinton, James G. Carter, Denison Olmstead, Gallaudet, Russell, Stowe and Woodbridge helped forward the normal school movement.[32] And "psychology," to quote the historian of education Mr. Cubberley, "soon became the guiding science" of teaching.[33]

The object of the scientific approach to pedagogy was expressly a 'natural' method of educating. With the laws of the development and operation of the mind ascertained, it was felt that the procedure and content of education could be adjusted to the true condition of the pupil. Learning, it was expected, being more 'natural' would not only be more efficient but also more pleasant. Away with

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[31] III (1825), 171.

[32] Cf. Cubberley, Public Education, pp. 371-384. The first state normal school in America was opened in 1839; the movement developed momentum sharply after 1865. Ibid., pp. 380, 384.

[33] Ibid., p. 400.

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rote-learning and the harsh discipline of the past--the discipline that went against nature, debilitated the body, caused untold suffering and too frequently warped the mind! On this point the sentimental and pious could both embrace the scientist who decreed that the law of a beneficent nature would not have made pain and ill-health the penalty of learning, particularly since upon learning depended the difference between the savage and exalted states of man. No, the past had been in error. "It will be safer as a general rule," concluded James Carter, speaking of educational method, "to assume that ‹the ancients› teach us what to avoid, rather than what to imitate."[34] There was the authority of Combe against the idea that an education of six thousand years' duration must be good.[35]

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[34] Essays upon Popular Education, p. 59.

[35] Lectures on Popular Education, p. 9.
Of course, Combe (who claimed to have Horace Mann's assurance that he ‹Combe› was "aiding him effectually and ... advancing his labours by years") adds his weight to the Baconian side of this issue. Both in his Constitution of Man and in his Lectures on Education he insisted upon the value of phrenology in advancing the science of pedagogy and complained of general reluctance to establish a philosophy of education upon principles derived from a scientific study of the mind of man. Gibbon, II, 75; Lectures on Education, pp. 7-10, 104. Conceiving of man and his environment as related by the Creator in such manner that successful living requires adjustment to, or control over, nature, Combe accordingly maintained that the central purpose of education must be to enable man to act appropriately in this environ-

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And there was Pestalozzi to direct us away from the errors of the past and to the promise of the future. Enlightened by scientific pedagogy, teachers were no longer to strive against the processes of nature. They had only to follow and supplement; they had only to feed the child's mind that which by its innate constitution (empirically discovered) it is suited to receive, in order to see the pupil blossom into harmonious fulfillment, stimulated by 'natural' joy in 'natural' learning. Teachers had only to follow the inductive method--or to borrow their light from those great leaders of educational reform: Pestalozzi, Fellenberg, and the Edgeworths. Curiously, that which nature decreed was, that the study of nature should be the basis of education.

It is not necessary here to recapitulate the history of the naturalistic movement in education; for the basic ideas associated with Condillac, Helvetius, Rousseau, Condorcet and the others constitute a pattern varying only

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«Footnote 35, contd.»

ment and where possible to extend his power over nature. Lectures on Education, pp. 49-63. The education suited to this task must be, he argued, pre-eminently scientific. Hence not only such subjects as chemistry, geology and botany are essential, but anatomy and physiology as well, especially for women. Ibid., pp. 84-100. Phrenology obviously implied a naturalistic educational theory. Vid. ante, ch. vii.

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with their sentimental or naturalistic bias,[36] and this pattern in its essential features can in any case be elucidated solely with reference to American pedagogical theory. It will be well, however, to commence with Pestalozzi because of his direct impact upon American educational thought in the nineteenth century.[37] True, the success of the "immortal Pestalozzi," as the Academician honored him,[38] was likewise the success of his precursors, especially of Rousseau, but the teacher of Yverdun stands nevertheless pre-eminent among the forces that redirected American education in this period. "The doctrines of no other great educational reformer," writes W. S. Monroe, "have received such wide dissemination and such general acceptance as those of Pestalozzi."[39] His ideas were early championed in this country by such eminent Baconians as Maclure, Griscom, Woodbridge, Carter and Mann. Maclure, in fact, sponsored

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[36] Cf. W. Goodsell, The Conflict of Naturalism and Humanism, Teachers College, Columbia University Contributions to Education, no. 33 (1910), chs. ii, v; J. Dewey, "Humanism and Naturalism," Cyclopedia of Education, III, 338-340.

[37] Will S. Monroe, History of the Pestalozzian Movement in the United States; Cubberley, Public Education, pp. 344-366, 384-396. A. D. Bache's Report on Education in Europe (1839) as well as Stowe's Report on Elementary Instruction in Europe (1837) conveyed Pestalozzian ideas to America. These were, however, only two of several channels for the communication of the 'new pedagogy.'

[38] I (1819), 341.

[39] Op. cit., p. 10.

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the first Pestalozzian school in America (Philadelphia, 1809), having brought Joseph Neef from Paris to head the establishment.[40] Since that time Pestalozzi's ideas have become modern education.

It is not surprising that Baconians of Maclure's or Griscom's outlook should have been attracted by a pedagogy that emphasized industry, piety and natural law. And in view of what we have already noted of the Baconian mind, we can comprehend why this attraction need not have been lessened because of a naturalism that was predominantly sentimental. The philosophy of the Baconians embraced both science and sentiment; and they found in the schoolmaster of Yverdun one whose chief guides were nature and feeling. "Observez la nature, et suivez la route qu'elle vous trace," Rousseau had advised in his Emile. "All instruction of man," wrote Pestalozzi,

> is then only the Art of helping Nature to develop in her own way; and this Art rests essentially on the relation and harmony between the impressions received by the child and the exact degree of his developed powers.[41]

And what nature teaches us, he held, is primarily that

> the first instruction of the child should never be the business of the head or of the reason; it should always be the business of the senses, of the heart, of the mother.

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[40] Ibid., pp. 69-72.

[41] How Gertrude Teaches Her Children, p. 57; also pp. 60-65.

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And

> the second law, that follows it, is this: human education goes on slowly from exercise of the senses to exercise of the judgment. It is for a long time the business of the heart, before it is the business of the reason. It is for a long time the business of the woman before it begins to be the business of the man.[42]

It was the application of a woman's sentiment to education that reformed the village of Bonnal![43]

Education, Pestalozzi argued, should be governed by these principles; the natural inclination of children must be followed. They must be gently led, not compelled. Their instincts are naturally good; their innate desires and powers are implanted by nature to suit the requirements of sound development.[44] It is, then, of the high-

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[42] Ibid., p. 294.

[43] Cf. Leonard and Gertrude.

[44] "Friend," Pestalozzi wrote to Heinrich Gessner, man is good and desires what is good; at the same time he desires his own welfare with it. If he is bad, certainly the way is blocked up along which he would be good. Oh! this blocking up is a terrible thing; and it is so common, and man is therefore so seldom good. Yet I believe everywhere and always in the human heart. In this faith I now go on in my untrodden way as if it were on a paved Roman road.

How Gertrude Teaches, p. 128.

And again:

> Not God's creation but this world decoys the child to the giddy dance of the whirlpool of the abyss whose depths are the home

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est importance that instructors teach in accord with the psychological laws governing the young mind. And these laws decree that, since all learning begins with sense-impressions, 'things' not 'words' should be studied, and doing should be a fundamental part of the learning process. The training of the senses as the foundation of clear conceptions was thus basic in Pestalozzi's educational method. Before all else he would have children observe accurately. That, he maintained, is the procedure decreed by nature, accordant with the way in which the mental powers unfold. The proper development of the child demands, and so nature has provided, an impelling curiosity about the external world, a strong and instinctive outward direction of the senses. The teacher should take advantage of this fact: adapt materials and method to what the child is fitted to

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«Footnote 44, contd.»

> of lovelessness and moral death. ... This world is so rocked to sleep in the ruin of a perverse and oppressive opposition to the laws of Nature that it has no mind for being the means of preserving purity in the heart of man; on the contrary, it is as careless at the critical moment of the innocence of our race as a heartless second wife of her step-child: a carelessness that in a hundred cases to one causes and must cause the wreck of the last means that is left us for ennobling our race.
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> Ibid., pp. 291-292.

Compare this with the opening sentence of Rousseau's Emile: "Tout est bien, sortant des mains de l'Auteur des choses; tout dégénère entre les mains de l'homme." The regeneration of Bonnal began with the children of the village.

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learn and to the way in which he will most efficiently learn it--all as prescribed by the immutable laws of nature. What are the activities and materials best adapted to fulfill nature's prescription? Assuredly, drawing, manual labor, physical sciences. These are all directed to the senses; they train the powers of observation; they make possible the development of clear and accurate conceptions in the 'natural' way--from concrete experience, sense-impressions.[45] Gertrude's children learned as they carded and spun, and their labors were integrated with their lessons in arithmetic. "Above all," we are told, "in every occupation of life she taught them an accurate and intelligent observation of common objects and forces of nature."[46] The Fellenberg school at Hofwyl, where (as one American advocate of similar schools described it) "science and labor are seen, hand in hand, supporting each other,"[47] was itself an embodiment of Pestalozzianism. "The plant-collecting" that Pestalozzi and his disciple Krüsi pursued one summer, so Pestalozzi himself tells us, de-

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[45] Pestalozzi's views are clearly explained in How Gertrude Teaches. Cf. also H. Barnard, Pestalozzi and His Educational System, Syracuse, c1906.

[46] How Gertrude Teaches, pp. 230-231.

[47] In a letter from Anthony Morris to Jonathan Roberts, president of the Pennsylvania Agricultural Society, which letter contained a plan for a Fellenberg school to be established in Pennsylvania; quoted AJE, III (1828), 505-506, 568-571.

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veloped in the latter

> the conviction that the whole circle of knowledge generated through our senses rests upon attention to Nature and on industry in collecting and holding firm everything that she brings to our consciousness.[48]

It was with this same conviction that Pestalozzi's one-time coadjutor, Joseph Neef, made the study of nature fundamental in his plan of a 'rational education' for America, and conversely derogated the study of the ancient languages (in fact, of foreign languages generally).[49] Briefly, then,

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[48] How Gertrude Teaches, p. 95.

[49] Sketch of a Plan and Method of Education, founded on an Analysis of the Human Faculties, and Natural Reason, Suitable for the Offspring of a Free People, and for all Rational Beings (Philadelphia, 1808), pp. 7-12, 85-102, 110-115, 132-133.

Introducing his plan, he asserts (p. 7):

> The whole cabinet of nature, beings and objects animate and inanimate, obtrude themselves, as it were on us; and yet how neglected they are! how little use is made of our faculties and these valuable means! But I shall not neglect them; I shall, on the contrary, make the most unrestrained use of them.

Again, as part of his justification for the attention given natural philosophy (p. 91):

> When the infant first sucks, it seizes, presses, or champs the nipple, which the mother brings in contact with its lips; and this is done, perhaps, with no more consciousness than the tendril of the kidney-bean, seizes on the stick within its reach. But soon afterwards the infant learns to make an incipient vacuum in its mouth, and by removing the pressure of the atmosphere from the nipple, it acts exactly like a pump. Thus, man hardly born, becomes a natural philos-

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Pestalozzianism meant a pedagogy which, supported by a psychology allegedly based on scientific investigation,[50] gave precedence in education to doing rather than reading, to the study of 'things' rather than 'words,' of natural phenomena rather than language. Concomitantly (for the consistent reasoner), it involved a more or less firm belief in freedom of expression for the pupil--a belief, the

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«Footnote 49, contd.»

> opher; why then should not my pupils endeavor to be acquainted with natural philosophy?

He deems natural history, "of all our arts and sciences," to be "unquestionably the best and most convenient means" by which "the natural faculties of the growing man should be gradually brought to their maturity." Ibid., p. 85.

[50] Pestalozzi was himself not consistent with regard to the means of ascertaining the 'true constitution of the child mind.' At times it would appear that he assumes intuition, or a natural sympathy of some kind, to be the source of understanding of the pupil's mind. At other times he is clearly the experimentalist, proceeding inductively. At one time he speaks of "my way of experiments, which is the way of my life." At another time he declares:

> The mechanism of physical «human» nature is essentially subject to the same laws as those by which physical Nature generally unfolds her powers.

(Note that the editor of the U. S. Literary Gazette in 1825 «I, 372» speaks indiscriminately of "the inductive, analytical, Baconian, or Pestalozzian method of instruction.") And yet, Pestalozzi himself speaks of following the impulses of his heart towards the truth in education - even describes himself, in Rousseauian fashion, as tossed by passions for truth and justice and feeling like an "uprooted reed upon the waves of life." How Gertrude Teaches, pp. 25-34, 131-132. Nor should we forget that sentiment and the mother's heart are shown, in Leonard and Gertrude, to be the foundation of a good education - together with quiet industry, "a silent worship of God and love of humanity." Ibid., p. 156. Piety, utility and sentiment (usually projected in philanthropy) constituted the three pillars of Gertrude's pedagogy.

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sentimental corollary of the scientific, in the goodness and self-sufficiency of that which is nature's way.

The Academician in 1819 prophesied that the "system of mental culture, industry and economy," which had been "brought to perfection" by Pestalozzi and Fellenberg, would, "when known in all its details to the American people, ... be embraced and adopted in all places of systematic education."[51] Toward the end of the century an American editor of How Gertrude Teaches could write:[52]

> Pestalozzi foresaw, on its first morning, when he began How Gertrude Teaches, the nature of the coming century: 'The whole earth the beauty wore of promise.' We have entered into it. From Wordsworth's Prelude, 'dedicate to Nature's self and things that teach as Nature teaches,' written at exactly the same time, and in the same spirit, as How Gertrude Teaches, to our latest schemes of technical education, we have been thinking and working in the same ways, with but little of his direct influence. Education generally; the doctrine of development; the culture and knowledge of the body, practically by exercise, theoretically by physiology; science and art, both included in his elementary means...; the training of teachers, based on psychology; our social schemes for the welfare of the people--are all and more to be found in this work.

Pedagogical naturalism, as well as unimpeachable morality, also came to America in the writings of Maria Edgeworth and her father. The nation's press faithfully

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[51] I, 341.

[52] Ebenezer Cooke, in preface to 1898 edition, pp. 2-3.

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issued their works during the early decades of the century, and periodicals lauded their endeavors as evidence of the enlightenment of the age.[53] Even the United States Senate heard tribute paid to Maria as that "delightful, ingenious, charming, sensible, witty, inimitable, though not unimitated Miss Edgeworth."[54] And Jefferson exempted her novels from his condemnation of that literary genre.[55] The educational

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[53]We read in the Analectic Magazine, X (1817), 353:

> The literary merit of the Edgeworth family generally, and the successful efforts of Maria Edgeworth in particular, to promote pure morals and engaging manners, by means of the most popular species of literary composition, have rendered the name interesting to modern readers of almost every description. The mechanical experiments of the father - the joint treatise of the family, on practical education - and the lively descriptions of character and manners, the plain and practical morality, the useful as well as the amusing tendency of Miss Edgeworth's novels, - have given to the family a title to notice...

And in the AJE, I (1826), 291 (critical notice of Harry and Lucy, Concluded):

> To praise any of Miss Edgeworth's attempts would be idle. The American public has long since assigned her one of the highest places among the friends of parents and of youth.

Cf. also review of Edgeworth's Practical Education, New York, 1835, under the title "Richard Lovell Edgeworth" in N. Am. Rev., XLII (1836), 148-160.

[54]Spoken by John Randolph, February 1828, and quoted under the heading, "John Randolph and Miss Edgeworth," in So. Lit. Mess., III (1837), 725.

[55]Suggesting a plan of "female education," Jefferson wrote to Nathaniel Burwell in 1818:

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theory of the celebrated lady and her father, followed by "countless households," and "practised on ... friends and youthful cousins,"[56] was compounded of the creed of induction, Godwinian associational psychology, utilitarianism and sensibility. The pages of their Practical Education quoted Rousseau, Mme. de Genlis and 'Dr. Darwin,' as well as Bacon, Locke and Godwin. Father and daughter began with the announced principle that "to make any progress in the art of education, it must be patiently reduced to an experimental science."[57] And the rest of their work followed a pattern already familiar. The 'Natural laws of mind'

«Footnote 55, contd.»

> A great obstacle to good education is the inordinate passion prevalent for novels, and the time lost in that reading which should be instructively employed. When this passion infects the mind, it destroys its tone and revolts it against wholesome reading. Reason and fact, plain and unadorned, are rejected. Nothing can engage attention unless dressed in all the figments of fancy... The result is a bloated imagination, sickly judgment, and disgust towards all the real business of life. This mass of trash, however, is not without some distinction; some few modelling their narratives, although fictitious, on the incidents of real life, have been able to make them interesting and useful vehicles of a sound morality. ... Such are the writings of Miss Edgeworth, and some of those of Madame Genlis.
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> Writings, XII, 91.

[56] Van Wyck Brooks, The Flowering of New England, 1815-1865 (New York, 1936), p. 71.

[57] Maria Edgeworth and Richard Lovell Edgeworth, Practical Education (London, 1798), I, Pref., p. v.

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gave them the "basis of ‹their› plan of education": that "we should associate pleasure with whatever we wish that our pupils pursue, and pain with whatever we wish that they should avoid."[58] Throughout, the Edgeworths are guided by the idea that if pleasurable sensations are associated with the learning process, education will be more efficient and more salutary. Behind this, of course, lay the naturalistic assumption that the way of nature, unchecked, was purposefully good, beneficent.

Conveniently, the 'laws of mind' had been arranged with such benign foresight, that the content of education most 'natural' for youths, hence that producing the strongest association with pleasure, is scientific and practical. Thus does nature's law ordain a Baconian curriculum. To teach the physical sciences is to go along <u>with</u> instead of <u>against</u> the 'natural' tendency of children, who come into the world blessed with a rich fund of curiosity about external nature. Utilizing this 'natural' disposition, implanted for the purpose of their development, the educator will be automatically preparing men and women for the brave new world: men and women equipped to maintain and extend man's dominion over nature. "When a pedantic schoolmaster," we read in <u>Practical Education</u>,

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[58] <u>Ibid.</u>, II, 713.

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> sees a boy eagerly watching a paper kite, he observes, 'What a pity it is that children cannot be made to mind their grammar as well as their kites!' and he adds perhaps some peevish ejaculation on the natural idleness of boys, and that pernicious love of play against which he is doomed to wage perpetual war. A man of sense will see the same sight with a different eye; in this pernicious love of play he will discern the symptoms of a love of science, and, instead of deploring the natural idleness of children, he will admire the activity which they display in the pursuit of knowledge. He will feel that it is his business to direct this activity, to furnish his pupil with materials for fresh combinations, to put him, or to let him put himself, in situations where he can make useful observations, and acquire that experience which cannot be bought, and which no masters can communicate.[59]

And the Edgeworths were able to point out that such an ideal relationship between master and pupil was recommended long ago by Lord Bacon himself.[60] Further, children are to

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[59] Ibid., I, 18-19.

[60] They remind their readers of the applicability of Bacon's criticism, and quote him:

> 'For as knowledges are now,' says Bacon, 'there is a kind of contract of error between the deliverer and the receiver; for he that delivereth knowledge, desireth to deliver it in such a form as may be best believed, and not as may be best examined; and he that receiveth knowledge, desireth rather present satisfaction than expectant inquiry; and so rather not to doubt, than not to err; glory making the author not to lay open his weakness, and sloth making the disciples not to know his strength.'
>
> Quoted Ibid., I, 116-117.

Over thirty years later, a contributor to the American Journal of Education, reviewing a new edition (London, 1825) of the Advancement of Learning, also saw fit to quote the same passage from Bacon, adding the latter's next remark:

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be encouraged to read the papers of the Manchester Society, Franklin's letters, Priestley's and Percival's works, wherein "may be found a variety of simple experiments which require no great apparatus, and which will at once amuse and instruct." They should be given little cabinets for the study of natural history, and "cheap microscopes, which will unfold a world of new delights."[61] Indeed the very toys of children must be 'rational':[62] the young are to be formed Baconians from the cradle; and so formed, be more natural, more rational, more moral. Not that the emotional life of the child is to be ignored. Sensibility is always of moment to the Edgeworths. They are not willing to concede as adequate motivation to moral action, the association

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«Footnote 60, contd.»

> 'But knowledge, that is delivered as a thread to be spun on, ought to be delivered and intimated, if it were possible, in the same method wherein it was invented, and so is it possible of knowledge induced.'
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> IV (1829), 136.

[61] Ibid., I, 28-31, 339-341. The "Early Lessons" series were intended by the Edgeworths "to entice young people to the study of the mechanic contrivances and scientific apparatus, which are commonly classed under the head of useful inventions." AJE, I (1826), 191. Herein was always the emphasis of the Edgeworths: natural pedagogy and that which was demanded by the natural - scientific and technological knowledge. Even grammar, they held (as did all Pestalozzians), should be taught by the 'natural' method instead of 'the old unpleasant method of forcing grammar down the throats of school children.' Practical Education, II, 387-417.

[62] Ibid., I, 1-35.

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of pleasure with virtue, and a mere cold calculation of degrees of pleasure derivable therefrom. No, the cold estimate of returns in pleasure can never evoke our sympathy for generous action, as can simple enthusiasm for doing good to others. Natural impulse, depended upon for the will to beneficent knowledge, is also depended upon for the will to beneficent action! Again Bacon is given Rousseau's heart.[63]

It has already been indicated that the naturalistic views of Pestalozzi and of the Edgeworths evoked enthusiasm and won followers among American educators. The Baconian mind embraced its own image--projected its own image.[64] The task was assumed of promulgating the new pedagogical gospel with its mingling of pragmatic, utilitarian and sentimental creeds. Again and again we encounter the fundamental principles, repeated with a catechetical sameness: that there is nothing in the mind not first in the senses; that the senses are most keen, most active in the young; that consequently the young must first be taught 'things.'

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[63] Ibid., I, pp. 227-298.
A minor Maria Edgeworth, Mrs. Elizabeth Hamilton, was also known in America. Her Letters on the Elementary Principles of Education attained a third American edition at Boston in 1825.

[64] It cannot, of course, be claimed that American education needed these precise sources of influence in order to have taken its naturalistic direction.

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This, the 'natural mode' was contrasted with the traditional subjection of children at the very outset to abstractions, to the memorizing of 'mere words' and 'dogmatical principles.' Educators in the brave new world would know better. They would discard the traditional--which have been the ways of ignorance. Knowing that the world was meant to progress, and that this progress depended not upon the inculcation of alleged eternal verities but upon experimentation and induction, they would embrace the new pedagogy and advance it by the same means.

Those who had already embraced it propagandized widely for the 'procedure that follows the natural unfolding of the mental powers'--from the known and specific to the unknown and abstract. Textbooks began to court favor by presenting themselves as organized "upon the inductive method of instruction" or "in the spirit of Pestalozzi's method."[65] Daniel Webster himself caught up the Pesta-

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[65]One of the earliest of these textbooks published in America was Warren Colburn's First Lessons in Arithmetic on the Plan of Pestalozzi (Boston, 1821). Colburn brought out other arithmetics and an algebra "upon the inductive method of instruction," and interestingly enough, graded "Lessons in Reading and Grammar" which were "chiefly from the works of Miss Edgeworth" (all published during the second and third decades of the century, at Boston). There was published at Salem in 1825, from the London edition, a Hints to Parents... in the Spirit of Pestalozzi's Method; and there even appeared a Pestalozzian Primer by one John M. Keagg, M. D., Harrisburg, c1827. William C. Woodbridge, at the American Institute of Instruction in 1833, recommended

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lozzian refrain and complained:

> We begin with the abstracts, and know little of the detail of facts; we deal in generals, and go not to particulars... Teachers should teach things.[66]

Even teachers of the classical languages, whose position was being undermined by the "spirit of Pestalozzi," were altering texts expressly to accord with this basic tenet of the schoolmaster of Yverdun.[67] As early as 1819 the

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«Footnote 65, contd.»

the inductive method in the teaching of geography. "On the Best Method of Teaching Geography," American Institute Lectures, 1833, pp. 209-240. Praise of the method for various subjects came from the American Journal of Education, I (1826), 166-169. Cf. also J. G. Carter's advocacy of S. R. Hall, Lectures on School-Keeping, pp. 39, 89, 96. Hall notes (p. 82): "What I recommend in this and in several previous directions, appears to have been achieved by Pestalozzi."

[66] Writings and Speeches, XIII, 104-105. This opinion was voiced by Webster in 1838 at a meeting of the Plymouth County Association for the Improvement of education.

[67] Cf. AJE, IV (1829), 249 - in a review of Walker's New Latin Reader:

> We are happy to learn that the natural and philosophical mode of teaching language - the method which places the facts of language before the theory, in the order of instruction - the method recommended by Locke ... is rapidly making its way in this country...

Note also, Charles D. Cleveland, First Lessons in Latin, upon a New Plan; Combining Abstract Rules, with a Progressive Series of Practical Exercises, Boston, 1829.

Professor Alpheus S. Packard of Bowdoin College, in an address before the American Institute of Instruction in 1833, recommended the inductive method in the teaching of ancient languages. "On the Best Method of Teaching the Ancient Languages," American Institute Lectures, 1833, pp. 153-184.

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Academician, in an abstract of Jardine's Outlines of Philosophic Education, was advocating that teachers adopt the 'great principle of Bacon and Pestalozzi,' whereby "we approach more nearly to the method dictated by nature" and men are restored "to the clear light and unfettered liberty of nature."[68]

The follower of the 'philosophic mode' saw in it the promise of the future, derogated Aristotle,[69] eschewed mere training of memory, scorned 'metaphysical subtlety' and frequently attacked the study of Greek and Latin. In order to fit his teaching to the capacity and disposition of his charges he turned first to tangibles--which meant turning to the phenomena of the universe and to the useful arts which utilized and demonstrated scientific principles. Thus science applied to education resulted in greater emphasis upon science. Scientific investigation having ostensibly demonstrated that man learns through his senses: that, properly, he forms general principles upon the data of particular sensory experience--the lesson for pedagogy was quite clear. It is reflected in the view expressed by the Literary Gazette that, as "belongs to the spirit of the age,"

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[68] I (1819), 387, 340-341.

[69] Ibid., p. 337.

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> ... all the improvements in our system of education have a primary reference to this object--to remove from the learner the necessity of taking any thing upon authority, and to enable him to understand definitely all that he is required to believe.[70]

It is reflected in John Griscom's dictum, proclaimed before the American Lyceum in 1832, that schools should"be made attractive and delightful ... for it is evidently a law of our being, that we can, and do, from infancy to old age, pursue most successfully those objects which yield us pleasure in the pursuit."[71] It is found in an American Institute of Instruction prize essay, which urged "nature's method" against "charging the memory with words."[72] It is reflected in the Peter Parley books, where a lesson in astronomy may begin with a balloon ascension to demonstrate that the sun and the moon need not be deemed only as large as they appear.[73] And it is reflected likewise in the promise of William Russell that the American Journal of Education, dedicated to "the advancement of explanatory and practical instruction," would consider it

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[70] I (1824), 184.

[71] "School Discipline" ("Essay on School Discipline, Read before the American Lyceum, May 5th, 1832"), reprinted in American Annals of Education, VII (1832), 483.

[72] T. H. Palmer, Teacher's Manual, pp. 14-16.

[73] Samuel G. Goodrich, Peter Parley's Tales about the Sun, Moon, and Stars (Philadelphia, 1833), pp. 9-18. Goodrich was the author of 84 school textbooks and juvenile reading books. Cubberley, Public Education, p. 298 n.

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> necessary to regard as defective such books as adhere to the inculcation of what is unintelligible, or of what is never to be brought into actual use.[74]

Recurrent in the pages of the Journal is the argument that instruction should proceed inductively according to nature's plan and that this plan decrees pre-eminence for the study of natural phenomena. One writer, enthusiastic over "visible instruction" as the proper basis for the development of ideas, confidently grounds his thesis on the premise that "every child, in his earliest infancy, is a natural philosopher."

> He experiences the most intense delight, in his endless and endlessly varied experiments to ascertain the nature or properties of objects around him, and of the laws which govern them. The whole circle of the sciences is examined and relished, to some extent, by children; and the examination is commenced at a very early period. The experiments tried by them, in chemistry, mechanics, hydrostatics, pneumatics, optics, botany, mineralogy, etc., are innumerable, and all calculated to give them the knowledge which they most need, and which they constantly use in their daily pursuits in life.

And yet, regrettably,

> the most unfortunate impression exists to a great extent, that the learning of letters, spelling, reading, writing, etc., are the most important, if not the only important subjects to occupy the attention of young children; and that the sciences, or the laws and works of nature, are above their comprehension, and not fitted for their use.

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[74] "Prefatory Address," II (1827), 12.

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Although precisely the reverse is true, judged by the constitution of the child and the requirements of utility. Indeed, "a mere glance" of the eye "will do more than a course of reading and study for weeks or even months." "If any person will inquire," the writer concludes,

> ... through what organ impressions are made upon the minds of children, most rapidly, distinctly, permanently, and agreeably, what kind of knowledge they are in infancy most eager to obtain, and what they have the most frequent and important occasions to use in the daily and ordinary pursuits of life, he must be ready to acknowledge that apparatus, and specimens to explain the laws and the works of creation, are an essential appendage to every school room and every nursery.[75]

In the same year (1829) the Journal reprinted "Letters of Pestalozzi" from the Paris Journal of Education and Instruction,[76] and also, from the long defunct Academician, an account of Pestalozzi's method, wherein the inductive approach is heralded as the foundation of morality. By the inductive method, we read,

> truth is ... identified with physical certainty, and morals are aided by a common reference to sensible things. Morals gain strength by association with the truths of numbers, of geometry, and the peculiar lines which characterize and distinguish forms of sensible things. That one and one make the number two, is a truth, as much as that virtue and sincerity are admired and beloved; and that a circle is round, the properties of angles constantly the same, though every angle

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[75] "Apparatus for the Instruction of Children," IV (1829), 62-64.

[76] Ibid., pp. 414-432, 548-555.

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> that varies from another, is not similar to that which differs.... In this way a devotion to truth is indulged. ... the grossness of falsehood is avoided.[77]

Thus to the other values ascribed to the inductive method is added the merit of moral discipline. At the same time the Journal carried the praises of other works that fostered the instruction of the young 'according to the natural tendencies and development of the human mind.'[78] One reviewer, for example, recommending Arnott's Elements of Physics as "a book which we should be happy to think was in the hands of every teacher," justified his endorsement with Pestalozzian psychology quoted from Arnott's preface:

> 'Every man may be said to begin his education, or acquaintance of knowledge, on the day of his birth. Certain objects repeatedly presented to the infant, are after a time, recognized and distinguished. The number of objects thus known gradually increases, and, from the constitution of the human mind, they are soon associated in the recollection, according to

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[77] Ibid., p. 103.

Cf. Griscom, Year in Europe, I, 399:

> But the greatest recommendation of the Pestalozzian and Fellenberg plan of education, is the moral charm which is diffused throughout all its operations. It cannot but happen, (all other things being equal,) that pupils thus educated, will become not only more intelligent men and better philosophers, but also more moral and dignified members of society. I cannot but cherish the hope, that this scheme of education ... will be speedily and extensively adopted in the United States.

[78] "Early Education," IV (1829), 158-166.

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> their resemblances or obvious relations. Thus, sweetmeats, toys, articles of dress, etc. soon form distinct classes in the memory and conceptions. At a later age, but still very early, the child distinguishes readily between a stone or a mineral mass, a vegetable, and an animal; and thus his mind has already noted the three classes of natural bodies, and has acquired a certain degree of acquaintance with natural history. He also soon understands the phrases 'a falling body,' 'the force of a moving body,' and has therefore a perception of the great physical laws of gravity and inertia. Having seen sugar dissolved in water, and wax melted round the wick of a burning candle, he has learned some phenomena of chemistry. And having observed the conduct of the domestic animals, and of the persons about him, he has begun his acquaintance with physiology and the science of the mind. Lastly, when he has learned to count his fingers and his sugar plums, and to judge the fairness of a division of a cake between himself and his brothers, he has advanced into arithmetic and geometry. Thus, within a year or two, a child of common sense has made a degree of progress in all the great departments of human science, and, in addition, has learned to name objects and to express feelings, by the arbitrary sounds of language.'[79]

Every man a pragmatist and his own authority--from the cradle! William Woodbridge brought the naturalistic doctrine to the New York Convention on Education in 1830. "Let knowledge be given," he explained,

> in the time, and measure, and manner, in which the mind can receive it, and it would generally be welcomed. The fundamental error in our system seems to me to be, that we require the child to attend to subjects he cannot comprehend, and punish him for his want of interest in them. An insect flies across the school room, which

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[79] Ibid., pp. 160-161.

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> exhibits a world of wonders and beauties in itself adapted to his capacity and age, but he is punished for gazing at it, and compelled to fix his eyes on the book before him, which is often from the nature of the subject, and still oftener from the manner in which it is treated, entirely beyond his capacity.[80]

The new pedagogy 'on philosophical principles' was seen by one writer for the Literary Gazette as part of the fruit of the whole scientific movement. "It is a striking characteristic of the present age," he writes,

> that men are unwilling to believe any thing on authority; it must be explained and illustrated so that it can be understood. The mind revolts from a dogmatical mode of teaching. We love to feel that we are free and rational agents, as well while acquiring, as while using, knowledge.

The work of Pestalozzi has not alone conduced to this effect.

> All the causes which have combined to produce this character in the present age, have tended equally to introduce that method of instruction which Pestalozzi has done so much to illustrate and recommend. The Reformation, the works of Bacon, of Newton, of Franklin, and many others, and all that has been done to encourage and cultivate experimental science, have contributed to the same end.

"The tendency of the whole," he adds,

> is to abolish the system of dogmatical teaching, and to substitute for it a system of learning,--a system by which the scholar shall, at all times, have that presented to his mind which he is capable of comprehending, and of applying to some use. This is the way in which all real knowledge is obtained, and it is because our ele-

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[80] Journal of the Convention, p. 11.

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> mentary books and our common modes of instruction are so imperfect, that so very little is done at school to improve any other faculty of the mind than memory.[81]

Taking a general view of the educational scene, and with the same faith, the Reverend John Russell, in his address on the study of natural history, sees a brighter picture. "The sagacity and combined efforts," he declares,

> of the philanthropic and of the physiologists of mind, if I may be allowed such an expression, have already done much towards a just appreciation of the subject. We must hail with delight the improvement which we daily and hourly see introduced into our schools; as also the tendency of such efforts towards a correct education. Facts are beginning to be more appreciated in their connection with principles, and theory when associated with practical truths. The young mind is now led by analyses and personal observation to certain results. The ingenious 'why

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[81] I (1825), 345. The writer is reviewing Solyman Brown's A Comparative View of the Systems of Pestalozzi and Lancaster (New York, 1824), from which he quotes the opinion that Pestalozzi's system is one in which

> 'books are introduced only to embody the elements of science, and where able teachers are employed to illustrate, to amplify, to infer; to elicit thought and excite reflection; to encourage inquiry and engage curiosity; to teach practice and explode theory, either things themselves are presented directly to the senses, or their appropriate ideas are excited in the mind, by the aid of analogous images already there, and the mere words which signify the one and the other, follow of necessity. In this case we secure the reality, instead of the transient shadow which flits across the mind only to leave it in greater darkness and more deplorable sterility. In short: the one system imparts ideas, and the other words.'
>
> Loc. cit.

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> and wherefore' is expected and sought instead of the mere assumption. The youth is recognised as a reasoning being, instead of the curious, but almost artificial machine. He is, or may be the younger companion of the master, treading together the delightful path of science for a mutual investigation of truth.[82]

Others connected the psychological rationale of the educational reformers more particularly with science and the practical needs of man: insisted upon the adaptation of the curriculum to the way in which mind functions. Thus the Journal of Education recommends the Juvenile Philosopher as "a convenient and cheap manual relating to the elements of natural science," and adds:

> That these subjects ought to be more generally studied, must be evident to all who consider the peculiar aptitude of most children and youth to examine the objects of nature, and investigate her operations; who consider the importance of early habituating youth, not only to be accurate observers of facts, but also to reflect on what they observe; to reason and judge correctly....[83]

Since, repeats one Boston Pestalozzian teacher, there is nothing in the mind that was not first in the senses, and natural phenomena are the sources of influence upon both mind and heart--influence of a most salutary kind--what more natural and beneficial upon which to base education?

> Natural history presents many objects, that exercise the affections, and improve the mind of a child. The blooming flower, perfum-

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[82] Op. cit., p. 74.

[83] I (1826), 636.

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> ing the air, and playing in the breeze, engages his attention. He is curious to feel it, smell it, taste it, and pull it to pieces. The insect, that flutters, hums and lights on its leaves, sips its nectar, and pilfers its silken petals for the canopy of its offspring, is an object of delight to the child. He is amused with its labours, and inquisitive to know its history. The mineral too has its charms. Open to him a cabinet of minerals.... He is full of inquiry and curiosity.... Such observations entertain the young mind, and furnish it with subjects of useful knowledge. They tend, likewise, to form a taste for physiological, and philosophic studies, and, by engaging the mind on subjects, that instruct and please it, without exciting any of the bad passions, tend to form the virtuous character.[84]

The Reverend Orville Dewey, observing that nature offers more attractions than mere utility, is impelled to conclude, in a pious frame of mind:

> It is as evident that the world was made to display to its inhabitants the wisdom, as the goodness of its Creator. It is reasonable, therefore, that they should study it. No inquiry could be more proper for men, and for all men.[85]

"And who can doubt," exclaims another,

> ... that Providence designed--<u>particularly designed</u>, that these wonders which he has scattered all around us in such abundance, while he has given us faculties for understanding and admiring them, should become objects of special study, and a source of pleasure, as well as of profit?[86]

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[84] M. Windship, <u>Thoughts on Education</u> (Boston, 1831), pp. 3-8.

[85] "Diffusion of Knowledge," <u>N. Am. Rev.</u>, XXX (1830), 298.

[86] L. Parsons, <u>op. cit.</u>, p. 10.

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To William Seward an education that does not proceed on the basis of scientific observation of phenomena is characteristic of the dark ages, when

> whatever was simple and easy of apprehension, was thought unworthy to be known, and the philosophy which explains the formation of the earth, and its perfect adaptation to the subsistence and happiness of our race was not then conceived.

"Something of this strange error still remains," he charges,

> but a change has commenced, and we may soon hope to see a system of education which will lead the mind by an easy and natural process through the truths of external nature, to the mysteries of mind, and the study of the Supreme Author.[87]

A persistent teleology still preserved the alliance of science and religion. Nor did apprehension of the dissolution of God in nature seem to stir in the consciousness of such pious Baconians as Seward, Griscom, Dewey, George Emerson, and Francis Wayland.

As was to be expected, conventions of the American Institute of Instruction brought forward persistent echoes of Pestalozzianism. At the Institute's first meeting (1830) Francis Wayland held out the promise of a future world of superior men and women, as soon as teachers had recognized that children 'learn by doing' and that

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[87] Works, III, 173.

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education must be based upon the inductive method.[88] Also at this first meeting Walter Johnson, as if fresh from a study of How Gertrude Teaches, advanced his belief in the power of "linear drawing" to foster "mental power, moral feeling, delicate taste, and correct knowledge." These, the proper ends of education, he assures the members of the Institute, are to be attained primarily by the training of observation. And what can better exercise the powers of observation than "linear drawing"? On the basis of Lockean sensationalism, Johnson is confident that an educational method which begins with examination of "sensible objects" and "renders these distinctly intelligible, and easily remembered, contributes, in an eminent degree, to promote the great aims of all rational instruction."[89]

In 1931 two speakers carried to the Institute the message that man, being what he is, is made for the study of nature. "His senses were given him," said one,

> to be the ministers of thought and feeling, between the world within and the world without. It is the office of education to regulate this influence, to determine whether this child shall be the gloomy savage, or the enlightened philosopher.

And this is to be achieved by teaching "a knowledge of things rather than of words"--by studying "nature in her

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[88] Introductory Address before the American Institute of Instruction, pp. 12-19.

[89] "On linear Drawing," American Institute Lectures, 1830, pp. 259-261.

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own livery."[90] The same general principles received full exposition by William Brooks of Salem. "The senses are the nursing mothers of the mental powers," proclaimed Mr. Brooks. Indeed, the very soul of man has been designed for drawing nourishment, through the senses, from the natural world.

> If the Deity have created the universe partly or wholly for the education of the human soul, he has completed his plan by giving to the soul the senses to act as its instruments in receiving that education. Accordingly the various sciences which are and have long been used for developing the intellectual powers, are based upon the intercourse which the mind through the senses holds with the material universe.... All the sciences, founded upon the action of the senses, can be understood only through the senses. Books serve to tell and explain what great study and genius have learned. But the only way in which a science can be practically and well understood, is that of mingling with the study of books a sufficient leaven of original observation, and experience to imbue the whole with life.

"We deal too much in abstractions in our schools," he complains,

> both for young and old. The senses are not sufficiently used; yet theirs is the evidence most satisfactory to boys' minds as well as ours. In astronomy, the boy studies a treatise, and, as the word goes, learns it. But he does not learn it, that is, he gets no practical knowledge, and comparatively little useful discipline. Let him use his eyes. Let his first lesson be in the open volume of the skies.... Follow the same principle in the other sciences.... The apprentice and the student both want the practice as well as the theory, and the practice rather than the theory.

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[90] C. Durgin, op. cit., pp. 215-216, 217-218.

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"How stiff and cramped a thing is a mere book-education!" he exclaims.

> As learning once secluded itself in the monasteries, so now, not always, but too generally, it retires into the school-house eschewing the senses, its natural and most thorough means of education, and grows mystified and confused with poring over abstract ideas alone.[91]

He advocates, accordingly, not only an education conducted scientifically, but one directed towards the need of an active, workaday life. Such an education must be built upon the study of things; more precisely, upon the study of nature and the ways in which man gives empire over it.[92]

The following year the Institute heard John Pierpont--he of the "Normal Readers" and the poems celebrating daedalian progress--declare his conviction that the study of nature is particularly suited to the young, because, although not capable of grasping abstractions, they do show interest in and can comprehend "sensible objects."[93] Accordingly, the Reverend Pierpont's "Readers" contained such selections as "Lectures on Natural History: the Horse"--and, from Mrs. Sigourney, "The Rose."[94] For senti-

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[91]"On the Education of the Five Senses," American Institute Lectures, 1831, pp. 110, 119-121.

[92]Ibid., pp. 117-119.

[93]"On the Moral Influences of Physical Science," American Institute Lectures, 1832, pp. 95-96.

[94]Cf. Introduction to the National Reader; a Selection of Easy Lessons, Designed to Fill the Same Place in

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mental and scientific naturalism are seldom apart in Pierpont.

In 1834 Dr. Augustus Gould proclaimed before the Institute:

> I would have children study no books but nature's own book. I know that it is not necessary for every one to go over anew the whole process of discovery, which others have previously painted; the very purpose of books and improvements in education would then be nugatory, and we should be making no advance in science. But you will perceive my meaning to be, that the time of early education should be given to observation, and the acquisition of facts by observation, which shall be delightful and useful throughout life; and that it should not be spent in the fruitless exercise of laying up words without ideas.[95]

Hence the value of natural history:

> As a mental exercise, it is well adapted for the attention of youth. The mind is not obliged to dwell upon abstract propositions, but there is something tangible for it to operate upon. It is addressed to their senses, and tends to perfect them, by exercise in the repeated observation of form, color, order, size, &c., while at the same time, the mind is naturally brought into exercise in the act of comparing and judging, and in attempts to deduce the final causes of all the diversity witnessed.[96]

Suspicion of abstract learning even penetrated, if for one brief moment, the pages of Washington Irving. For

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«Footnote 94, contd.»

the Common Schools of the United States, that Is Held by Murray's Introduction, and the Compilations of Guy, Mylius, and Pennock, in those of Great Britain (Boston, 1843), pp. 17-22, 26-27.

[95] Op. cit., p. 240.

[96] Ibid., p. 228.

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we read in that fragment of an abortive novel,[97] "Mountjoy," of how an excessively imaginative young hero was advised by a sage elder to turn his attention "to the physical rather than the moral sciences," since

> these studies store a man's mind with valuable facts, and at the same time repress self-confidence, by letting him know how boundless are the realms of knowledge, and how little we can possibly know. Whereas metaphysical studies, though of an ingenious order of intellectual employment, are apt to bewilder some minds with vague speculations.[98]

And William Peabody would agree; for he too conceived the mind to have--especially in the young--a natural affinity for the study of natural objects. "There are," he wrote in the North American,

> too many studies, which their minds play upon,--perhaps work upon, while they are dealing all the time with words and not with things. 'Words,' it has been said, 'are the daughters of earth; things are the sons of heaven;' but in many studies, the mortal claims and receives what belongs to the immortal. The observation of children needs to be cultivated more than the memory; the habit of remembering is in great part mechanical and easily brought to perfection; the habit of observing with the mind open as well as the eye, is not so easily formed; but it is so important to all kinds of success in later years, that the sci-

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[97] The projected novel, Rosalie (never completed). Stanley T. Williams, Life of Washington Irving (New York and London, 1935), II, 324.

[98] Wolfert's Roost and Other Papers, Now First Collected (New York, 1855), pp. 97-98. Although composed in 1818, this fragment was published for the first time in 1839, in the Knickerbocker Magazine, XIV, 402-412 (and subsequent issues).

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> ence which will do most to form it in the young, carries with it its own recommendation. We think that Natural History will be found, more than any other, to fasten itself upon the mind, and to give a cheerful excitement to all its powers.[99]

In brief, then, we find the Baconian mind endeavoring early in the century to impress its features upon education. Faith in science and technology as the foundation of progress was inevitably extended to the culture of the individual; for it was in education that the seeds were to be sown: the school was expected to produce the men and women who, in turn, would bring into being the brave new world. They would do this by mastering nature and controlling man through science and technology; they would do it by ennobling the race through the salutary physical, intellectual and moral influence directly derived from the pursuit of science; they would do it by applying scientific principles

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[99] "Study of Natural History," XLI (1835), 406-430. Cf. in addition: A. R. Baker, op. cit., pp. 267-287; D. D. Barnard, Lecture before Young Men's Association, pp. 21-23; C. E. Beecher, Suggestions, pp. 12-15; "Doctrine of Temperaments," Am. Quar. Rev., V (1829), 118-119, 142-143; T. H. Gallaudet, Address on Female Education, AJE, IV (1829), 213-225; A. Partridge, op. cit., p. 268; "Thoughts on Primary Education," AJE, IV (1829), 385-395, 481-497; U. S. Rev. and Lit. Gaz., I (1826), 132-133; U. S. Lit. Gaz., III (1826), 241-245.

The plan that became the foundation for the Rensselaer School constitutes a complete outline of the modernist vision of a sound pedagogical method. This plan has been ascribed to Amos Eaton, the botanist. Cf. Ethel M. McAllister, Amos Eaton, Scientist and Educator, 1776-1842 (University of Pennsylvania Press, 1941), pp. 364-365.

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to pedagogy itself. Thus through education was to be realized the promise of the material and human sources for the splendid future: man would emerge with empire over physical creation, with greater power for good over his own being, with intellect expanded and spirit elevated--his true stature attained, head amid the stars, feet lightly treading the brave new world. Christ and Bacon had spoken!

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CHAPTER IV

Literature and the 'Hard Temperament'

Of course, it is not suggested here that in the first part of the nineteenth century America underwent a sudden and complete conversion to Baconianism. True, the movement was strong, and the future belonged to it. But not all men were (or are) Baconians and neither were (nor are) all Baconians completely Baconian. Man is nothing if not inconsistent. We are dealing with social and intellectual tendencies. Hence the present chapter, while examining the Baconian mind principally in relation to humane letters, must also serve as qualification. It will be necessary to point out here that the representative Baconian was not without opponents when, impelled by his veneration for 'facts' and his utilitarian standards, he assailed the old foundation of human culture in the linguistic and philosophical disciplines. And, further, it will have to be noted that Baconians themselves often preserved a certain loyalty to these traditional disciplines (if recognizing in them, for the most part, no more than 'polite learning' to adorn). The 'hard Baconians and those who retained belief

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in the humanizing power of literary studies joined in conflict principally on the issue of the status of the ancient classics; for the classics were the pre-eminent symbols of the imaginative, the aesthetic, and whatever could be of value out of the past of man. They seemed to constitute the foremost challenge to the Promethean faith with its belief in the power of 'facts'; and they did dominate education.

The optimistic pronouncements of early nineteenth-century Baconians frequently adumbrate the modern worship of 'facts.' To Baconians the promise of the inductive method was, obviously, the promise of 'truths' to be disclosed by its application. 'Facts' were the bricks for the new and glorious edifice. Not to mention that the 'facts of nature' were significant in themselves. On the other hand, abstractions or 'mere metaphysics', served only to obscure the truth; their proper environment was the Dark Ages. An enlightened era was one that understood the kind of knowledge which is truly power. Charles Ingersoll noted with admiration, as a token of America's intellectual progress, that "five hundred thousand dollars was the capital invested in one edition of Rees' Cyclopedia."[1] The kind of knowledge which was to promote 'the march of mind' consisted for the

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[1] Influence of America on the Mind, p.18.

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Baconian of such things as filled the pages of "Philosophical Transactions, and elaborate works of science".[2] "Facts," declared James Carter, "are the materials of philosophy. And we cannot philosophize, safely, till we have an extensive stock before us."[3] Collect facts, the Honorable Benjamin Tappan exhorted the Ohio Historical and Philosophical Society in 1835, --that is your business, your value and your glory.[4] To make possible the co-operative storing of data was the recognized function of philosophical societies.[5] Medicine, it was pointed out, advanced only with due appreciation of the importance of 'facts' as the basis of induction.[6] The Pestalozzian endeavored to ground education on 'facts' and the study of 'things.' Through the lessons of Peter Parley and the exploits of little

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[2] "Diffusion of Useful Knowledge," Christian Examiner, VI (1829),81.

[3] Essays upon Popular Education, p. 58.

[4] Op.cit.,pp. 14-18, 21-29.

[5] Thus Stephen Elliot, addressing the South Carolina Literary and Philosophical Society in 1814:

> [The] task [of such societies] has been to collect the stone, the mortar, and the block, with which the future architect may rear his edifice, and like the workmen of the quarry, although their individual labours may be unnoticed or hidden in the finished structure, yet, have they, nevertheless, essentially contributed to its solidity or magnificence.
>
> Address to the Society (Charleston,1814), p.3

[6] J.D.Godman, op.cit., pp. 22-23,96-97.

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Rollo, youngsters were fed 'the facts about commonplace things.'[7] And tribute was paid to Bacon because he was the champion of the commonplace and, unlike Plato, aimed in his philosophy "to supply our vulgar wants."[8] With his aid, the disciples of Bacon proclaimed, this enlightened age has learned to value ordinary facts, and accordingly to shun fanciful vagaries, mere abstraction, and the metaphysical web-spinning of monkish times. Hence it was possible to say with Benjamin Tappan:

> This is emphatically a matter-of-fact age. Men delight not now, as formerly, in abstract theories and wayward imaginings. The subtleties of dialects are giving way to the truths of science; and education is ceasing to content itself with learning the languages, or storing up the opinions of past ages, and is endeavoring to reach the unknown truths it seeks to find through those which are known and acknowledged.[9]

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[7] We have already noted Goodrich as the author of the Peter Parley series. The Rollo books were produced by Jacob Abbott, and they covered equally varied fields of information. There were, of course, also the juvenile conversation books to purvey information about commonplace things. On these the lesson for the children would usually begin with some such question (either from the parent or the child) as: "Can any of you...tell me why the handles of the tea-pot...mamma is using, is made of wood?" F.C.Bakewell, op.cit.,p. 251.

"The fictitious Peter Parley, and the matter of fact Mrs.Child," declared George Kent before the Dartmouth chapter of Phi Beta Kappa in 1832,

> prolific as they have proved themselves in their respective departments, have done, and will continue to do, more towards forming the youthful mind and fixing youthful habits, than whole volumes of learned treatises and labored disquisitions.

Characteristics and Claims of the Age, p.20

"The [Adams] children," wrote Henry Adams, "reached manhood without knowing religion, and with the certainty that dogma, metaphysics, and abstract philosophy were not worth knowing." Education of Henry Adams, p. 35

[8] A.Potter, Principles of Science, p. 396.

[9] Op.cit, p. 29.

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This was the spirit that moved the Baconian of 'hard' temperament' to disparage imaginative writing and to condemn, as without grounds, the attention paid to the ancient classics in education. He came with his standard of utility and the conviction that 'facts' alone were useful. He was willing, perhaps to give imaginative literature some small recreative function in the life of man--but commerce and steam engines and banks were of sterner stuff, and they alone of moment in directing the life of man. When typical, he contradicted the past and denied to the poet and the speculative philosopher the power to guide. He invaded education and altered cultural values so drastically that in 1838 a man with the mind of Henry Adams was born to be an anachronism. Of course, the evidence shows that there persisted in the years under consideration the old-school ideal of the cultured gentleman who could quote his scraps of Horace and point to the beauties of Cicero-- and who at times could actually reveal a grasp of meaning of classic decorum. But the evidence likewise indicates that this influence was waning--that the future belonged to the 'hard temperament.'

The conflict was already joined; the 'hard' Baconian was already articulate and achieving his success early in the century. In 1822 Dr. Joseph Johnson, vice-president of the South Carolina Literary and Philosophical Society, was arguing that America, with its vast field for practical

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endeavor, need not regret that

> the best years of a man's life are not now consumed in composing and scanning Greek and Latin verses, in syllogistick exercises, in discussing the ever disputable points of Roman costume, or in studying the ponderous tomes of Thomas Aquinas and of Canon Law.[10]

And as early as 1825 a lecturer at the Utica Lyceum seemed to sense that metaphysics had already"lost the favour of practical men," and was "almost abandoned, with alchymy and catholicons, to the dreams of enthusiasm."[11] (In fact, since the closing years of the preceding century philosophy, had been trying to commit suicide in the school of common sense.) The practical and strenuous life was the Baconian ideal. The New England Magazine's very first message[12] was in behalf of an active, serviceable life devoted to the mechanic arts, and against what it deemed "the extravagant value that is set on the most frivolous exercises of the mere intellect and imagination." The constitution of man, he insists, is made for the strenuous life: health,pleasure and morality derive from the work of subduing matter. On the other hand, "they, who live by their wits...have been proverbially addicted to living scandalously;" and "secluded thinkers are apt to become dreamers," while "unceasing readers grow too full for true mental vigor."[13]

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[10] An Address to the Literary and Philosophical Society of South Carolina; Read before Them at their Anniversary, May the 8th, 1822 (Charleston, 1822), pp. 405.

[11] A.B.Johnson, An Address to the Utica Lyceum, Delivered, February 17, 1825 (Utica, 1825),pp. 9-10.

[12] "On the Consideration Due to the Mechanical Arts," New Eng.Mag.,I (1831), 1-10.

[13] Ibid.,pp. 8-10.

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> We were not made to be always meditating, dealing solitarily with out understandings and conversing with their wandering thoughts. Few could be trusted with the leisure that would permit such a thing. There may now and then be men, who are able to apply themselves almost exclusively to objects of abstract study, but even they are never the more happy for it, and they would accomplish more by a different course.

"The mind," he holds,

> grows wayward and whimsical by acting continually on itself. It is liable to be heated into extravagancies, or depressed into a morbid condition, or disqualified for the ordinary practical judgements of the world.[14]

"It must be evident," Francis Wayland maintained,

> that mind, directed in the train of the understanding, will be a far better instrument of discovery than if under the guidance of the imagination.[15]

Primarily, however, the 'hard temperament' manifested itself in derogation of the study of the ancient languages and belles lettres. Even Stephen Elliott, supporter of the old-school tradition despite his preoccupation with physical science, could find nothing more than a superficial function for the ancient languages and belles lettres. He would not have the South Carolina Literary and Philosophical Society neglect them in its endeavor to advance knowledge; but they are only the 'elegant' and 'adorning' studies; theirs is not the humanist significance. "Some branches of knowledge," explained Elliott,

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[14] Ibid., P.9

[15] Boston Convention Address, 1830, p.7

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> from the sublimity of their views, from the certainty of their results, or from their extensive application to all the occupations of life, may have the higher claims to our notice; but those which only serve to polish or decorate, merit also attention. We should no more wish to deface the Corinthian capital of science [= learning], than to sap its deep foundations.[16]

But he has described no more than 'polite learning' -- that form of cultural polish which was little more than the vestigial remains of a liberal discipline preserved in sentimental alcohol.

In 1818 the Analectic Magazine greeted the appearance of the Journal of the Academy of Natural Sciences of Philadelphia with the announcement that such a work indicates a truly civilized condition of society, whereas a flourishing state of'pure literature'is but

> the effect of a juvenile state of society, wherein works of fiction, and the deliriums of fancy, are cherished, until talents chastened by experience, exert themselves in the sober, narrow paths of solid investigation...[and] pursue with slow but patient perseverance the paths that lead to real knowledge.[17]

In the same year Andrews Norton used the pages of the North American to declare that the United States ought not to pattern its educational ideals after Europe's, since "mere scholars, mere literary artisans are but an inferiour class in the republick of letters; and certainly not that, which we have most occasion for."

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[16] Op.cit., pp. 14-17.

[17] "Academy of Natural Sciences," XI, 193.

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> It is quite as well, to say the least, that our manufactories of lexicons and editions of the classicks should be at Halle and Göttingen, as that our manufactories of hardware and woolen goods should be at Birmingham and Manchester. There is even less inconvenience in the former state of things than in the latter.

Not that literature is no longer to be cultivated. But "the literature which we want," he concludes, coupling the sentimental and utilitarian, "is effective, practical, useful literature, the literature of the intellect and the heart."[18] (Norton was destined to edit Mrs.Hemans.) More of a 'hard' Baconian was the editor of the New York Journal of Commerce who "particularly admonished" the young members of that city's Mercantile Library Association

> to avoid those books that embraced subjects of a light and trifling nature, or which tend to the contamination of morals, and to seize upon those which imbue the mind with solid and useful instruction.

Among the latter he would include

> voyages, travels, geography, history, and such portions of maritime law as are peculiarly applicable to the mercantile class...and useful citizen in every period of his life.[19]

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[18] IV, 240-241.

[19] "Mercantile Library Association," New York Mirror, V (1828), 231.

This, however, was the advice given the members of the Mercantile Library Association by John Courlie in 1839:

> "The responsibilities which will devolve upon you, as merchants and citizens, call upon you to cultivate those pursuits which will tend to elevate your minds and increase your knowledge. You all have more or less leisure to devote to reading and study, and here the opportunities of improvement are bountifully furnished.

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John M. Scott, Vice-provost of the Philadelphia Law Academy, would have future lawyers recognize the value of ancient literature as a source of beauty, eloquence and technical terminology, and of poetry generally as 'enriching fancy and improving taste.' "But beware, gentlemen," he hastened to add,

[Footnote 19, contd.

> It is not necessary, indeed that a merchant should be a literary man; but I venture to assert, that no merchant can ever attain the highest honours of his profession, unless he is essentially a reading man. Nor need he confine himself to the study of mere statistical information; he may refine and elevate his tastes, bya discriminate application of his time to the classical authors of his language, and I do not see why he may not make a profitable or a shrewd bargain, although he may devote an hour daily to the study of the English poets. The pursuit of wealth is not, or should not be, the sole object of a merchant. Where that is the engrossing principle of action, the mind becomes depraved, and the powers within us are paralyzed, and we sink into a position below contempt."
>
> "You will remember," he adds, "that the character of the merchant depends upon the character of the man, and that it can only be well sustained by the exercise of both moral and intellectual energy."
>
> An Address, Delivered before the Mercantile Library Association...January 8, 1839 (New York, 1839) pp. 18-19

Yet note that the principal emphasis of the reading could still be on the utilitarian, and besides (as a recent writer on merchants' and mechanics' libraries points out) that it was usually a superficial notion of the value of literary culture as embellishment which obtained when this consideration was at all included in the purpose of such libraries. Cf. S.Ditzion, "Mechanics' and Mercantile Libraries," Library Quarterly, X (1940), 214.

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> that the muse does not seduce you from your severer studies. Pass with her, only your moments of recreation. In her close embrace there may be lurking danger: and beautiful and lovely as she is, you may rise from too much dalliance with shorn locks and enfeebled strength. Your business is with men, and lies among the realities of life.[20]

Even Jefferson, although allowing poetry the merit of "forming style and taste" and of providing pleasure, warned that giving oneself up too freely to its charms might develop an excessive desire to indulge fancy - in fact, that it might lead to "a bloated imagination, sickly judgment, and disgust towards all the real business of life."[21]

"Utility is, in fine, fast becoming the great touchstone, the beacon light, the necromancer of the age" -- so Levi Woodbury read the signs of the times. He saw the spirit of Bacon abroad -- saw it in the ready adaptation of science to human needs, which not only resulted in material advance but in spiritual and intellectual elevation as well. The sign of enlightenment is increased concern for the cui bono.

> People at large evidently begin to think less of the languages, whether living or dead, and much more of mechanics, chemistry, mathematics, and philosophy. They say that 'Greek metres will not teach us to invent machinery, or sail vessels.' They discriminate better between the utile and the dulce,--between the essentials and the mere embellishments of life. Yet, in my opinion, it is quite too 'radical' to pretend that poetry, and even Hebrew, have not their uses and excellence, in their proper places; but, standing alone in the present era, it is manifest they possess very diminished weight in the cabinet or the camp, and

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[20] An Address Delivered to the Law Academy of Philadelphia, at the Opening of the Session, in September, 1830 (Philadelphia, 1839), pp. 3-12.

[21] Writings, XII, 91.

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> shed very little light on the great questions of government and political economy which agitate the times. The affairs of the world at large have become more dependent on a calculation of mere public interest, and are settled oftener by an algebraic process of plus and minus as to their general utility.[22]

"What, though my country may never produce a Homer, or a Virgil, A Phidias, or an Apelles?" asserted Grimké.

> What, though Michael Angelo and Raphael, Tasso and Shakespeare may never have a rival in our land; yet have we already brought forth men, greater and better, wiser, and more valuable, than the Poet, the Painter, the Statuary, and the Architect. Even at this day, have we done more for the solid, permanent, rational happiness of man, than all the artists that ever lived.

For Griscom, literature and the fine arts apparently had no bearing on wisdom and morality. He insisted that

> one citizen, the fruit and example of institutions, virtuous, benevolent and peaceful, wise and free, is worth more to his family, his social circle, his country, than the clouds of Aristophanes, the Group of the Rhodian Sculptors, or the transfiguration of Raphael.

And he promised:

> The time is fast coming when the wide-spread influence of moral wisdom, and of instructed common sense, shall assign to Poetry and the Fine Arts, a rank far below that, which they have held, from a singular concurrence of circumstances, in the judgment of the world. When this comsummation shall have been fulfilled, the Poet and the Artist, however eminent, shall then be classed far, very far below the Statesman and Orator, the [Natural] Philosopher and Historian.[23]

For moral influence, the Reverent Pierpont, as we have seen, would go to the physical sciences rather than to

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[22] Works, III,15-17.

[23] "Character and Objects of Science," in Reflections,p.48.

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imaginative literature. And, he asks, "is there not a very good reason for the fact?"

> What is literature but the record of human passions, frailties, and fancies? The merely literary man must be principally conversant with the memorials of what man has said, or done, or felt; and in his literary associations, he is brought into immediate contact with men of excitable and often excited passions--men jealous of their own reputation in the literary world, and resolved to guard it--men whose atmosphere is almost necessarily one of heat and electric excitement, and who, if they cannot succeed in attracting to themselves the notice of the world by describing the violent workings of other men's passions, will fain affect, though it be to disgust the world by the shameless extravagance of their own.

"Constituted, then, a s our nature is," he must conclude,

> and as is all nature, it is not possible that the moral influence of physical science should not be more propitious than literary pursuits to the culture and improvement of the moral sentiments: nor, when it is considered that our literary studies often result in the knowledge of man, at best--the knowledge of his opinions, his actions, the creations of his fancy, the extent of his power, his frailties, or his sufferings; while physical investigations introduce us into the store-houses of truth, store-houses that are filled with the knowledge of God, of what he has done and is doing--the knowledge of his power, his bounty and his universal beneficence,--can it be doubted, that the treasures that reward the labor of the literary man...are less valuable to the mind that is to subsist forever, and can subsist only upon 'every word that proceedeth from the mouth of God,' than is the solid wealth, the durable riches, that belongs to the man of physical science.[24]

Thus the Hebraic spirit, so much a part of the Baconian, could strengthen suspicion of belles lettres. We have already noted the virtue of labor extolled in connection with

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[24] "On the Moral Influences of Physical Sciences," Amer.Inst.Lectures, 1832, pp. 96-99.

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the Promethean theme. More than once will the moralist bias be seen to exert an influence upon the Baconian attitude towards imaginative literature. Thus Dr. Griscom, for whom "the grace of God" in conjunction with "sound learning and science" were prerequisites of "moral purity,"[25] rejected an invitation to hear a lecture on Shakespeare, since the dramatist's writings were deficient in morality.

> That there are many noble thoughts, many humane sentiments, many profound and correct exhibitions of human nature, which may be culled, as the bee gathers sweets from poisonous plants, from these writings, he would not deny. But, that, taken in their totality, they demoralize society to a great extent, is an opinion, whether right or wrong, he has long entertained. As mere literature they would do less harm; but even thus limited, he believes, if generally read, they would never aid a single soul onward towards the kingdom of Heaven. On the contrary, by their numerous exhibitions of vulgarity and vice unrebuked, they pander to the lower appetites, and thus obstruct the paths of innocence and virtue...Did persons of respectability shun the theatre, it would stand forth in its naked deformity, and publicly be far less injurious to the interests of Christian morality.[26]

The same temper was displayed in our Dr. Griscom's reactions to the Louvre statuary (an example of what the 'Greek spirit' would have to fight against in a deep-dyed Baconian). On entering the Louvre, he writes,

> the first effect is astonishment, at the freedom of the exhibition. There is nothing in statuary or painting which shocks the female delicacy of the French... The public gardens

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[25] Quoted in John H.Griscom, Memoir of John Griscom (New York, 1859), pp.363-365.

[26] Ibid., pp.45-46. This is not given as a representative view, of course, but as an indication of a general tendency.

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> abound with statues, which, in America, are only placed behind skreens [sic] in our exhibition rooms. The most highly wrought models of the Venus de Medicis, serve as decorations in some of the coffee rooms, and other places frequented by both sexes, and yet the dress and manners of the French women, are, at least to appearance, quite as decorous as those of England and America.

And Griscom is forced to conclude that such mores betoken social debasement:

> From the simple view of the case, it might be at first concluded, that the style of manners in France, in relation to those denuded exhibitions, cannot be unfriendly to public morals;--nor have there been wanting philosophers, of both sexes, who have contended, that our common notions of decency are entirely artificial; and that the concealment of truth and nature, is more injurious to purity of sentiment and feeling, than the simple and undisguised habits of the Pelew or Fejee islands. But it might easily be proved, as I conceive, by a reference to the history of those islanders themselves, that in proportion to the advancement of human society in civilization and intellectual refinement, such primitive habits are found to be entirely compatible with the preservation of public and private virtue. Nor is the actual state of morals in France, any evidence to the contrary; but, as I believe, greatly the reverse. Their own records publish to the world, that one third of the births in the city of Paris...are 'hors de mariage;' and as to conjugal fidelity, where could the person be found who would have the courage to rank this among the prominent national virtues?[27]

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[27] Year in Europe, I,250-252. Another illustration of this temper is this choice bit from the Southern Literary Messenger, I (1835) 376:

> "Few works of any excellence ever reach us, and these are for the most part confined to large cities, where those who visit them are more attracted by the subject than the execution of the painting. A striking illustration of this, may be found in the

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The sight of the Elgin marbles evoked from Griscom only remarks on their cost to the British government and their "admirable workmanship"![28]

Similarly the Reverend Albert Barnes of Philadelphia, who credited the ancient Hellenes with only two achievements (and they of dubious worth), Greek fire and the art of sculpture, declares of the latter:

> ...we may observe, that its utility to the advancement of society must have been extremely limited. That it would contribute to the promotion of public knowledge of morals, can hardly be pretended...[W]e may observe that Whitney has contributed more by the cotton-gin to the advancement of the wealth and prosperity of this country, than was done for Greece by all her genius in sculpture; and that he who contributes to the improvement of a printing-press, or steam-engine, really does more for the welfare of society, than all that genius, exercised on blocks of marble, can ever effect.[29]

Of course this expresses that 'Puritan' hostility to aesthetic and deeply imaginative experience which has left so enduring a mark on American society.[30] At the same time, it must be remembered, the pious Baconian's susceptibility to the sentimental and demand for the moral made it possible for Scott

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[Footnote 27, contd.)

> crowds which rushed a short time since, to see the immodest and demoralized exhibition of our first parents in a state of nudity - an offence for which Ham was accursed to be a servant of servants to his brethren; and yet our modest maidens, attended by their equally modest beaux, hastened in company to view this production of Parisian profligacy. At the same time, the splendid painting of 'Christ rejected' by the eminent West, scarcely attracted notice; and the beautiful 'Star of Bethlehem' by Cole twinkled in an empty hall."

[28] Ibid., pp. 91-94.

[29] "The Advancement of Society," American Quarterly Observer, II (1834), 232-233.

[30] Cf. Grant Wood's famous painting, "American Gothic."

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and Maria Edgeworth[31] and Mrs. Hemans to receive acclaim for their fiction and poetry in early nineteenth-century America.

The combination of attitudes described is well represented in the Reverend George W. Burnap of Baltimore. Burnap stood for the strenuous life, the life of useful achievement. And he stood for holiness, as an aid to which he recommended Paley's Moral Philosophy, a book that "ought to be read by every young man about to take upon him the duties and responsibilities of life." The Reverend Burnap was not at all convinced of the value of higher education devoted to abstractions and the learned languages. After all, it was the strenuous life and knowledge gained through practical experience that made effective men.[32] "Look into our own National Legislature," he directed.

> Who are they who place themselves at its head, and gain the greatest influence over its deliberations? It is not the mere scholar, nursed up in the effeminacy of literary leisure. It is not he whose knowledge gained by mere reading is most extensive. It is more often the man, who has been trained up in the school of business, whose mind has been disciplined by action, as well as stored with [useful] knowledge...

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[31] Cf. James Ogilvie, who after a violent outburst against the 'endless multitude of novels' (among which there are few that "innocence can read with impunity, modesty, without a blush, taste without disgust, philosophy without scorn, and piety without offence"), makes an exception of Maria Edgeworth as one novelist who has shown how fiction can embody all the virtues of which the contrasting vices are found generally in novels.

"On the Modern Abuse of Moral Fiction, in the Shape of Novels," in Philosophical Essays, pp. 148-265.

C.J.Ingersoll in 1823 observed that "nearly 200,000 copies of the Waverly novels, comprising 500,000 volumes, have issued from the American press in the last nine years." Influence of America on the Mind, p. 18.

[32] Lectures to Young Men, pp. 17-21, 42-45.

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Academic pursuits are not adequate preparation for successful living:

> It is much easier to superinduce the ornament and aid of a cultivated mind, upon business habits, than practical efficiency upon a merely scholastic education. The mind must be consolidated by close and vehement application of its powers to things which task its strength to the utmost. Action forms the intellectual constitution to robustness, energy and strength. Mere scholastic education has no such power. It may give grace anddexterity to action, but cannot confer original and self-sustaining force.[33]

The opinions of a Pestalozzian and those of the practical man of 'hard temperament' inevitably suggest each other. As for the studies which can be of value to the Baconian in his strenuous career, Burnap recommends, after due attention to moral philosophy, civil and pditical law and political economy. For texts he suggests Paley's Moral and Political Philosophy and, significantly, the Wealth of Nations.[34] Nor would he have his young Baconians forget the importance of the daily newspaper (and here appears the Baconian tendency to derogate ancient learning). "Perhaps," he remarks,

> I ought to beg pardon of the shade of Herodotus when I avow, that I consider the yearly contents of one good newspaper as more valuable than all he ever wrote....It certainly concerns me more nearly to know how the struggle terminated at Washington a few weeks since in the election of a speaker, than to get the clearest idea of the assassination of Julius Caesar in the Roman Senate house nineteen centuries ago.... I reverse the antiquarian's maxim that every thing is interesting and important in proportion to its antiquity.[35]

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[33] Ibid., pp. 21-22.

[34] Ibid., pp. 47-51.

[35] Ibid.,pp. 51-52.

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As might have been anticipated, this 'hard' Baconian is suspicious of what he terms "pure literature," though granting it the value of amusement. And since it is useful for "recreation and delight" rather than "for the nourishment and strength of the mind," as a man of 'hard temperament' he would have indulgence in it carefully restricted.

> Like all dainties they are to be used with discretion. He who neglects solid food and attempts to live on sweetmeats alone, will soon be overtaken with nausea, sickness and disgust; so he, who passes his days in reading poetry and fiction, will lose all strength of mind and energy of character.

But, of course, the Baconian does need something with which to relax after a period of strenuous, important living--and here there is a service for moral writers to perform.

> There are hours in the life of all when the body is exhausted and the mind depressed, when all its powers of severe thought are expended, and its elasticity broken down. Then it is, that the pages of Scott or Edgeworth seem almost a providential gift, and they refresh the soul with a power as gentle but as potent as the sight of green fields and blooming flowers to the languishing invalid.

True, there is "moral instruction" along "with the most exquisite pleasure" to be derived from Scott; that is his special claim to greatness. Poetry, too, "is not only the instrument of pleasure, but the means of moral improvement." Yet for Burnap such sources of moral instruction communicate through the 'affections.' He is the representative Baconian--readily sentimental when the demands of the strenuous life are relaxed. Being a pious Baconian too, his sentimentality is pervaded with morality. Consequently, he would find quite congenial the blending of a religion of the heart with delicate

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observance of exquisite distinctions in such writers as Scott, Edgeworth, and Mrs. Hemans. In any case, the 'hard temperament' dominates in Burnap, for he advises the young not to spend their money first on

> novels and other ephemeral frivolities, but [on] books of reference, such as the cyclopedia Americana, or if possible Rees, or the Edinburgh--maps and works on descriptive geography. Then elementary treatises on all the different branches of science and literature are in order. Then come pure literature and criticism.[36]

There is no hint here of any deeper significance to "pure literature"--no suggestion that living may require more than factual information. In short, we find nothing but a superifical relationship,if any, between literature and life. Man was to seek discipline and values in 'practical' activity and 'practical' reading--certainly not in poetry,

> so exquisite and celestial a gratification that it is not often that the mind which is merged in the cares and toils of this world, can find time or tranquillity to give itself up to its delights.[37]

To Professor Silliman, similarly including articles of belletristic interest in the Journal of Science was to "permit a little of the graceful drapery of general literature to flow around the cold statues of science,"--or to provide an "Oasis" to refresh.[38]

The dichotomy of life and literature thus expressed by the Reverend Burnap and others is reflected in the prevalent

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[37] Ibid., p. 56.

[38] XVI (1829), Preface, iv-vi.

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romantic notion of creative writers as enthusiasts dwelling apart in a fairy realm of the imagination--a belief not rendered less tenable by the appearance of a "Fall of the House of Usher" or Culprit Fay."[39] In this view belles lettres seemed to have no necessary bearing upon the life needs of the workaday individual. And the workaday individual, for his part, began to absorb the idea that there must be something abnormal, effeminate-- or in our day, 'Bohemian'-- about anyone who takes imaginative writing too seriously.[40]

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[39] The Knickerbocker school, of course wrote (and often quite well) in this tradition - the gay, the sentimental, the entertaining, the exciting and the bon-motist tradition. Irving, Paulding, Sands and others associated with the group shared the concept of literature as 'polite letters,' were nostalgic for old memories, fond of 'the life of fancy and imagination.'

[40] The man of 'hard temperament' could have already pointed the finger of scorn at, for instance, John Brainard, who by his own admission was a sensitive plant unable to live in the rigorous climate of a law office. Writes this memorialist (Brainard died in 1828):

> He beckoned to the muses, when he should have secured a client. He cherished an over-wrought sensibility, when he should have ventured the asperity of the world's men and the world's ways. In short he considered himself as possessing a 'temperament', to use his own words, 'much too sensitive for his own comfort.'

So Brainard turned to poetry, or, as his memorialist put it, "abandoned" law "for the no less trying, and far more precarious career, of the literary adventurer. Such cases as this (several have come to my attention(must have been in the mind of the vice-provost of the Philadelphia Law Academy, when he warned students against 'the seductions of the muse.' Vid. p.

James G. Percival illustrates remarkably the inability of the Baconian to achieve an integration of learning, literature and life. Considered one of the age's most learned men, trained as a scientist and author of respected scientific works, he was nevertheless an impractical dreamer, who desired

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A respectable person, if he turned to literature at all, did so merely for amusement, for relaxation. The dichtomy of life and literature paralleled the division of creative writer and practical man. "Poets," wrote a contributor to the Literary Gazette, contrasting that species with "common-sense men,"

> *create a fairy land in their own imagination;* and, looking abroad upon their own creation, they can enjoy a bright day even amid the storms of the world.

Their distinguishing temperament is that "same enthusiasm in thought and sensibility in feeling" which prompts men to love. But too often their "high and exquisite tone of feeling" runs to excess, with resultant "want of harmony between these feelings themselves, and between them and the feelings of other men."[41] The "common-sense man," on the contrary, is marked by a "beautiful proportion and balance" of mental "powers" that fit "him for the business of life, and for its enjoyment."

> The common-sense man is a deliberate, thinking man; grown cautious from his treasured wisdom in human affairs, --always consistent with himself, and true to his own character.... He has directed his mind to those practical pursuits, which have so wide a bearing upon the state of society, and with a cautious prudence has treasured up facts for his future benefit. He has done good to society both from speculation and from action. His theories rest upon facts, and their truth is known by their practical application.

[Footnote 40, contd.]
ardently to become a great poet but believed that poetry is a kind of divine madness - a product of free, natural passion. Cf. Poetical Works,I,81,381-402; J.H.Ward, Life and Letters of Percival, p. 560; Henry E. Legler, James Gates Percival, an Anecdotal Sketch and a Bibliography (Milwaukee: The Mequon Club,1901),pp.54-56.

[41] "The Lay Monastery," U.S.Lit.Gaz.,II (1825),183.

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He it is, in fact,

> who is really experienced in human ways, and who knows how to apply his knowledge to the increase of human happiness.[42]

Distrust of the imagination is likewise strong in Dr. John Godman. "Fears are occasionally expressed," he remarks

> that the increasing disposition to study facts, or the realities presented in nature, will lead to the destruction of what is called the poetry of life. Some persons fear that the world may become too wise for its own happiness, and at length have nothing left for its amusement.

To Dr. Griscom, however, "such fears...are as groundless as they are unwise"; for in his opinion

> there is slight danger of the world ever becoming so wise as to have nothing left to learn, nor is there much probability that the happiness of human life would be at all diminished if the dominion of imagination were entirely subverted. This dangerous faculty of the mind may be disciplined without being destroyed, and brought to operate as successfully and advantageously upon the materials afforded by nature, as upon any of the absurd monstrosities which have at various periods been created and canonized by imagination, to the lasting detriment of mankind.

The spirit of Poor Richard, evidently, is what society primarily needs. "If Franklin," he argues,

> instead of patiently and carefully examining every fact, and repeating numerous experiments, had contented himself with a wild excursion into the vague realm of conjecture, and in a felicitous description of some delicious day dream-- had given us a theory of the identity of the electric spark, and the lightning of heaven, or had indulged himself in fancying how the
>
> '--sulphurous and thought-executing fires,
> 'Vaunt couriers to oak-cleaving thunderbolts.'
>
> might be deprived of all their terrors, his boldness of thought might have excited astonishment,

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[42] Ibid., pp. 185-186.

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> and his poetic ardour have awakened admiration. Happily for humanity his mind was of a different order, he examined facts and appearances...[45]

The Atlantic Magazine would not have such 'practical men' looked down upon for any lack of literary accomplishments. The merchant, for example,

> may not, it is true, be profoundly acquainted with 'longs and shorts' of prosody, but he understands them thoroughly when applied to the staple of the country. He may be ignorant of the value of the Greek articles; but, what is far better, he comprehends the value of every article of commerce. He may even affect to smile at the niceties of book learning, but he takes care that his own books will bear the most rigid inspection.[44]

Naturally, this sort of attitude carried with it particular hostility toward the study of Greek and Latin. In these years (as before and for some time after) the ancient classics were the center of animadversion generally wherever education was subjected to critical examination.[45] To the complete Baconian, as champion of 'our enlightened and matter-of-fact age,' they seemed to merit special detraction. For not only did they seem to him to be accorded a significance undue mere "polite literature" with no more than "fashionable or conventional" suffrage,[46] but they were

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[43] "On the Study of Natural History," Addresses, pp.130-132.

[44] "Annals of the Lyceum of Natural History," Atlantic Magazine, II (1825), 314.

[45] Cf. Bache, Report on Education, p. 365:

> The question of the uses and abuses of classical and scientific instruction has been held up in almost all possible lights, in the keen strife which has arisen for the possession of the secondary schools.

[46] C. Caldwell, Thoughts on Education, pp. 130,157.

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also the product of a past ungraced by the influence either of Christ or Bacon; and moreover, in violation of all Baconian pedagogical canons, they persisted in maintaining a dominant position in education. We have already noted how the Greek and Roman achievement was belittled in contrast with the vision of the brave new world; how, as a result, the Baconian mind was disposed to judge Rome, for all "her gifted and eloquent men," as lacking in true intelligence and morality, and Athens as wasting its "acuteness... chiefly in wit and trifling."[47] As a believer in progress the Baconian denied that there was anything to learn from the ancients; as a 'Puritan' he condemned their morals and religion;[48] as a man of 'hard temperament' he belittled their

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[47] Christian Examiner, VI (1829), 80.

[48] Thomas Smith Grimké was undoubtedly the most vigorous and uncompromising of those Americans who assailed the position of the classics in education, on the grounds that they were a pagan and and licentious literature. Grimké zealously advocated the substitution of the Bible for classical literature in the schools. He repeatedly inveighed against a system of education wherein "Christians not only expose the young, designedly and joyfully, to the unhallowed influence of Paganism"; but where "these are constituted almost the vicegerents of education, in history and eloquence, in rhetoric, poetry and morals." "Address on the rhetoric, and Duty to Adopting the Bible as the Text Book...in Every Scheme of Education," in Reflections, p. 76. Grimké'would rather have written Cowper's Task than the Epistles of Virgil and the Satirs[sic] of Juvenal and Persius'. He found "more power, fidelity, and beauty in Walter Scott, than in a dozen Homers and Virgils." - and certainly more sublimity and morality. Oration on American Education, Delivered before the Western Literary Institute and College of Professional Teachers...October, 1834 (Cincinnati, 1835), pp. 16-17,39. Cf. also his "Oration on the Advantages, to be Derived, in a Literary Point Merely, from the Introduction to the Bible, as a Text Book of Sacred Literature, in Every Scheme of

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writings as largely 'pure literature'; and as a pedagogical naturalist he censured the study of their languages as of 'words' not 'things,' mere memory-exercise outraging nature.

Of course, when it is pointed out that in America at this time the controversy involved the idea of progress, it is not implied that la querelle des anciens et des modernes involved different fundamental issues at any other time or place in its long history. Fortunately it is unnecessary to justify a rehearsal of the primary ideas underlying the controversy with a promise that some totally new philosophical element will be revealed. In the attack on the ancients by the nineteenth-century American Baconian runs the same theme encountered in Bacon, Pascal, Fontenelle, our own Dr. Benjamin Rush, and others:[49] antiquity was the childhood,

[Footnote 48, contd.]

Education from the Primary School to the University: Delivered before the Connecticut Alpha of the Φ B K Society,...1830," in Reflections, pp. 111-162.

Francis Wayland, president of Brown, was not at all convinced of the value of the ancient Classics, but was certain that they were inferior to the Scriptures. "Considered simply as an intellectual production," he observed, "who will compare the poems of Homer with the Holy Scriptures." Duties of an American Citizen, pp. 21-22,44.

[49] Cf. John B. Bury, The Idea of Progress; an Inquiry into its Origin and Growth, London, 1920; H.Rigault, "Histoire de la querelle des anciens et des modernes," Oeuvres complètes, Paris, 1859, vol.1.

> Au fond du débat il y avait une idée philosophique, une des plus grandes qui puissent être proposées a l'esprit humain, parce qu'elle interesse la dignité de sa nature, l'idée du progres, intellectuel de l'humanité.
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> Ibid., p.xxx.

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this present the maturity of the world. However, it will be well to indicate particularly how the Baconian mind in early nineteenth-century America adapted the materials of this argument; how that mind was reflected in animadversion against classical studies. We may then see how Baconian preconceptions were specifically integrated with opposition to classical learning.

In the first place there was the idea that the moderns surpass the ancients in learning. And the evidence was, of course, principally scientific and technological advance--the fruit of the inductive method. This argument need not be further illustrated here.[50] Then there was the matter of moral and religious progress. Christianity, especially since the Reformation, we have seen, shared with the rise of science the credit for man's improvement. Moral efficacy was also ascribed directly to the diffusion of knowledge which is power. In any case, the pious Baconian

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[50] Cf. "Academical Education in England," AJE,I (1826), 524-539; Caldwell, Thoughts on Education, pp. 130-131, 137, 148,173,183-184; Mathew Carey, Reflexions on the Proposed Plan for Establishing a College in Philadelphia, in which English Literature, the Sciences, and the Liberal Arts Shall be Taught, p.17; "Defects of Liberal Education," AJE,II (1827), 74-75; Samuel Jackson, Nature Improved, pp.13-15, 44-50; Journal of the Proceedings of a Convention of Literary and Scientific Gentlemen, Held in the City of New York, 1830, pp.23-24; "Rumford," The Claims of Classical Learning Examined and Refuted by Argument, and by the Confessions of Scholars (Boston, 1824), pp.3-4,9-12,58-79; "Webster's Speeches," N.Am.Rev., XLI (1835), 231-234. The correspondent of the Southern Literary Messenger who, in 1840, insisted that the Smithsonian Bequest be applied to scientific and technological education, proclaimed: "Our whole system of education is an insult to the dignity of mankind." It did not seem to recognize, for example, that whereas "the Aeneia is[only] the property of Italy," the "printing press" is "the property of the Universe." I,26,29.

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could readily follow Benjamin Rush in denunciation of the 'pagan and licentious' classics.[51] Professor Thomas Dew of William and Mary felt certain that it was a mistake to "substitute the undefined and loose system of morality" as well as "the high sounding and empty philosophy of the ancients, for the purer morals and deeper learning of the moderns."[52] The Journal of Education on one occasion revealed some anxiety because the "department" of mythology was "one to which it is extremely difficult to do justice, without entering into improper details."[53] The foe of the classics who styled himself "Rumford" (after the American expatriate who did so much to promote the physical sciences) was more outspoken in his charge that

> the ancient classics are in general so extremely licentious, not to say disgusting, as to be wholly unfit either for the school or the parlour, without a severe expurgation--and even then, how little consistent with modern ideas of propriety.[54]

Thus he would consider them quite unsafe guides for conduct, even were it not true that human nature has altered since antiquity.[55] "Even the opening of the Iliad," declared Dr.

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[51] Benjamin Rush, "An Enquiry into the Utility of a knowledge of the Latin and Greek Languages," American Museum, V (1789), 525-535. See Appendix IX, p. xxiii.

[52] "An Address on the Influence of the Federative Republican System of Government upon Literature and the Development of Character," So. Lit.Mess.,II (1826), 267-268 n.

[53] I (1826), 125.

[54] Op.cit.,p.55. This essay was originally published in the "Boston Centinel," we are told. Ibid.,p.4.

[55] Ibid., pp. 72-74.

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Samuel Jackson (in the tradition of Dr.Rush),

> which is still considered the noblest of human productions, is such as cannot be read by a gentleman to his modest dulcinea. The two greatest of the Grecian commanders are made to quarrel, in the face of all the people, about the possession of a black-eyed girl, whom Achilles had carried away from her parents. The Phthian leader is robbed of his prey, and therefore he withdraws his troops from the common cause. His character was no doubt wonderfully suited to the savage genius of antiquity; but it ought to prove highly revolting to the generous spirit of civilized nations. His chase of Hector round the walls of Troy is made both disgusting and ludicrous, and is such a picture as might delight our American Indians; while his denunciations during the combat are suitable only to the cannibals of the South Sea.

"It is vain to presume," he adds,

> that the steady admiration of these atrocious heroes, which we infuse so early into the minds of our children can have no tendency to corrupt the human heart.[56]

Whelpley's Compend of History brought to American schoolboys much the same opinion of the heroes of antiquity. "A character more unlovely, than that of Achilles," they were informed, "cannot well be imagined."

> Indeed, strength and courage are the favorite virtues of Homer; under whose burning pen, they often degenerate into cruelty, barbarity and revenge.[57]

Censure of the ancients for moral turpitude was, of course,

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[56] Op.cit., pp. 33-36.

[57] Samuel Whelpley, A Compend of History from the Earliest Times; Comprehending a General View of the Present State of the World... revised by Joseph Emerson (10th edition, Boston and New York, 1828), p. 237.

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generally associated with denunciation (having centuries of precedent) of their paganism, particularly as expressed in their literature. Thus we find Dr. Jackson also complaining:

> Their gods are made utterly ridiculous; sometimes they are spiritual substances, sometimes corporeal and made to mingle in all the low and filthy corruptions of corporeal nature.[58]

And he quotes Lord Kames's opinion "that Homer's deities do no honour to his poems."[59] In view of this deficiency, and the fact that the ethical principles of the ancients have been "superseded by the New Testament," he is

> not a little surprised to find, that a truly great and good man of our own country [John Quincy Adams] should propose Cicero's Offices as a 'valuable and congenial supplement' to this sacred book.[60]

The Reverend William Allen, in his inaugural address (1820) as president of Bowdoin College, even though willing to accord the ancient classics some value in forming and gratifying "our literary taste," expressed his fear that the writers of antiquity "may deprave our moral sentiments and corrupt our hearts."

> As they were ignorant of the sublime doctrines and the noble principles of action, which are presented to us only in the pure word of inspiration, it is not to be supposed, that the splendor of moral truth should beam from their pages. In their researches, however wonderful, they never discovered the original fountains of virtue. They gave us many descriptions, inflammatory and contaminating. They exhibit to us some flagrant vices without branding them with the infamy, which should ever be attached to them. They hold up unlovely characters as

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[58] Ibid., p. 19.

[59] Ibid., p. 22

[60] Ibid.,p.45.

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> models for imitation, whose false glory seems likely to dazzle the youthful reader and to subject him to most pernicious and fatal delusions.[61]

"It is a mournful reflection" decided a reviewer of Frances Wright's A Few Days in Athens, for the Atlantic Magazine,

> that for seven centuries, 'Athens, the eye of Greece,' and the intellectual light of the world, advanced not a step in the discovery of truth; but contentedly inculcated the dogmas of philosophers, who, however, they differed in every other particular, agreed in rejecting a future state of rewards and punishments, as not essential to their system of morals; who allowed, and sometimes commended suicide; who held that men might rival the gods in happiness; and referred the merit of every action to a doubtful result or a selfish motive.

"It is humiliating," he adds,

> to the pride of human reason, to remember that the wise and brave and eloquent men of Rome, whose policy subdued and half civilized the world, when debating on the origin, capabilities and destiny of that immortal principle within them, by whose energy their own fame and the power of their empire were established, were soon lost in visionary conjectures or utter darkness. With no sanction for morals, no hope beyond the grave, the great and good and learned of the Pagan world might have been instructed by a little child who had beentaught the simple truths of revelation; as the great founder of our faith and author of our hope instructed, when a beardless stripling, the hoary members of the Sanhedrin, and the doctors of the Jewish law.[62]

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[61] "An Inaugural Address, Delivered in Brunswick, May 16, 1820, on Entering upon the Duties of President of Bowdoin College," in Decade of Addresses, pp. 19-20.

[62] I (1824), 368-369.

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The "whole range of theological thought" of the Greeks and Romans can be characterized, thought Nathan Beman, "in three words--ignorance, puerility and vice."[63] If in view of America's political extent and enlightenment, decided William Sullivan, analogies cannot be drawn with the republics of ancient Hellas,

> our resemblance to the Greeks becomes still less, when we consider them as a people who made their religion out of monstrous mythological fables, and absurd mysteries; and who governed their public, and private affairs, by the equivocal answers of oracles, and by contemptible superstitions.[64]

And a contributor to the Southern Quarterly Review revives, in connection with James Hillhouse's Hadad, the Renaissance controversy over the comparative merits of pagan and Christian epic--which he decides, of course, in favor of the latter. For he believes that "the Scriptures afford" the modern dramatist

> the advantage of annals more miraculous than those of the Greeks, with this superadded excellence,--they are true. The scope afforded is wider,--for a blind destiny, and the caprice of the gods, which formed the groundwork of most of their fables, restricted the dramatic action; while the workings of conscience, and the wild play of the passions, which are the distinctive characteristics of the christian [sic] faith, afford the most ample space for the exhibition of the varied emotions of the soul. In the sublimity of truth, in variety of incident, in enthusiasm of feeling, on contrast of station and character, the biblical

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63 Middlebury Oration, 1825, p.8. Beman is willing to qualify this assertion with: "at least where no faint or reflected rays of revelation had visited them." Loc. cit.

64 Pilgrim Society Discourse, 1829, pp.15-17.

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> record is infinitely superior to the Grecian muthos. What are its thousand deities, compared with the one living and true God?[65]

The banker-poet, Charles Sprague, rejected the custom-sanctioned pagan invocation for his"Boston Centennial Ode." "Not to the Pagan's mount I turn," proclaimed Sprague,

> For inspiration now;
> Olympus and its gods I spurn--
> Pure One, be with me,Thou!
> Thou, in whose awful name,
> From suffering and from shame,
> Our Fathers fled, and braved a pathless sea;
> Thou, in whose holy fear,
> They fixed an empire here,
> And gave it to their Children and to Thee.[66]

This was the spirit, in short, which entered into the pious Baconian's hostility towards classical learning. Even when it did not lead to complete and unequivocal condemnation, it reinforced the tendency to question the value of spending much time with ancient literature. And it was readily assimilable with the values of a 'hard temperament' that saw virtue in labor, in utility. Hence, we find both the Christain moralist and the utilitarian frequently joined in the Baconian attack upon ancient learning.

The 'hard temperament,' which we have already noted tending to detraction of belles lettres generally, is everywhere in evidence among opponents of the traditional emphasis in education. "Is there not, at some of our fountains of knowledge," asked Dartmouth's Phi Beta Kappa orator in 1828, "an undue, a culpable partiality shown for the dead languages, and for the more elegant, but, shall I say it, less useful

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[65]"Hillhouse's Hadad," I (1842),125-126.

[66]An Ode: Pronounced before the Inhabitants of Boston,

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departments of learning?"[67] The question would have been answered in the affirmative by one contributor to the Academician who complained of the inutility of "a smattering of Latin and Greek." "These," he contended,

> to the exclusion of all natural or physical science, will make but a poor show; and as much as the sticklers for Latin and Greek think of these, they will neither make a man wiser norbetter, unless with them is joined an enlargement of mind, which, perhaps, is more to be expected from moral and physical science than from any thing else.

"we know full well," he adds,

> that there are many in society...who rate the talents of men from their knowledge of the languages, and consider all who are unable to scan the matres of Horace or Virgil, or translate Pindar or Homer, as dolts and blockheads, fit only to be made the sport of such marvellously wise beings as themselves. No men, perhaps, admire the writings of the ancients, or value them more than we do; but we must confess, that we can see no shade of reason why so much time id devoted to them in schools and colleges, while the physical sciences are in many almost wholly neglected...The languages may adorn sense, but sense they cannot give.[68]

Rumford is even more emphatic. "What greater infatuation, he argues,

> can be imagined than that of retaining the languages as an indispensable branch of education, at a time when every thing they excusive-contain is admitted to have lost its value.

[Footnote 66, Contd.]

September the Seventeenth, 1830, at the Centennial Celebration of the Settlement of the City (Boston,1830),p.3.

[67] F.Hall,Oration on Importance of Cultivating the Sciences,p.7.

[68] I (1818),205-208.

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> Yet at this very day the dialects of Greece and Rome are taught with scarcely less enthusiasm than at the period when they were believed to be the only possible source of information. Classical partialities, for many years expelled our halls of science, still loiter in our schools. Homer and Virgil, Plato and Cicero are still the charm--still the precious rosary, by which every youthful aspirant is taught to count his lessons, and appreciate his mental stock. And worst of all, ancient Prosody, that farce of farces, still wins the prize. Now here, if I mistake not, is a force of delusion unmatched by anything even of the 16th century--an incongruity which no past age could equal, and no future perhaps ever believe.[69]

For when they are "brought to the test of reason,"[70] we can but conclude that Greek and Latin "have long outlived their usefulness."[71] As for those who endeavor to make it a merit of classical learning that it is not to be measured in terms of 'mere utility,' "Rumford" would respond that utility is the only truly philosophical standard of value. He demands that things be valued as "they subserve the actual interests of humanity"--that the "cui bono...never be out of sight."[72] The favor shown the classics, he argues, is not the result of any estimate of its usefulness, but of the power of "fashion" over the minds of men.

> But why, it may be asked, does scholarship raise her crest so high?--Why do men plume themselves on acquisitions so indeterminate, and so

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[69] Op.cit.,p.4. In his attack, Rumford quotes from Dr. Rush as well as from Bacon, Locke, Priestley and Lord Kames (Ibid.,pp.17-18).

[70] Ibid.,p.5.

[71] Ibid.,p.128.

[72] Ibid.,pp.63-64.

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> unsubstantial? The reason, as I believe, simply is, because academic influence has set its seal on that sort of acquisition, and fashion has attached her countersign. It is worth remembering, however, that there was time when alchemy enjoyed the same consideration, and was sustained by the same means as Greek and Latin are now; and another time when the only avenue to fame led through the dreary maze of syllogistic logic.[73]

And Dr. Jackson was of the same opinion, preferring to see the fostering of "recondite frivolities" give way to the cultivation of studies that can be "brought home to men's business and bosoms."[74] For to Dr. Jackson an epic of Homer is nothing but wild imagining--an "absolute outrage upon truth and nature, which cannot affect our modern nerves."[75] There is no room for the play of fancy in this physician's plan of discipline! To the editor of the New York Mirror, writing in 1827, those who cultivate the study of the classics are merely engaged in "a refined, but rather laborious kind of amusement." Hence he would advise, in the interests of utility, the study of modern languages instead of the ancient.[76] The faculty of Amherst in their "Two Reports" of 1826 likewise favored the introduction of modern languages as at least of utility,[77] and we find this idea reiterated in still other quarters. The faculty of Amherst seemed conscious of a growing criticism of the traditional education as lacking in attention to those things that belong to "men's business and bosoms." Public opinion in this "age of improvement," they

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[73] Ibid.,123-124.

[74] Op.cit,pp.55-57.

[75] Ibid.,pp.20-21.

[76] "Education," V.79.

[77] Op.cit.,p.6.

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informed the college trustees, is demanding an education that can "meet the wants and demands of an enlightened" society.

> Why, it is demanded, such reluctance to admit modern improvements and modern literature? Why so little attention to the natural, civil, and political history of our own country and to the genius of our government? Why so little regard to the French and Spanish languages, especially considering the commercial relations which are now so rapidly forming and which bid fair to be indefinitely extended between the United States and all the great southern Republics? Why should my son, who is to be a merchant at home, or an agent in some foreign port; or why, if he is to inherit my fortune, and wishes to qualify himself for the duties and standing of a private gentleman, or a scientific farmer--why, in either case, should he be compelled to spend nearly four years out of six, in the study of the dead Languages, for which he has no taste, from which he expects to derive no material advantage, and for which he will in fact have but very little use after his senior examination?

The faculty recommended that the college respond to this request--that all colleges, in fact, "promptly lead on in the mightymarch of improvement"--or suffer decay. "Such questions as these," they admonished,

> are every day asked, by men, whose strong good sense, education and standing in society, entitle them to be heard; and it does not satisfy them to be told, even from the halls of science, that a knowledge of the Ancient Classics is in all cases of pre-eminent importance; that no man can speak, or write English correctly, who has not read them; that the present system has the advantage of great age, and the sanction of long experience; that innovations are dangerous; and that, if the young men of this generation profit as much by a liberal education as their fathers did, the public will have no reason to complain.[78]

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[78] Ibid.,pp.3-8.

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In the spirit of such critics of education the Reverend Rufus Anderson, urging the "importance of teaching science to the heathen in connection with Christianity," would have it understood that "the excellence of ancient classic writers consists rather in felicity of expression and beauty of style, than in real utility of thought."[79] And the utilitarian argument is ludicrously incarnate in John P. Kennedy's Mr. Chub, the schoolmaster who "has never read any politics of later date than the time of the Emperor Constantine,--not even a newspaper."[80] In the interests of social utility M. Charles Paterson warned that

> if the affluent and the learned will bury themselves in their luxury and ease, or confine their labors to the more attractive but not more valuable study of ancient literature, and neglect the intellectual condition of the great body of human beings who must always be dependent [sic] upon manual labor for their support, what right have they to complain if they shall hereafter see the popular suffrage, ignorant but honest, directed by the lying devices of designing demagogues, sapping and undermining the glorious fabric of our consitutional liberty, and removing one by one, the props and buttresses which our fathers built about it![81]

The Journal of Education supported the curriculum of the United States Military Academy at West Point with the contention that a "needy, bustling, impatient country" such as ours cannot afford to devote as much time as "the

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79 American Quarterly Observer, II (1834), 29.

80 Swallow Barn, or a Sojourn in the Old Dominion, ed. Jay B. Hubbell (New York, 1840), pp. 12-13.

81 An Address on Primary Education, Delivered Before the Columbian Peithologian Society, in the Chapel of Columbia College, June 3, 1840 (New York, 1840) pp. 12-13.

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classic writers of the English Augustan age" to ancient literature[82]. Stephen Girard's bequest for a "college for orphans" specified that the French and Spanish languages as well as such practical subjects as physical science and surveying be taught at the proposed institution: "I do not forbid," read the will, "but I do not recommend the Greek and Latin languages."[83] In contrast with knowledge of mathematics and physical sciences, augmenting "the power of man" and shedding their "influence like that of the sun," Dr. Caldwell could find "a knowledge of Greek and Latin" readily indispensable. "To say the least," he wrote,

> its usefulness in the common affairs of life, whether public or private, on a large scale or a small one, is very limited. Were we to deny it altogether, it is doubtful whether we could be convicted of error.[84]

With Dr. Rush, Caldwell would have limited the study of Greek and Latin to professional classical scholars.[85] And Charles Ingersoll anticipates the day when the pressure of utilitarian need will result in the relegation of the ancients to desuetude.

> Their study will be confined probably to a few; and may, perhaps, in the lapse of time, perish under the mass of knowledge destined to occupy entirely the limited powers of the human understanding. While, therefore, we are discussing whether the learning of the ancient languages ought to be maintained, innovating time is settling the question in

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[82] "Reports of the Board of Visitors on the Examination of the United States Military Academy at West Point, June 1827-8-9," IV (1829), 396.

[83] F. Lieber, Constitution and Plan of Education for Girard College, p.17.

[84] Op. cit., pp.127-129,162,166-167.

[85] [illegible] 167

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> spite of unavailing efforts and regrets for the immortal authors of European literature. Thus we may understand why the Latin and Greek languages are less cultivated in America than in Eruope. Unfettered by inveterate prepossessions, the mind, on this continent, follows in its march the new spirit that is abroad, leading the intelligence of all the world to other pursuits.[86]

Even though the North American's reviewer of Ingersoll's address did not quite agree that the classical languages will "perish under the mass of knowledge destined to occupy entirely the limited powers of the human understanding," yet he does hold that "utility is the watchword of American genius" and that the cumulative achievements of the human mind must subordinate less important fields of learning. The most he would ask is that "a remnant may be spared to visit the graves and cull the flowers of antiquity."[87]

When considering educational method, our representative Baconian, frequently imbued with Pestalozzian principles, was equally prepared to condemn the general use of Greek and Latin. He denied that their study constituted wholesome discipline of the mind or was adapted to a stage of intellectual development of the young when memory was strong but reasoning powers yet undeveloped. Nature teaches us, he echoed Pestalozzi and the Edgeworths, that children learn through vigorous application of their senses to the external world--through observation of the concrete. That is nature's (hence the most effective) means of discipline. As decreed

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[86] Influence of America on the Mind, pp.7-9.

[87] "Mr. Ingersoll's Discourse," XVIII (1824), 160-162.

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by nature then, the study of 'things' should precede the study of 'words.' Thus Stephen Girard would not recommend the inclusion of Greek and Latin in the curriculum for Girard College because he would have children "taught facts and things,rather than words or signs."[88] "Rumford" rejects the idea that the study of the classical languages, addressed principally to memory, can strengthen the mind. No, the true invigorators of the intellect are, he contends, mathematics and the physical sciences.[89] "And if the study of Greek and Latin invigorates the 'memory,'" Dr. Caldwell maintained (thinking of what phrenology teaches about the mind), "it is a memory for words, not for ideas of qualities, objects, events or their relations."[90] Were the nation'scolleges to allow students to enter without first requiring a knowledge of Greek and Latin, argued Dr. Jackson, it would "prove a most acceptable reformation to the people"; for then

> science and things would take the place of words and logomachy, and a mighty accumulation of intellect would thus be thrown upon our country, which is now lost on the barren philology of Greece and Rome; and our colleges then would be crowded with industrious students, who might return to their parents, instructed principally in those things which are known to be useful through life, and which use would render permanent in the mind.[91]

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[88] F.Lieber, Constitution and Plan of Education,p.17

[89] Op.cit.,pp.16,79-89.

[90] Thoughts on Education, pp. 138-139.

[91] Op.cit.,pp. 15-16.

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When words *are* to be learned, let them be *English* words--so, as utilitarians, they argued. And they rejected the idea that the study of the ancient languages provided either a necessary or valuable foundation for English grammar and vocabulary; even as they frequently rejected the argument that to form correct taste and style one needed a classical background. In short, they denied the value of the ancients as models of imitation; in fact, revealed a modernist suspicion of all imitation. But these latter points are not germane to the central pattern of Baconian thought being considered here, and they need detain us no longer.[92]

Now this does not mean (as suggested in the opening of the present chapter) that every Baconian was a complete and unqualified enemy of classical learning. True, the hostility of many a "Rumford" or Caldwell reached a point admitting the study of ancient languages only as a field of special philological research for professional scholars (this being in accord with scientism). But the 'liberal tradition,' the

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[92] Of course the controversy regarding the use of ancient works as models of excellence embraced the larger issue of progress: the question whether the ancients had achieved the *beau ideal*, an absolute of perfection, or whether man has since progressed in this respect as in power and knowledge; whether immutable principles of taste governed in literature, or whether here too the principle of cumulative progress obtained. Also, the argument concerning the value of Greek and Latin as a grammatical and etymological foundation could become associated with the idea of progress. Thus Caldwell saw the English language progressing - becoming a richer and more flexible instrument of communication, and in its maturity transcending the need for dependence upon a background of Latin (*op.cit.*, pp. 163-166).

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old-school respect for the gentleman-scholar, persisted still in these years. Mathew Carey distinguished three parties differing on the question:

> The first maintains the idea that this study is essential, not only to cultivate the understanding, refine the taste, expand and liberalize the heart, and impress the mind with a bold and daring spirit of liberty, but, mirabile dictu, to the perfect understanding of the vernacular tongue!
>
> The theory of the second is, that although this study is not only ornamental and useful, but absolutely necessary, to those young men who are intended for the learned professions; and further, that it ought to form part of the education of those whose fortunes afford a rational prospect of being secured from a dependence on trade or business for a support; yet that to those likely to be dependent on either, and who have no chance of a collegiate education, it is a miserable waste of time to attempt to learn both, or, indeed, either of those languages, on the scale, and at the expense of time and labor that are bestowed on them in grammar schools--that is to say, an application of three or four years, committing long Latin passages to memory, and writing themes.
>
> The third party is opposed to the study altogether; principally on account of the demoralizing tendency of the libidinous and profligate career of the various personages of the heathen mythology, from the imperial Jupiter to the filthy Priapus.[93]

With due recognition of his failure to note variant degrees of tepidity in the second group, and barring the limitation of reasons in the third to those "principally" moral, Carey's classification is acceptable. Although he had many years before printed Dr. Rush's denunciation of classical learning in the American Museum, nevertheless, so he tells us, he had disagreed with the latter on the wisdom of an extreme position.[94] Carey expressly placed himself in the second

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[93] "The Learned Languages," So.Lit.Mess., III (1837),11.

[94] Reflexions on the Proposed Plan for Establishing a College in Philadelphia, Preface, p. iii.

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category.[95] And there, too, apparently belong most of the Baconians of the time. The Journal of Education, markedly sparing though it was in defense of classical learning, and carrying the censures upon traditional education of the Edinburgh and Westminster Reviews, nevertheless made it clear that it was moderate in its attitude. "The Journal of Education," expostulated William Russell, "has been more than once spoken of as a publication hostile to classical literature. This mistake," he adds, "we can attribute to nothing else than the hasty and superficial manner of reading periodical works." As for the Journal's true position:

> Classical learning we have always deemed one of the finest means of mental improvement; and of its importance to the professions there is, we believe, but one opinion. In common with others, however, we have doubted the advantage of the indiscriminate teaching of the languages to all the youth of any community, or even to a large proportion. If education is to be useful at all, it must be adapted, in some measure at least, to the probable condition and occupation of individuals. Let all professional men, we would say, and all men of leisure, and all men, in fact, who can afford the time, the money, and the sedentary application, learn the ancient languages. But do not let a father think he is doing right in sending his son to study languages for a very few years at an academy or a college, while the lad is disposed to be a farmer, a mechanic, or a manufacturer, or a merchant,--unless, indeed, all the other, and especially the practical, parts of his education, are in proportion to his literature.[96]

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[95] "The Learned Languages," So.Lit.Mess., p.11.

[96] III (1828),656-657. For other indications of the Journal's attitude see: I,524-539,576,582-594; II,74-89.

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Similarly the Reverend Moses Stuart of Andover (whose opinion was endorsed by the Journal of Education)[97] could favor the study of the classics for prospective ministers, accord it substantial power in enlarging the mind and in developing language skill,[98] but deny that it is necessary for most youths. And the North American's first editor could at one time urge a more thorough foundation in the ancient languages so that the college student might better "relish the beauties" of the classical writers and have "his taste and style" formed thereby; while at another time he could conclude that "a boy's case will not be desparate" if, not being able to "make Latin verses,... he can comprehend a problem of Euclid."[99] George B.Emerson, William Russell, and others--not to mention Thomas Jefferson himself--were zealous in the cause of science and technology but yet maintained their respect, even admiration, for the literary achievement of the Greeks and Romans.[100] Jefferson always considered classical learning the foundation of education, but his University of Virginia was established to provide a complete daedalian as well as literary education;[101] and Jefferson, moreover, was under the influence of

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[97] AJE,III (1828), 657-672.

[98] "Letter on the Study of the Classics," Quarterly Register and Journal of the American Education Society,I (1828), 85-98.

[99] William Tudor, op.cit.,pp.169-170, 336-337.

[100] G.B.Emerson,"On the Education of Females," Amer.Inst. Lectures, 1831, pp.32-36; Potter, Principles of Science, pp 19-20,35-36; "Popular and Liberal Education Combined," AJE, III (1828), 261-266.

[101] Jefferson,Writings,XVII,417,431,436-437; XIX,211-221;

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French naturalistic ideas on pedagogy as well as politics.[102] Walter Johnson,too, though a leader in the struggle for more and better technological education did not exclude 'liberal' studies, principally Latin and Greek, from his category of worthy subjects.[103] And the heads of academies manifested this same dual allegiance (or compromise, perhaps) in their provisions for both "English" and"Classical"departments. Thus at the opening of the South Carolina Society's Male Academy (1827) its principal defended the 'extended English course' with the opinion that "we can rationally

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[Footnote 101,Contd.]

XV,455,471 ("natural rights" of students). Jefferson defended classical learning in a letter to John Brazier, author of a review of Pickering's On Greek Pronunciation (Writings,XV,207-211). In a letter to Thomas Cooper, dated October 7, 1814, he wrote:

> For classical learning I have ever been a zealous advocate; and in this...I was ever opposed to my friend Rush, whom I greatly loved... I have not, however, carried so far as you do my ideas of the importance of a hypercritical knowledge of the Latin and Greek languages. I have believed it sufficient to possess a substantial understanding of their authors.
>
> Ibid.,XIV,200

But compare (from a letter to Elbridge Gerry, January 26, 1788):

> And I am for encouraging the progress of science in all its branches; and not for raising a hue and cry against the sacred name of philosophy; for awing the human mind by stories of raw and bloody bones to a distrust of its own vision, and to repose implicitly on that of others; to go backwards instead of forwards to look for improvement; to believe that government, religion, morality, and every other science were in the highest perfection in ages of the darkest ignorance, and that nothing can ever be devised more perfect than what was established by our forefathers.
>
> Ibid.,X,78.

[102] B.A.Hinsdale, op.cit.,p.598.

[103] "On the Combination of a Practical with a Liberal Course

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ascribe" modern man's "vast pre-eminence" technologically to nothing else but "accurate acquaintance with the mathematics and the elements of natural science"; and that

> to a yet more liberal diffusion of scientific knowledge among the business classes of society, can we alone look for the fulfillment of our brilliant dreams of the future.[104]

But the same gentleman ended with censure of the utilitarian spirit which would exclude classical studies from our seats of learning.

> If then to the plus and minor philosopher of practical life, who admires the genius of Newton, Howditch, and La Place, only in the rapid arrivals on the shipping list, and sees nought but domestic cloths and patent calicoes in the iris which paints the spray that dashes from Niagara, there by nothing useful, nothing adapted to ordinary affairs, in a full command of all the means by which the master minds radiate their fervours through society; let him withdraw his boy from the converse of Academies and Porticoes, and train him exdusively in the dust and the sun; not so mine!

Similarly the Mt.Pleasant Classical Institute at Amherst advertised itself in the same year as preparing youth for business as well as college, offered courses in "Commercial Theory" and natural philosophy as well as Greek and Latin, based its morality firmly on Biblical precept and its pedagogical method of Pestalozzian principles--and declared:

> The mind which has been nurtured in the chastening and purifying atmosphere of truth, may

[Footnote 193,Contd.]

of Education," Op.Cit., pp. 166-168.

[104] William G. Read, An Address Delivered Before the South Carolina Society, on the Occasion of Opening their Male Academy, on the 2nd of July, 1827 (Charleston,1827),pp.6-9.

[105] Ibid.,pp.10-22.

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> not indeed bend in idolatrous worship at the old philosophy, nor chant its morning and evening song in the temple of Grecian beauty; but so long as the principles of beauty, the modifications of emotion and sentiment, and the laws which govern our intellectual operations remain the same, it will never cease to admire, the gifted genius of other ages and nations, embodied in the treasures of classic literature.[106]

However necessary the qualification I have made, it nevertheless should be noted that what so frequently seems to be a Baconian's inconsistency will, upon closer scrutiny, appear to be quite in harmony with what we have already discovered of the Baconian mind; for it is possible to favor classical studies even when (as in the quoted instances) judging them to have only a superficial rôle in life. Reasons and emphasis are everything here.[107] Note that the second (or moderate) position described by Carey actually agrees in general with the 'hard temperament' derogation of classical learning to mere embellishment, to the status of 'polite learning' for those few who can afford the time and money for added polish. In fact, frequently quoted was Locke's opinion that Latin is "absolutely necessary to a

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[106] AJE, III (1828), 235-239, 297-300. Cf. also "The Mount Pleasant Classical Institution," New York Mirror, IV, (1827), 297.

[107] Thus one reviewer of the Harvard controversy of this period, regarding the cultivation of ancient literature: "It is a luxury, while scientific and professional acquirements are necessaries...We look upon it in the light of the 'burnish of a complete man,' and in no other." U.S.Lit.Gaz., II (1826), 445.

> Professor Vethake:
> ...I will very readily grant, that for enjoying some of the noblest and most delightful gratification which can be administered to the mind through the inlet of the imagination, there is no purer and better source than the historians,

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gentleman." Such an attitude, though indicating the persistence of the scholar-and-gentleman tradition and even allowing for utility in professional life, was insufficient to maintain for the study of Greek and Latin any substantial place in the culture of the individual. To the true humanist such a value was as no value at all; to argue it, was not even to recognize the issue. It was concept of the worth of the Greek achievement which, for example, Col. Knapp shared.

[Footnote 107, Contd.]

> Orators, and above all, the poets of antiquity. It is plain, however, that the enjoyment of such advantages as these, imply nothing short of a thorough acquaintance with the ancient languages.

And that, to Professor Vethake, is only for a few. Journal of the Proceedings of a Convention of Literary and Scientific Gentlemen, Held in...New York, 1830, pp.26.27.

> As for Carey's emphasis, it is manifest in the opinion that every young man intended for the learned professions - every person intended for the occupations of a printer or bookseller - every one whose parent's wealth renders it unnecessary for him to apply to any profession or trade, and perhaps some few others, ought to acquire those languages. To such persons they will be not only ornamental but useful, and a source of great intellectual enjoyment.
>
> Reflections, pp.15-16.

It was to be expected that a Baconian who wanted to see education for democracy and usefulness would place classical learning at the periphery of academic work. See, for example, Gallatin's address at the New York University Committee Convention in Journal of the Proceedings...held in New York, 1830, pp. 170-180.

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As one instance: Carey, Reflexions, p.16.

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"What can exceed their permanent fictions?" he asks.

> Their mountains still drop with honey, their springs still flow, and will forever flow, with waters impregnated with inspiration; [109] and their groves are still vocal with song.

Likewise, to a belletrist such as Henry L. Pinckney, the perfection of classical literature is a perfection in the development of fancy and taste; modern man surpasses the ancients, he contends, in those respects--scientific and social and religious--upon which progress depends.[110]

A flourishing state of 'pure literature,' viewed as dependent upon vigorous imagination, could be associated--primitivistically--with the childhood of peoples or, on the other hand, with their degeneracy; neither of which theories providing much comfort or honor to the creative artist. We have already noted the tendency to explain the peculiar 'genius' of the Hellenes by picturing them as adolescents (vid. ante, pp. 107-111). Thus Knapp saw "all the images" in ancient writings "as natural, and all the sentiments" flowing "directly from the heart."[111] And the Analectic Magazine offered the idea that

> in the infancy of society, as in the infancy of the species, Fancy is more alive than

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109 Lectures on American Literature, pp. 31-38.

110 "The Spirit of the Age," in The Charleston Book; a Miscellany in Prose and Verse (Charleston, S.C., 1845), pp. 96-102.

111 Lectures on American Literature, p. 32.

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> Reason; and those effusions of intellect that are addressed to the passions, form the earliest branch of literature, and are best calculated for people susceptible of feeling, but unused to patient and laborious investigation.

This is as true, he adds, of "the savages of ancient Greece, whose exploits are the subject of Homer's ballads," as of "the northern nations" with their Runic poetry." Which primitivistic preconception informs his attitude towards belles lettres generally.

> Poetry and description, uniformly constitutes [sic] the literary amusement of rude and ignorant people in the first stages of society; and poetry and description of more polished fabrication, still continues, and will long continue to form the literary amusement of the multitude in every stage of society; of those, who are every where too listless and too ignorant to appreciate the severer studies by which real knowledge is patiently accumulated and disciplined, and the actual condition of human life substantially improved.

"It is not pretended," he adds,

> that poetry, such as we find it among poets of established reputation is not an allowable amusement, and an elegant relaxation. But as it was in the beginning of society, it now is, and ever will be, that a general prevailing fondness for the science of words, and not of things--for poetry and oratory--for splendid, diffuse, and ornamented diction, whether in verse or in prose, in writing or in speaking, is the sure sign of a comparatively ignorant and uninformed state of society. These constitute the trincallerie, the gaudy, youthful and useless ornaments of literary apparel: ornaments, that as people become wiser, and grow older, are thrown aside as fit only for the giddy, unreflecting, and trifling taste of early years.[112]

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[112] "Journal of the Academy of Natural Sciences," Analectic Magazine XI (1818), 191-192. The author considers the appearance of this journal as evidence of a stand that becomes our national character." Ibid.,p.193.

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The reverse hypothesis is expounded by a writer for the Southern Review in 1829. Here imaginative creation is viewed as excrudescence out of national decay--or, to change the figure, something like the phosphorescent glow of decaying timber. "It has so happened," we are told,

> That the era of the arts, in most countries where they have flourished, has been also that of political decline and downfall, as if genius had reserved her choicest distinctions to be the memorials of departed or at least departing greatness--a 'gilded halo hovering round decay.'[113]

It was "corruption at Athens and Rome that attended perfection in "the arts of ornament."[114]

But there were, of course, ardent defenders of classical learning who insisted upon its indispensability in the education of all youth. And the conflict could become sharply joined on this issue. Carey, for example, was promptly answered in the pages of the Southern Literary Messenger by a faculty member of the University of North Carolina who denied that the study of the classical languages had the limited value Carey attached to them.[115] The controversy over questions of administration, discipline and course of study, which shook Harvard in the years 1824-1825, also involved vigorous discussion of the status of the ancient

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[113] "The Fine Arts," IV,p.70.

[114] Ibid.,pp.70-71.

[115] "The Learned Languages," II (1826),693-696.

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languages and their value in comparison with that of scientific studies.[116] And on the floor of the significant[117] "Convention on Education" held in New York in 1830, under the auspices of the committees working to establish New York University, the modernists again clashed with the friends of classical learning--on the question (one of eighteen proposed for discussion):

> Would it be expedient to connect with a University, established in a large city, and intended to raise the standard of learning, and to embrace, as far as its means would permit, every department of science and literature,--a preparatory college, in which should be taught mathematics, physical and moral science, and English literature, and belles lettres, not to the exclusion of classical learning, but making this a voluntary, instead of an indispensable branch of study?[118]

The resultant discussion covered several meetings, during which Albert Gallatin and Thomas Gallaudet in conjunction with Princeton's Professor Vethake (whose paper was read) defended the proposal that classical studies be no longer required in higher education,[119] and Francis Lieber, supported

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[116] U.S.Lit.Gaz.,II (1825),209-218,441-449.

[117] Among those attending this convention were such notables as Albert Gallatin,S.R.Betts (Judge of the District U.S. Court), Professor Silliman,Dr. Griscom,Gallaudet, Francis Lieber, Jared Sparks, Dr. Dekay,ColTrumbull(President of the American Academy of the Fine Arts), S.L.Knapp and Gulian C, Verplanck. Journal of the Convention,pp.9-13.

[118] Ibid.,pp.168-169.

[119] Ibid.,pp.23-35,169-180,203-207.

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by such educators as President Marsh of Vermont and President Mason of Geneva College, defended the classics against detraction and what they evidently felt to be a campaign to relegate the ancient languages to a minor place in education.[120]

It must be recognized, moreover, that many of the defenders of the classics were not incapable of appreciating the philosophical core of the conflict: the deeper implications of their humanism and of their opponents' naturalism--the implications conveniently (except for the bias manifest) defined for us by Professor John Dewey:

> Humanism may be defined as the conviction that spiritual and ideal values are of supreme rank in the makeup of reality, and that these values are most adequately expressed in the great or classic achievements of humanity in literature and art--especially literature. Naturalism rests upon the conviction that, negatively, humanism is a survival of the geocentric medieval philosophy, with its false conception of the place of the earth and of man in the universal scheme, and with its exaggerated teleological interpretation of things; positively, that man and his affairs are a subordinate part of nature, seen in their true place only when nature is made the chief and primary object of study. Incidentally, naturalism almost always has as one of its implications that language and literature are too artificial, factitious, and, as it were, ornamental, to be a sound basis for education. Science, it is urged, presents mankind with truths concerning realities of existence; language and literature with man's accidental and fanciful relations to these realities.[121]

Interestingly, the first article in Woodbridge's American Annals of Education revealed an awareness, with some objectivity, of the historical development and preconceptions of

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[120] Ibid., pp.207-216.

[121] "Humanism and Naturalism," in Cyclopedia of Education, III,338-339.

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the two movements thus defined by Dewey. The writer for the Annals arrayed, as opposed to the "Humanists," both "Philanthropists" and the "Pestalozzian school," with a "Productive" (or "Eclectic") school avoiding either "extreme."[122]

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122 "Progress of Education in Germany and Switzerland," I (1831),9-16. The underlying issue was clearly discerned by the writer in the North American who declaimed in connection with the spirit of the Edgeworths' teachings:

> An over anxiety to make of babies, little matter-of-fact men, and unbreeched philosophers, will add but little to their sum of knowledge in after life, and nothing to that faculty which teaches them to consider and determine for themselves, and begets that independent wisdom, without which their heaped up knowledge is but an incumbrance [sic]. A child, now, 'learns by heart' how a shoe is made, from the flaying of the ox for the leather, to the punching of the last hole; and can give the best of reasons for its being so made, when it had much better be chasing a rainbow. Such a system maymake inquisitive, but not wide ranging minds. It kills the poetry of our character, without enlarging our philosophy; and will hardly make us worthier members of society, or give us the humble compensation of turning out better mechanicks.
>
> We do not mean by this, that those faculties and acquisitions, which rank as the merely useful, should not be cultivated with care; but that they should be mingled with, and partially concealed amidst the growth of higher powers. For it is not those alone that send a healing influence up through society; but the latter, too, shine out over the world, and in their splendor is warmth, and life, and joy. Poetry is no less necessary to society, than well ordered industry; and feelings, akin to it in the lowest of our race, will lift up their thoughts, and purify their hearts. Society should be like the earth about us, where the beautiful, the grand, and the humble, lie spread out, and running into each other.

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For their part, as I have suggested, many of the defenders of classical learning in early nineteenth century America may without equivocation be termed humanists. Hugh Swinton Legaré (South Carolina's 'genuine classique'), Harvard's Professor Popkin, Cornelius C.Felton, William Howard Gardiner, James Kent, Justice Joseph Story, George Tucker and others[123] may be placed in that category. In their polemic they maintained that fundamental values--intellectual, ethical, aesthetic--are immutable; that the ideas and forms expressing these values are of primary importance ('facts' or'things' properly subordinate); that man's material progress did not alter the fundamental values, did not render unnecessary their guidance in applying 'power,' did not displace the classics as their highest expression, and hence had not rendered the latter dispensable as agents for disciplining and humanizing: that as man does not live by bread alone, but needs the cultivation of his higher powers, so he needs the truth, goodness and beauty which is his heritage from the past--and above all from Greek and Roman literature.

As further qualification, moreover, it must be pointed out that among those who supported the Baconian cause, took up the Promethean theme and espoused the extension of science and technology in education, were some who at the time were

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[123] See bibliography; also under: George W.Bethune,Nehemiah Cleaveland, Alpheus Crosby,Convers Francis,Francis C.Gray, John T.Irving,Lucian Minor,Nathaniel F.Moore,Richard Ray,Robert Walsh,George Watterston.

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convinced of a need for the cultivation of the spirit of man by humane letters and the fine arts; in short by a liberal education. Of these a notable example is the Reverend Alonzo Potter whose Baconian bias we have already noted, but who also insisted that thedaedalian arts have as "their immediate and most palpable use...only to increase the outward or physical comforts and accommodations of mankind," whereas the "liberal arts" have as their "direct object"

> to move and elevate mind...enlighten reason, gratify taste, fill the imagination with visions of ideal beauty or greatness, and incite the will to high and holy resolve.[124]

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[124] Principles of Science, pp.19-20. Cf. also: "American Scholarship," U.S.Lit.Gaz., I (1824), 234-235; D.D.Barnard, An Address Delivered before the Philoclean and Peithessophian Societies of Rutgers College, at the Request of the Philoclean Society, July 18th, 1837, Albany, 1837; D.D.Barnard, A Discourse Pronounced at Schenectady, before the New York Alpha, of the Society of Phi Beta Kappa, July 25th, 1837, Albany, 1837 (other works of Barnard reveal his associated Baconian traits); Joshua Bates, "An Inaugural Oration, Pronounced March 18, 1818, "printed in The Academician, I (1818), 83-89; James Gould, An Oration, Pronounced at New Haven, before the Connecticut Alpha of the Phi Beta Kappa Society, September 13, 1825, New Haven, 1825; W.E.Channing, Works, I, 381-383; II, 347-411; IV, 67-103; P.Lindsley, Life and Works, I, 13-16; III, 27-29, 81-152; Henry S.McKean, "On the Ends of School Discipline," Amer.Inst. Lectures, 1835, pp.131-152; S.L.Mitchell, A Discourse on the State and Prospects of American Literature; Delivered at Schenectady, July 24th, 1821, before the New York Alpha of the Phi-Beta-Kappa Society, Albany, 1821; "Obstacles to the Progress of Knowledge," Christian Examiner, VIII (1830), 99-115; [Jared Sparks], "Appropriation of Public Lands for Schools," N.Am.Rev., XIII (1821), 335-338; William B. Sprague, Letters on Practical Subjects to a Daughter, New York, 1831; W.B.Sprague, An Address Delivered on the Evening of December 4, 1838, before the Young Men's Association for Mutual Improvement in Albany, as Introductory to Their Annual Course of Lectures, Albany, 1838.

Among the above there is at times an express desire to see less concentration upon classical learning, but precedence

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Of course there was nothing inherent in either position to render impossible a blending of attitudes--a synthesis based upon recognition that man is more than his knowledge of 'things,' though to an appreciable extend conditioned by that knowledge; in brief, that man hath all which Nature hath, but more.[125] It remained for Ralph Waldo Emerson to achieve the highest expression in America of just such a synthesis.[126]

[Footnote 124, Contd.]
given to spiritual ideals and humane letters as the source of guidance and inspiration to living according to those ideals. On the other hand, that a strong humanist disposition to favor classical learning might be weakened by Baconian demands is illustrated by Francis Lieber, who, despite being jealous of any attempt to restrict classical learning in general education, was moved to argue in favor of the Girard plan for a 'practical'seminary. Even in his proposals for Girard College he does not have the heart to omit altogether Greek and Latin (although expressly not recommended by Girard), but would make them optional. I cannot discern in Lieber (as others with his attitude) what might be called a synthesis, since the Baconianism and humanism remain unmodified by each other - are dissociate - thus indicating merely an invasion by the Baconian of his humanist position. Cf. Lieber's Constitution and Plan, Journal of the New York Convention, pp.207-212; "Remarks on Philology," So.Lit.Mess., III (1837), 161-172.

125 See Appendix X, p. xxv.

126 In the "American Scholar" Emerson combines his individualism and his insistence upon immediate experience of reality, with recognition of the value of books when the Wisdom and beauty they contain are rendered vital by the "active soul." Further, although he urges the life of action, he also emphasizes the need for meditation; and he insists upon discipline through nature, rather than submerged in nature - although nature is the "print" to the "seal" of spirit. "Emerson's address on the American Scholar," wrote Irving Babbitt, "is a plea for a humanism that shall rest on pure intuition; the only drawback to Emerson's programme is that he assumes genius in his scholar, and genius of a rare kind at that." Literature and the American College, p.98. The synthesis to which we have here alluded may well be termed humanism. It represents a desire to include in a view of life, the whole of human experience.

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Part Three

Four Representative Baconians

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CHAPTER I

Edward Everett, Herald of Baconian Progress

In 1815 Edward Everett, not yet twenty-one, assumed the chair of Greek literature at Harvard, and thus brought a Baconian mind into the classical department of the nation's foremost institution of learning. Doubtless young Everett felt that a lifetime devotion to ancient poets and philosophers afforded insufficient compensation; for he left Harvard in 1825 to begin a political career leading to the governorship of Massachusetts and to a ceaseless pouring forth of occasional addresses[1] that unfolded the Baconian vision of the brave new world. Examining these addresses, so often mere rhetorical display and shallow pedantry, we begin to appreciate keenly how the sense of a world of science and technology, of bustling activity, of 'hard facts' and utility, of more and still more power and progress, could dwarf the meaning of classical learning.

Not that Everett denied value to the study of the

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[1] As to their contemporary popularity, see "Everett's Orations," New York Review and Atheneum, I (1825), 334; U. S. Lit. Gaz., I (1824-25), 194-196, 311-312; N. Am. Rev., XX (1825), 417-440.

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ancient classics, or to humane letters generally. But the very value he grants them is significant - and certainly not incompatible with Baconian principles. It is true that in 1846, when delivering his inaugural address as president of Harvard, he felt called upon to explain that our "system" holds the classical studies and sciences "in equal respect as means to the same great end; and ascribes to them equal importance as branches or parts of an academical system."[2] Nevertheless when he proceeds to explain their function, classical studies are at once seen to be rendered not only subordinate but actually dispensable. The principal virtues he ascribes to them would have incurred the objection of but few Baconians: ancient literature, in brief, gratifies the aesthetic sensibilities, ornaments the mind, and, collateral with professional studies, provides a tool - principally philological. For polish, for refinement of taste, Everett would without reservation recommend the ancient classics.[3]

Admittedly, he argues also that linguistic study provides intellectual discipline - that it offers, as he puts

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[2] Orations and Speeches, II, 509-510. Hereafter, the volume and page reference alone will be used.

[3] II, 504; cf. also "The History of Grecian Art," N. Am. Rev., XII (1821), 187-188; "Essays by a Virginian," N. Am. Rev., XVI (1823), 50-54.

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it, "no mean exercise in logic;"[4] moreover, that "the study of language in its highest form is the study of the processes of pure intellect."[5] But at the same time he feels that as a means of developing reason, it is merely a useful adjunct; in fact, "that an eminently accurate practical mind is hardly to be formed without mathematical training."[6] Further, although contending that the study of language is the study of the intellect itself, he really places the power thus gained in "the region of poetry, eloquence, and wit."[7] It is primarily an emotional and aesthetic subtilizing that he promises. Even when Everett seems momentarily to recognize a general edification in communing "with the most gifted minds," the influence is again related to our sensibilities: we may be "elevated to ... sympathy," may become "in some degree, partakers of their inspiration."[8] In any case, his attempts to defend classical learning are fragmentary, and suggest that he does not have his heart wholly in the effort. His arguments are unsystematic, made up primarily

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[4] II, 510.

[5] II, 508.

[6] II, 510.

[7] II, 508-509.

[8] II, 509.

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of passing allusions to the utility of philology, the beauty of a refined style, and the emotional power of language skillfully employed. True, in this last connection, by acknowledging the power of eloquence over the heart, Everett acknowledges moral efficacy; but as a Baconian of 'hard temperament' he believes that "moral education is much too important to be left to follow as an incidental effect from mere literary culture."[9] For this purpose he would prefer to have a rigorous Christian education, consisting of instruction in "the great truths of natural religion, in the principles of Christian ethics, and the evidence of the Christian revelation, under the guidance of text-books."[10]

Everett could always be depended upon to please his audience, and this was a pious New England audience. One might well have anticipated something else from the gentleman who had once held a chair in Greek literature; but nowhere does Everett take cognizance of the humanist contention that great literature is an enduring source of moral and intellectual guidance and inspiration. Everett's

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[9] II, 513.

[10] II, 515. Moreover, Everett was not even consistently impressed by the value of aesthetic experience. Writing for the N. Am. Rev. in 1831 (p. 21), we find him, although willing to admit the excellence of Greek statuary, yet judging them mere "elegant vanities."

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views on the nature of truth and progress actually preclude such a postulate. The humanist, consciously or otherwise, assumes that truth is not merely an empirically ascertained fact of the external world, supposedly corresponding to a representation of itself in human experience. Rather, he conceives of truth, intellectual, aesthetic and moral, as a reality achieved through the coagency of imaginative (or intuitive) insight and reason operating upon facts or experiences in the external world. In other words, to the humanist, truth is fundamentally interpretation of data. And interpretation, product of a distinctly human power, is guided by criteria emanating from spiritual sources, from the realm of absolutes. These criteria - external and immutable truths - might be comprehended by a powerful intuition at any time. They were changeless amid change. Hence, the humanist contention that what was truth, goodness and beauty for antiquity, is such also for us; and that no matter when produced, a great piece of literature is always to be read, because it represents the means of communicating the power of truth, the power of conduct and the power of beauty to all generations of men. Thus for the humanist, literature (and precisely because it is the product of imaginative insight) becomes one of the most effective instructors of men.

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The nationalistic Baconian, on the contrary, places truth in the domain of the intellect, and associates the senses in some vague way with its reception and formulation. Consequently for him (as will appear when we examine Everett's views further), the ultimate source of truth becomes data of the external world; and hence it is not surprising that the very data should become identified with truth, and science, or the inductive method, by which the data is accumulated, proclaimed the Light of Truth. Man's increasing power over nature becomes the palpable evidence that we have the truth. "It is through mind," proclaimed Everett,

> that man has obtained the mastery of nature and all its elements, and subjected the inferior races of animals to himself... it is the mind of man, possessed of the necessary knowledge and skill, that brings into useful operation, for the supply of human want, and the support and comfort of human life, the properties and treasures of the natural world, the aid of inferior animals, and our own physical powers.[11]

And

> when, therefore, we improve our minds by the acquisition of useful knowledge we appropriate to ourselves, and extend to others to whom we may impart our knowledge, a share of this natural control over all things which Providence has granted to his rational children.[12]

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[11] I, 310.

[12] I, 310-311.

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Hence Everett urges that education must not neglect the "nurture of the mind," for thereby man extends his control over nature. The diffusion of useful knowledge means the difference between barbarism and civilization. "Why," he asks,

> has the red man failed, and the white man waxed strong? Why have we multiplied by thousands and hundreds of thousands, while they have disappeared from plain and hill-side? ... In most of the capacities and powers of the physical man, they not only equalled, but excelled, the European race. ... In physical vigor and endurance, he was an overmatch for his pale-faced rival. But
>
> 'His soul proud Science never
> taught to stray
> Far as the solar walk or milky way.'

He "wanted the arts," wanted "not walls and bulwarks, but the elements of useful knowledge."[13] The red man wanted the devices, fruit of science and technology, which, for example, surrounded Everett as he delivered an oration at the fourth annual fair of the American Institute of New York:

> It is these ingenious and useful arts, - the product at once and the cause of civilization, - acting upon society and themselves in turn, carried to new degrees of improvement and efficiency by social man, till they have been brought to the state in which we find them in these halls, - it is these which form the difference between the savage of the woods and civilized, cultivated, moral, and religious man. It is, then, not merely a display of ingenuity

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[13] II, 278-279. These remarks were made at a county convention of the friends of education, held on the island of Martha's Vineyard in 1838. Cf. also II, 241-244.

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> that we witness; not merely an exhibition of productive industry, or a promise of public wealth; but it is the fruit and assurance of the civilization of the human family. ... These arts are now, as they have always been in every age, a representative of human civilization; and the moral and social improvement of our race...[14]

Naturally, a New England Baconian would not have failed to insist that the difference between civilized and savage man involved moral as well as intellectual and material factors. "It must not ... be supposed," he cautions,

> from the [mechanical] instances I have chosen to show the amount of good which may be done by the exercise of the mental powers, that it is confined to the material comforts of life - to steamboats, looms, or machinery for spinning. Far from it. The true and most peculiar province of its efficacy is the moral condition.[15]

"I would be the last," he confesses at another time,

> to undervalue the importance of moral and intellectual influences, or to seem to give undeserved countenance to the mechanical tendency of the age. On the contrary, I look upon the intellectual and moral influence of the useful arts as the most important aspect in which the subject can be contemplated.[16]

Their moral influence he conceives to be co-extensive with the power over matter which they afford. Scientific data (or 'truths') being cumulative, morality in man too

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[14] I, 71.

[15] I, 313, 325-326.

[16] II, 248-249.

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becomes perfectible, and by their agency. "Man," he argues,

> as a rational being, is endowed by his Creator with two great prerogatives. One is, the control over matter and inferior animals, which is physical power; the other, the control over kindred mind, whish is moral power, and which, in its lower forms, is often produced by the control over matter; so that power over the material world is, practically speaking, a most important element of power in the social, intellectual, and moral world. Mind, all the time, is the great mover, but, surrounded, encased as it is with matter, acting by material organs, treading a material earth, incorporated and mingled up with matter, I do not know that there is any thing but pure, inward thought which is not dependent upon it: and even the capacity of the mind for pure thought is essentially affected by the condition of the material body, and by external circumstances acting upon it.[17]

Accordingly, the agencies that implement the knowledge which is power,[18] are directly responsible for social

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[17]II, 239.

[18]Everett was vividly conscious of the power of the machine. At one point, the locomotive itself becomes for him the grand symbol of the brave new world:

> The rapt prophet, in describing the approaching glories of the millennial age, can select no higher imagery than this: 'Let every valley be exalted, and every mountain and hill be brought low;' and what other process have our eyes this day beheld, from the ocean to this first resting-place on the pathway to the West? ... And the power which put all in movement, - most wondrous, - in a few buckets of water, like that which, while I speak, is trickling from yonder homely fountain ('the tank in the spacious car-house in which the company was assembled').
>
> "Opening of the Railroad to Springfield," II, 365.

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melioration. The "control of mind over matter," he writes,

> is principally effected through the medium of the mechanic arts, taking that term in its widest acceptation. The natural faculties of the human frame, unaided by artificial means, are certainly great and wonderful; but they sink to nothing, compared with the power which accrues from the skilful use of tools, machines, engines, and other material agents.[19]

Hence we are led "to the conclusion, that the mechanical arts are the great instruments of human civilization."[20] True, Everett acknowledges, Christianity itself has been "one of the most powerful instruments of civilization," but its true principles were regenerated only when men had begun to advance intellectually: the Reformation came when the "mariner's compass and the invention of the art of printing had furnished the modern world with two engines of improvement and civilization."[21]

That Everett possessed faith in the power of science and technology to ensure mental and moral improvement is everywhere evident in his pronouncements. As we have just seen, he does not scorn the well-worn example of the printing press shedding knowledge and morality as the heavens the rain.[22] In the world's Newtons, Arkwrights,

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[19] II, 239-240.

[20] II, 241.

[21] I, 56-58.

[22] I, 58, 426: II, 249-254. "If I mistake not,"

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Franklins and Fultons - those recurrent symbols of the modern Prometheus - he sees a promise of the degree of elevation which the human race may achieve directly through the intellectual discipline of scientific and technological investigation.[23] Furthermore, such investigation can, he argues, by resulting in a reduction of the "labor and time necessary for the supply of human wants,"

> raise the standard of comfortable living, increase the quantity of leisure time applicable to the culture of the mind, and thus promote the intellectual and moral progress of the mass of the community.

"That this is the general tendency of a progress in the useful arts," he adds, "no one can doubt, who compares the present condition of the world with its condition in the middle ages."[24] Moreover, he contends, science through the useful arts enhances the effectiveness itself of the moral impulses of men. They can perform more good, if physical obstacles are lessened. Thus, for example,

> by means of a watch, punctuality in all its duties, which, in its perfection, is one of the incommuni-

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[Footnote 22, contd.]

writes Everett of the printing press,

> the trumpet voice of truth from this machine, is yet destined to reach to distances and depths of society which have hitherto remained unexplored and neglected.
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> II, 249.

[23] I, 276-282, 303-305; II, 246-247.

[24] II, 249. Cf. also II, 254.

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> cable attributes of Duty, is brought, in no mean measure, within the reach of man.[25]

"In a word," proclaims Everett,

> the products of art are the creations of rational mind, working, with intelligent and diversified energy, in a thousand directions; bounding from the material to the moral world, and back from speculation to life; producing the most wonderful effects on moral and social relations by material means, and again, in an improved political and moral condition, finding instruments and encouragement for new improvements in mechanical art. In this mighty action and reaction, we are continually borne on to results the most surprising. Physical and moral causes, and everything discovered tends to the discovery of something yet unknown.[26]

As for science itself, it

> must be regarded as forming the grandest study of which the mind is capable, and as eminently calculated, for this reason, to give it strength and elevation. The vastness and multitudes of the heavenly bodies, which form, for instance, the subject of astronomy ...; the grandeur of the laws which it discloses and applies; the boundless distances which it spans; ... impart a solemnity to this branch of science, which lifts the soul to the heavens. It is, indeed, the glory of science, in every branch, that it gives life and beauty to every thing which it touches. It ...
>
> > 'Finds tongues in trees, books in the running brooks, sermons in stone, and good in every thing.'[27]

This expression of sentimental and religious naturalism is promptly followed by Everett's declaration, already

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[25]II, 250-252. This idea is fully elaborated by Everett in the cited pages.

[26]II, 253.

[27]II, 511.

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noted, that literary culture alone is not a trustworthy source of moral discipline.[28] Not that Everett is always consistent. For instance, endeavoring to convince workers that literary gentlemen, too, are valuable to society, he asserts that a writer of Scott's character, "who animates the principle of goodness within us by glowing pictures of struggling virtue" in books which we may read without having our "morals poisoned,"

> ...has rendered a service to the public greater even than his who invented the steam engine or the mariner's compass.[29]

However, ignoring the probability that he was at this point swept away by the rhetorical need of the occasion, Everett has given us ample evidence of his conviction that not only the state of morals, but of literature itself, at any period is conditioned by the state of science and the arts. For literary merit, even as intellectual and moral enrichment, is assumed to be dependent upon the accumulation and diffusion of truths drawn from the investigation of natural phenomena. It should be noted that he denies the primitivistic assumption that great literature must issue from the natural, unspoiled imagination and heart - rejects the "prevalent notion"

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[28] II, 513.

[29] I, 302-303.

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> that the infancy of science is more congenial with poetry; and that, in general the period of classical learning is unfavorable to the development of strongly-marked original talent.

That "the first age was necessarily the best," he pronounces a proposition as degrading as it is unsound."[30] An enlightened education - an education imparting the scientific truths uncovered in recent years - would even have improved, "redeemed from their faults," such "eminent minds" as Homer and Shakespeare.[31] Indeed, he insists,

> truth is the great inspirer, the knowledge of truth the aliment and the instrument of mind, the material of thought, feeling, and fancy.

Not that "there is no beauty in poetical language founded on scientific error;" thus it is "consistent with poetry to speak of the rising sun, or the arch of heaven." But nevertheless,

> as knowledge extends, the range of all imagery is enlarged, poetical language is drawn from a wider circle, and, what is far more important, ... the conception kindles by the contemplation of higher objects.[32]

Truth, empirical and cumulative, elevates man as it extends; it broadens his mental horizon, expands his heart and stimulates his imagination. And literature, its

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[30] II, 215, 509.

[31] II, 207-215.

[32] II, 216.

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aesthetic repository, is effective in proportion as the quantity of truth it contains!

> Now, I cannot but think that, when the sublime discoveries of modern astronomy shall have become as thoroughly wrought into the vocabulary and the intelligence of the community as the humble and erroneous conceptions of the ancients, the great and creative minds will derive from them a vastly grander range of poetical illustration. I cannot but think that, by the study of this one science alone, thought, speech, and literature, will be wonderfully exalted. This is not, in reference to poetry, a mere matter of poetical imagery. The ideas formed of divine wisdom and power, of infinite space, of stupendous magnitude and force, and of the grandeur and harmony of the material universe, are among the highest materials of thought, and the most prolific elements of poetical conception. For this reason, in the same proportion in which the apparent circuit of the heavens has been enlarged, and the science of astronomy extended, by the telescope, the province of imagination and thought must be extended also. The soul becomes great by the habitual contemplation of great objects.[33]

As a moral agent, Scott may be superior to a steam engine; but Scotts are made possible, in the first place, by steam engines[34] - among other things of the same nature. "What affects the man, affects the literature," wrote Everett.[35] And his faith was strong in the power of

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[33] II, 216-223.

[34] For paeans of the steam engine by Everett, see I, 271; II, 244-245, 297-298.

[35] I, 20. See this address in its entirety for Everett's concept of the close association of material conditions of life with the status of literature ("The Circumstances Favorable to the Progress of Literature in America," pp. 9-44).

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Baconian knowledge. Even the telescope was to him a moral agent; and he could "feel that there is a holy philosophy in the arts of life, which if [he] cannot comprehend [he] can reverence."[36]

There is, however, for Everett as for Baconians generally, another prerequisite for the unlimited progress of the human race: universal and utilitarian education. The knowledge which is power must be diffused. The failure of antiquity and of the Middle Ages is to be laid to a "want of the diffusion of information among practical men."[37] Not only was knowledge in those periods limited,[38] but limited to a few persons - which was not only an impediment to progress, but a violation of the right of all men; since the mind is endowed by God upon everyone regardless of class or wealth. Even the humblest, declared Everett, have contributed to the advancement of civilization. And, of course, America was in the vanguard

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[36]II, 249-250.

[37]I, 247-248.

[38]I, 601:
There is probably not a newspaper of any character, published in the United States, which does not, in the course of the year, convey more useful information to its readers than is to be found in the twenty-one folios of Albertus Magnus, light as he was of the thirteenth century.

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of this 'march of mind' and of freedom.[39]

It was a glorious prospect that inspired Everett's oratory: truth upon truth discovered by the light of science, applied and spread by the magic of the arts - borne over the earth to elevate progressively the races of men. "We cannot doubt," he announced

> that truths, now unknown, are in reserve, to reward the patience and the labors of future lovers of truth, which will go as far beyond

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[39] "Importance of Scientific Knowledge to Practical Men, and the Encouragements to its Pursuit," I, 246-282; "Advantage of Scientific Knowledge to Working Men," I, 307-328; "The Education of Mankind," 404-441; "Education Favorable to Liberty, Morals, and Knowledge," I, 599-633; "Superior and Popular Education," II, 206-234; "Education the Nurture of the Mind," II, 273-280. On America as the 'beacon light of the world,' see "The Principle of the American Constitutions," I, 103-130; "The History of Liberty," I, 150-172. The "importance of popular education in a republic" is also argued by Everett, II, 312-320. Cf. also on these ideas, including the relative social inferiority of ancient states: I, 12-15, 22-27, 34-39. It was Everett's opinion that,

> when we consider the laws of the human mind, and the path by which the understanding marches to the discovery of truth, we must see that it is the necessary consequence of the general extension of education that it should promote the progress of science.
>
> I, 616

Imperfect human institutions, he argues, hinder the operation of the law of progress; thus,

> thousands and millions of rational minds, for want of education, opportunity, and encouragement, have remained dormant and inactive, though surrounded on every side by those qualities of things, whose action and combination, no doubt, still conceal the sublimest and most beneficial mysteries.
>
> I, 276-277.

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> the brilliant discoveries of the last generation as these do beyond all that was known to the ancient world. The pages are infinite, in that great volume which was written by the hand divine; and they are gradually to be turned, perused, and announced, to benefited and grateful generations, by genius and patience... The progress which has been made in art and science is, indeed, vast. We are ready to think a pause must follow; that the goal must be at hand. But there is no goal; and there can be no pause; for art and science are, in themselves, progressive and infinite. They are moving powers, animated principles; they are instinct with life; they are themselves the intellectual life of man. Nothing can arrest them which does not plunge the entire order of society into barbarism.[40]

"I see," he announced on still another occasion,

> a thousand causes at work to hasten the civilization of the world. I see the interest of the commercial nations enlisted in the cause of humanity and religion. I see refinement, and the arts, and Christianity, borne on the white wings of trade to the farthest shores... I behold a private company, beginning with commercial adventure, ending in a mighty association of merchant princes, and extending a government of Christian men over a hundred millions of benighted heathens in the barbarous East... When I behold all these active causes, backed by all the power of public sentiment, Christian benevolence, the social principle, and the very spirit of the age, I can believe almost any thing of hope and promise.[41]

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[40] I, 275.

[41] I, 434-435.

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CHAPTER II

Horace Mann, Baconian as Educator

Horace Mann, whose spirit still moves and has its being in the American school system, was the Baconian educator at his moral and strenuous best. From the time of his appointment, in 1837, as secretary to the Massachusetts Board of Education, he labored assiduously and successfully to have pedagogical aims and methods conform with his fundamental tenets: the innate goodness of man and the power of science and technology. His faith in the future of humanity was supported by faith in an education allied with natural law. For he saw in nature, truly known, the source of power over man's life; and truly felt, the source of the 'moral affections' to guide that power aright. The scientific mind and the uncorrupt heart were to characterize the men and women of the brave new world.

Mann had arrived at his scientific and sentimental naturalism only after some hard wrestling with the spirit of Calvin. His childhood at Franklin, Massachusetts, had been darkened by the Calvinist teachings of his parents

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and of the Reverend Emmons, a "hyper-Calvinist."[1] But by the time young Mann graduated Brown he had already, it seems, freed himself from the oppressive sense of a vale of sorrow and sin; for we find him in 1819 delivering a commencement oration on "The Progressive Character of the Human Race."[2] By his own account he was but twelve when his emancipation began to take place--when "in an agony of despair" he "broke the spell that had bound" him to the theology of his fathers. From the day of that occurrence, he wrote,

> I began to construct the theory of Christian ethics and doctrine respecting virtue and vice, rewards and penalties, time and eternity, God and his providence, which, with such modifications as advancing age and a wider vision must impart, I still retain, and out of which my life has flowed.[3]

That altered philosophy out of which his life now

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[1] Life and Works (Boston, 1891), I, 9, 13-14. Hereafter the volume and page reference alone will be given.

[2] I, 28.

[3] I, 15. Cf. also I, 48-51, where we find a letter from Mann to his sister urging her to relinquish the Calvinist doctrines that cause her so much unhappiness, pointing out the 'justice' of the view that love for mankind is love for God, and that it would not be within the nature of the Creator to plan "endless misery" for his creatures. "My nature," he exclaims, "revolts at the idea of belonging to a universe in which there is to be never-ending anguish" (p. 49). Can we not trace his aversion to a Calvinist scheme of things in his deep animosity toward traditional authority and aristocratic pretension?

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flowed, revealed aversion to Calvinism; it was a philosophy that had its source in a conviction of the essential goodness of man and of his power to achieve spiritual rectitude by adhering to the natural laws operative on the moral as on the physical plane of being. These were fundamental preconceptions in Mann's educational philosophy. It followed (even as with Robert Owen) that evil was caused by habits of living and social institutions that warped the soul away from its natural conformation. To produce persons standing upright in the sight of God, we must then go to nature. There are moral laws and there are physical laws, but they are all nature's laws to Mann. And moreover the physical, the moral and the religious are inextricably joined: Law for thing and law for man are not discrete.

This must be remembered whenever Mann is found writing of morality and religion in what seem to be the phrases of traditional theology. Labels persist even when their content alters. Mann was, in fact, akin to the transcendentalist who naturalized the spirit. However, it was the Scottish school he followed when postulating an innate moral sense and rooting this intuitive power in nature.[4] But the moral essence of man was not

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[4]Cf. II, 112-120; V, 25-29. Scotch philosophy also

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only naturalized; it was sentimentalized as well. Nature, uncorrupted, became the source of currents of feeling manifest in the 'moral affections,' which Mann often seems to have viewed as equivalent to benevolence or philanthropy. He speaks of the universal and eternal "law of charity and benevolence ... which results from our very structure, organization, and wants," and which "sends out from our bosom, in every direction, a living nerve, that reaches the circumference of being."[5] Writing in his "Journal" after a visit to the Worcester Hospital, Mann remarks that only "the conviction of having done something for the alleviation of others" makes "the burden of life" bearable; and he adds:

> Surely Nature sends no such solace for our own sufferings as when she inspires us with a desire to relieve the sufferings of others. How wonderfully she has linked the feeling of self-restoration with an efficient desire for the restoration of others![6]

It is not surprising, then, that Mann should echo Wordsworth, with the wistful sentiment that,

> could the social and benevolent affections bind

[Footnote 4, contd]

provided the idea that the 'moral sense' requires the guidance of the intellect. Mann is in agreement with the common sense school on that also. Vid. pp. 228-231.

[5] V, 27.

[6] I, 68.

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> the energies of men in an alliance for their advancement, our common nature would no longer suffer under the ignominious but uncontroverted remark, that while we look forward to age for wisdom, we must look backward to childhood for happiness.

With such a moral state of things achieved,

> no longer would it be quoted, as a proverb, that, while the rational powers gain strength and solidity with advancing years, the generous impulses of youth become dormant, its sympathies irresponsive, and the currents of affection, which in early life overflow on every side, soon gather themselves into fewer and narrower channels, until at last the waters are exhausted, and the fountain is sealed.[7]

Thus while retaining spiritual import, the benevolent affections in Mann's sentimental ethic are nevertheless seen to be a process of the 'natural' human constitution. The spirit is rooted in nature, whence direct, intuitional communication.

At the same time, still concurring with the Scottish philosophers, Mann held that nature exerted its salutary influence also through the agency of intellect. The Scottish philosophers for all their sentiment, for all their talk about the 'moral affections,' never discounted hard reason. Neither did Horace Mann. He too saw human betterment in large measure the responsibility of mind. In the first place he was an advocate of

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[7] V, 35-36.

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'natural religion' with its promise of religious edification through the intellectual process of discovering causal relations in nature. Further, he possessed the general faith of the Baconian in scientific and technological knowledge to advance man physically, intellectually and morally.

As for natural theology (Mann preferred the term 'natural religion') he maintained, in fact, that through nature lay an even surer path to nature's God than through revelation. Prompted by a review of Lord Brougham's Discourse on Natural Theology, he wrote in his "Journal" for 1837:

> I know it is thought by man, perhaps by most professing Christians, to be a fatal heresy, and worthy of being purged by fire; but, for myself, natural religion stands as pre-eminent over revealed religion as the deepest experience over the lightest hearsay. The power of natural religion is scarcely begun to be understood or appreciated. The force and cogency of the evidence, the intensity and irresistibleness of its power, are not known, because its elements are not developed and explained. It gives us more than an intellectual conviction,--it gives us a feeling of truth; and however much the lights of revealed religion may have guided the generations of men amid this darkness of mortality, yet I believe that the time is coming when the light of natural religion will be to that of revealed as the rising sun is to the day-star that preceded it.[8]

In Mann's opinion the weakness of revelation was the

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[8]I, 67-68.

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strength of natural science. Mild amusement was his reaction to what he accepted as the bearding of Moses by the geologist.[9] Unlike most in his day, he did not find it necessary to assume agreement between science and Scripture. Hence without anxiety over the fate of the Bible, Mann could wholeheartedly recommend the study of natural phenomena as handmaid to piety. He knew, for example, of nothing

> better fitted to enforce upon us a lively conviction of the wisdom and goodness of God, than a study of our physical frame, its beautiful

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[9]"I have just been listening to a course of lectures on geology," he once wrote to George Combe.

> This is truly a magnificent science. It has kept my causality and veneration in a state of great activity... The fact that made it most delightful to me was, that many of our granite, felspar, hornblende, and mica State Orthodox attended; and before all these, the lecturer, who is known to be one of the elect, assaulted, bombarded, battered, and demolished the six-days' account of the creation, until I sometimes fancied I could hear Moses himself crying out, "Et tu, Brute?" Probably they would not have heard the same thing from any other man extant. He not only enlarged the creation immensely, but he reduced the Deluge to a mere puddle. He said there was not an existing phenomenon on earth which could certainly be traced to it. All this broke up through the primary and secondary formations of bigotry, just as his own volcanic fires rushed up through the corresponding geological strata... He attempted to reconcile himself to Moses; but that made one think of the two men (is it not in 'Gil Blas'?) who shook hands, and were enemies ever afterwards.
>
> I, 123-124.

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> adaptations and arrangements, the marvellous powers and properties with which it is endowed, and the conditions indispensable to its preservation in a state of vigor, usefulness, and enjoyment.[10]

Again, Mann's belief in the moral efficacy of science and technology rested upon naturalistic assumptions which made the co-operation of intellect indispensable. With natural laws governing the human constitution on all its planes of being, and rapport between man and these laws requisite for complete eucrasy, the task of mind in discovering and applying these laws obviously becomes vital. It was, of course, necessary for Mann to account for evil in the world. If the moral affections are innate--if we begin life with the pristine equipment for virtue--whence the perversion of natural impulse? Mann answers this question by making us creatures of circumstance--by setting us squarely down in the physical world, whatever our innate powers! For, although convinced of "the supremacy of the moral sentiments,"[11] Mann also contended that "all affections and impulses must be guided by intellect."[12] Motives may be good, but if ignorance prevails there will be misapplication of

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[10] III, 130.

[11] V, 25-29.

[12] V, 29.

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intrinsically virtuous (because natural) impulses. Thus infanticide or parricide among pagan nations was "patriotism, virtue, and a sense of duty, following the false lights of an ignorant or perverted mind."[13] At the same time, Mann, while subscribing to the doctrine of innate moral affections, also accepted Lockean sensationalism;[14] and since he believed that "the ideas excited in the mind by means of the senses constitute at least the main portion of the elements of subsequent reasoning,"[15] he had to conclude that adequate intellectual development requires the right environmental conditions. But if the moral affections depend upon correct reasoning for their proper release and guidance, then they too must depend ultimately upon external environment.[16] Evil, then, as a

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[13] V, 29-32.

[14] II, 23; IV, 78-79.

[15] "If we may use an artisan's comparison," he continues,

> the senses bring a large part of the rough stock or raw material into the mind, afterwards to be worked up by the reason into solid and useful productions. And as no skill of the workman, though it rise to infinite, can make a durable and perfect fabric from worthless substances, so the noblest intellect ever created will produce only erroneous results, if acting upon a store of false perceptions.
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> II, 23 (from the "Prospectus" of the Common-School Journal, I (1838-9).

[16] Thus Mann (V, 25):

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modern sociologist would say, is the product of a bad environment; that is, one which causes men to live in disharmony with the laws of nature. The remedy, of course, is, by suitable alterations in social institutions and in modes of living and working, to put man back in harmony with the laws of nature. In this connection it should be noted that Mann saw the moral and physical planes of existence related in still another way. Not only was the fulfillment of the spirit, in large measure, subject to the effect of physical stimuli operating through the senses upon the intellect, but it was also influenced directly by the state of bodily health. Mann was sure that, "with unsound physical organization, with obtuse senses and unmanageable nerves," even "the energy and purity of an angel's spirit would be crippled and in bondage."[17] And, of course, it is within the power of

[Footnote 16, contd]

> We maintain that domestic and social affections, reason, conscientiousness, and susceptibilities, by which we can be made to venerate and reverence all that is divine and adorable, constitute parts of our being; and, were all our faculties wisely trained and developed, and brought within those influences which are ever ready to act upon them, instead of the great cities of the earth ever being searched in vain to find five righteous men, they might be searched in vain to find many who were not righteous.

[17] V, 64.

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intellect to ascertain the laws of nature here too, and thus to control further the moral state of man.[18]

Hence we see that to Mann the highest of human powers are firmly integrated with nature: 'internally' receiving the impress of nature itself, 'externally' owing their moral effect to harmony with natural laws ascertained and applied by a mind subject to sense-data. In either case science and technology become the keys to human reformation; since, to repeat, the physical, intellectual, and moral welfare of mankind depends upon accord with the laws of nature, and it is only reason aided by the discipline of scientific method, that can disclose and apply those laws which it is virtue to obey, sin to disobey.

When the constitution of man is completely submerged in nature, it becomes completely subject to scientific analysis. Hence it is not surprising that Mann should have been susceptible to the claims of phrenology. It

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[18]Accordingly he reminds the readers of the Common School Journal that

> it is our duty, by industry and frugality, to provide a competency for our physical subsistence, and, by practicing temperance in all things, to obtain an insurance from nature upon continued health and prolonged life; because without these possessions, the duties of a superior grade will either be imperfectly performed or wholly omitted.
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> Quoted in Works, V, 25-26.

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is not certain that he accepted all of these claims,[19] but at least upon one occasion he spoke of "we phrenologists,"[20] and in any case he always accorded Combe and his works the highest praise. He judged Combe "the completest philosopher" he had ever known,[21] delighted in the Boston lectures on phrenology,[22] accompanied the lecturer on a Western tour,[23] and even adopted the jargon of the 'new science.'[24] He prophesied that the Constitution of Man "will work the same change in metaphysical science

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[19]Cf. Dictionary of American Biography, XII, 243:

> Although Mann acquired from Combe a belief in phrenology, undoubtedly the greatest source of Combe's influence over him was the Scotch philosopher's unswerving faith in the unlimited improvability of the human race through education.

But Mary Mann, his biographer, explicitly gives us to understand that Horace Mann had some reservations about phrenology. "He did not come to all Mr. Combe's conclusions," she writes,

> nor was he bound by his limitations; but he enjoyed that philosophy which recognized the adaptation of every faculty to its appropriate object. It simplified for him the whole theory of mental phenomena.
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> I, 139. Cf. also I, 47.

[20]I, 14.

[21]I, 116.

[22]I, 105-107.

[23]I, 125-131.

[24]I, 138-139.

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that Lord Bacon wrought in natural,"[25] and when asked by Combe for an expression of opinion about the Moral Philosophy, wrote:

> That it should be equal to the 'Constitution of Man' was impossible. There can be but one discovery of the circulation of the blood, there can be but one author of the 'Constitution of Man.' He or others may apply its principles to facts, and to new combinations of facts; but the great discoverer must stand unequalled by himself or by others.[26]

When the two philanthropic gentlemen parted after their Western trip, Mann entered in his "Journal" the opinion that

> Mr. Combe ... seems ... to understand, far better than any other man I ever saw, the principles on which the human race has been formed, and by following which their most sure and rapid advancement would be secured.... In the next century, I have no doubt, he will be looked upon as the greatest man of the present.[27]

Whether or not Mann accepted without qualification the principles of phrenology, the direction of his thought is unmistakable. There is no question, for example, of his belief in the power of science to promote moral as well as (and by means of) physical health. His entire "Sixth Report, for 1842" was a plea for the

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[25] I, 105.

[26] I, 137.

[27] I, 131-132.

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teaching of physiology in the schools, because it promised health and virtue.[28] He also urged physical education for the same reason.[29] Furthermore, he saw mankind continually increasing its dominion over the environmental conditions capable of seriously affecting the human constitution. For he not only saw science extending man's comprehension of the natural laws exerting their influence through environment, but also augmenting his power to transform that environment in accord with natural law. The Promethean theme is an integral part of Mann's ideology. The "body of human science" he considered the one great element in the superiority of civilized man.[30] In his "Report for 1841" he invoked the support of Lord Brougham and Dr. Potter for the thesis that knowledge is power and power, progress. The advance of science and technology, he argues, presupposes and promotes intellectual elevation; so, by diffusing useful knowledge, we will be aiding "greatly to ameliorate the condition of the mass of mankind."[31]

To Mann, in fact, the progress of humanity is assured. It was a law of the universe that he should pro-

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[28] III, 129-229.

[29] V, 46-49.

[30] II, 25.

[31] III, 113-128.

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gress physically and spiritually--and principally by means of the knowledge which is power. The "richest endowment" of "the human soul," he announced in the Common School Journal (1841), is "its law of expansion and progress." And he adds:

> How wonderfully has this attribute of expansion and development in the progress of the useful arts, which have risen from the rudest contrivances of a barbarous age, to those combinations of power and skill, by which a single individual can now add more to the comforts and conveniences of life, than could once be accomplished by the united labors of a nation! How many sciences, ministering to the dignity and enjoyment of the species, have, in later times, been evolved, of all the elements of which, the ancients for so many centuries held unconscious possession![32]

This progress, of course, brought responsibilities. It was being realized in and furthered by the democratization of life as well as the secularization of learning. Hence the importance, for Mann, of popular education: "If the multitude, who have the power, are not fitted to exercise it, society will be like the herding together of wolves."[33] Accordingly, education was "the cause, of all others" that "roused into action all his powers";[34] and he

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[32]Reprinted, V, 33-34.

[33]II, 7-14 ("Prospectus of the Common-School Journal"): "That intelligence and virtue are the only support and stability of free institutions, was a truism a long time ago." (p. 7)

[34]I, 59.

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could proclaim the Common School "the greatest discovery ever made by man."[35] His hope for the brave new world rested upon education--and an education informed with the concepts I have already described. Conveniently enabling us to see at once its significant features, Mann framed his idea of education in a single definition:

> I hardly need to say, that, by the word Education, I mean much more than an ability to read, write, and keep common accounts. I comprehend, under the noble word, such a training of the body as shall build it up with robustness and vigor,--at once protecting it from disease, and enabling it to act, formatively, upon the crude substances of Nature,--to turn a wilderness into cultivated fields, forests into ships, or quarries and clay-pots into villages and cities. I mean, also, to include such a cultivation of the intellect as shall enable it to discover those permanent and mighty laws which pervade all parts of the created universe, whether material or spiritual. This is necessary, because, if we act in obedience to these laws, all the resistless forces of Nature become our auxiliaries, and cheer us on to certain prosperity and triumph; but if we act in contravention or defiance of these laws, then Nature resists, thwarts, baffles us; and, in the end, it is just as certain that she will overwhelm us with ruin, as it is that God is stronger than man. And, finally, by the term Education, I mean such a culture of our moral affections and religious susceptibilities, as, in the course of Nature and Providence, shall lead to a subjection or conformity of all our appetites, propensities, and sentiments to the will of Heaven.[36]

The naturalistic and utilitarian character of Mann's

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[35] V, 37.

[36] II, 143-144.

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idea of education is evident from the definition alone, but this becomes clearer, more emphatic, upon closer examination of his pedagogical views. In the first place, he insisted that educational aims and methods be based upon scientific study of the constitution of man - which put the soul at once under the dominion of science. It was his desire to see teachers equipped with 'scientific' principles of pedagogy, that made him a leader in the Normal School movement.[37] He held it "indispensable" that "every teacher ... know by what means,--by virtue of what natural laws,--the human powers and faculties are strengthened or enfeebled;" for

> there is a principle running through every mental operation,--without a knowledge of which, without a knowledge how to apply which, the life of the most faithful teacher will be only a succession of well-intentioned errors.[38]

We must, then, teach 'scientifically' if we are to teach effectively. For 'true' knowledge of the constitution of man and a sound pedagogy grounded therein, Mann would have all teachers sit at the feet of Locke, the Scotch philosophers, Pestalozzi, Maria Edgeworth and George Combe. When one young aspirant to a teaching

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[37] II, 46-47, 103-120, 419-420.

[38] II, 120.

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career inquired how he might best prepare for the profession, Mann gave him a reading list headed by Combe's Constitution.[39] Mann's "Journal" attests to his agreement with Maria Edgeworth's pedagogical views: "Have been reading Miss Edgeworth's excellent work on 'practical Education,'" he once wrote.

> It is full of instruction. I have been delighted to find how often the views therein expressed had been written out on my own thinking. Had I ever read the book before, I should charge myself with unconscious plagiarism.[40]

Pestalozzi, whom he called the "wisest of schoolmasters," he several times expounded for American educators.[41] Every teacher cannot be a Pestalozzi, he conceded; but "shall they not, as far as possible, imitate him, and, by pursuing similar means, approximate to similar results?"[42]

Like Pestalozzi, Edgeworth, and Rousseau before them, Mann held the fundamental principle of education

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[39] I, 112-113.

[40] I, 102.

[41] IV, 81. The basic principles of Pestalozzi are explained by Mann in his "Report for 1845," pp. 81-82, 94-100; also V, 179. Pestalozzian pedagogy enters the discussion of European education comprising most of the "Report for 1843" (III, 303-342).

[42] IV, 81-82.

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to be 'follow Nature'--teach "in the clear light of Nature."[43] Instruction was to be adapted to the constitution of the child, empirically ascertained. "There is," he iterates, "a natural order and progression in the development of the faculties"; and the instructor must not cultivate them "in the reverse order of their natural development."[44] What, then, does nature decree as the proper order? Mann's is the Baconian answer, of course: "A proper intellectual education begins with a cultivation of the senses."[45] For nature has so disposed the young mind that it may readily learn what is essential to its welfare; it has been endowed with strong curiosity about the external world and is gratified in exercising that curiosity.[46] The teacher should adapt instruction

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[43] IV, 79-80.

[44] II, 166.

[45] II, 22. Significantly, we are told (II, 23-25) that "the next office of the intellect is to observe the relations which exist between object, and how they may be made subservient to human welfare." And then: "But the highest function of the intellect is that of discovering the Laws which the Creator has impressed upon every work of his hands." The human mind is thus directed all the way towards scientific discipline.

[46] II, 48-49:

> Acquirement and pleasure should go hand in hand. ... Nature has implanted a feeling of curiosity in the breast of every child, as if to make herself certain of his activity and progress.

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to learn.[47] Accordingly, he will begin with 'things,' not 'words';[48] the familiar, not the remote--will teach all subjects inductively.[49] "Thus the pupil founds his knowledge of unseen things upon the distinct notions of eyesight, in regard to familiar objects."[50]

> What more natural than that a kind teacher should attempt to gain the attention and win the good-will of an active, eager-minded boy just entering his school, by speaking to him about the domestic animals which he plays with, or tends at home.... Yet, without any interruption or overleaping of natural boundaries, this simple lesson may be expanded into knowledge of all quadrupeds, their characteristics and habits of life.... Few children go to school who have not seen a fish,--at least a minnow in a pool. Begin with this, and Nature opposes no barrier until the wonders of the deep are exhausted.[51]

In short, it is ordained by nature that the study of nature become the keystone of education.

Technological education shared, for Mann, this virtue of the 'natural.' Obviously the pedagogical corollary of Lockean sensationalism implied the doctrine ex-

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[47] II, 48-66; III, 303-342, 355-356 (in fact, passim).

[48] Cf. "Words, Words, Words" (originally in the Common-School Journal, I (1838-39), 18-21), V, 177-184. Cf. also, II, 69-72.

[49] IV, 95-102.

[50] II, 67-68.

[51] III, 338.

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pressed commonly in the phrase 'learn by doing.' Not utility alone but mental invigoration was its promise. "The things, the relations, of art, of science, of business," Mann argued

> are to the mind of a child, what the nutriment of food is to his body; and the mind will be enervated, if fed on the names of things, as much as the body would be emaciated, if fed upon the names of food.[52]

Mann also followed Pestalozzi in strongly recommending the subject of drawing as of great value in training the power of observation and in developing the intellect generally.[53]

But such studies had the added value of answering to the practical needs of society.[54] In any case, Mann argued,

> if one wished to prepare a boy to work upon a farm, or to be a salesman in a store, would he shut him up in a closet, giving him a list of the names of all the farming utensils and seeds and products; or a list of all the commodities in a trader's invoice, and when he had learned these, send him to his place of destination as one acquainted with the objects, the materials, with which he is to be occupied?[55]

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[52]V, 180.

[53]III, 328-330.

[54]The "Report for 1841" is devoted to expounding the relation of progress to the useful arts: III, 92-128.

[55]V, 73.

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However important to Mann the intellectual discipline and practical benefits of education, yet he held (even as would a humanist educator) that the moral culture of the individual should be the supreme concern of education--"the finishing work, the highest and noblest office of education."[56] But this meant to the Baconian educator added reason for advocating still more science and technology in the curriculum. The argument has already been made plain: There were the lessons of natural religion and the spiritual inspiration of natural phenomena: And even technology, it appears, could help nature to stimulate the moral sentiments.[57] "If a model were given," Mann suggests,

> every ingenious boy, with a few broken window panes and a pocket-knife, could make a prism. With this, the rainbow, the changing colors of the dew-drop, the gorgeous light of the sunset sky, could be explained; and thus might the minds of children be early imbued with a love of pure and beautiful things, and led upward towards the angel, instead of downward towards

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[56] V, 73.

[57] 'Things' have a curious way of promoting morality, wherever one looks into Mann. Note, for example:

> Never was a severer satire uttered against human reason, than that of Mirabeau, when he said, 'words are things.' That single phrase explains the whole French Revolution. Such a revolution never could have occurred amongst a people who spoke things, instead of words.
> II, 71 (Vid. also II, 60.)

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> the brute, from this middle ground of humanity. Imbue the young mind with these sacred influences, and they will forever constitute a part of its moral being; they will abide with it, and tend to uphold and purify it, wherever it may be cast by fortune in this tumultous arena of life. A spirit so softened and penetrated, will be
> 'Like the vase in which roses have once
> been distilled;
> You may break, you may ruin the vase,
> if you will,
> But the scent of the roses will hang
> round it still.'[58]

One feels like saying: 'Catch a scientific naturalist and you catch a Wordsworthian temperament!'[59]

Moreover there was the fundamental relationship between science, technology, and morality, deriving from Mann's Baconian concept of natural law. On this basis science becomes indispensable to morality. Assuredly, then, it is the vital task of education to make men aware of the laws of nature with which they must live in harmony or else fall prey to immorality and wretchedness. These laws, further, make man's physical, intellectual, and moral states interdependent.[60] From this it follows

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[58] II, 60.

[59] Note also, IV, 77:

> Nor is utility the only purpose of those beautiful relations which exist between ourselves and the external world. The goodness of God is as pervading as his power, and hence he has everywhere intermingled pleasure with advantage. Golden threads are thickly interspersed in every web which nature has woven.

[60] Iv, 423-427. Physiology and physical education

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that, for the sake of moral well-being, education must communicate and encourage obedience to the laws governing the physical, mental and moral constitution of man,[61] and must itself proceed in such manner as not to violate those laws; and finally that it must provide technological training to enable man more effectively to apply his knowledge of them.[62] A wise Providence had so arranged

[Footnote 60, contd]

should be accorded the "first rank in our schools," Mann argued. III, 131. Cf. also II, 21-22; III, 132, 138-144; V, 46-49.

[61] IV, 58-59:

> There are two forces, - man, and the agencies that encompass and pervade him. These act and react upon each other. In a state of human perfectibility, they would perfectly coincide and harmonize. A state of human imperfection is nothing more than man struggling, either ignorantly or wilfully, against the conditions of his being, - against the laws of the system in which he is placed....
>
> To know these laws, and to be animated with a disposition voluntarily and lovingly to obey them, is to be educated. Not to know them, or not voluntarily and lovingly to observe them, is to be uneducated, or miseducated.

From nature too he drew confirmation of his Puritan attitude towards intemperance. Cf. II, 114. "Sin is a transgression of the law," Mann proclaims. "Report for 1842," III, 129-229.

[62] Meaning that the inductive method in teaching and a heart-to-heart relationship between teacher and pupil (releasing properly according to their laws, the moral sentiments, V, 27-32) are important, but so too, is proper ventilation in the schoolroom.

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matters that the content of education most suitable from a pedagogical standpoint was also the instrument directly of social progress. There were thus at least two fundamental and interrelated reasons for urging a scientific and technological education. A naturalistic pedagogy was to produce superior, more effective men and women; and it was at the same time to give these modern Prometheans the tools for advancing civilization according to the dictates of their superior intellectual and moral selves. The study and application of nature's laws thus meant control of human development both directly and through power over the world external to man. Science and technology meant a power to create an environment answering more to the needs of humanity--a power which gave promise of a brave new world in which man would no longer be helpless before the forces of nature, but capable of controlling his environment for the fullest possible development of his personality.[63]

This was the Baconian faith which Mann shared, and to the propagation of which he contributed. His zeal on behalf of utilitarian education was complementary to his principle that the moral is the ultimate goal of education. He saw the world ordained to progress, and he

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[63]Cf. "Report for 1841," III, 92-128.

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saw America in the vanguard of the forward movement. He saw this progress manifested in and motivated by an increasing democratization of life and a diffusion of useful knowledge. Education, if it was to further this advance, had to be universal, socially oriented and daedalian. It had to be universal and directed towards immediate social needs, because the preservation of free government requires an enlightened citizenry, capable of understanding its duties and privileges. It had to be daedalian and universal because the common man needs preparation for the practical tasks of life, and moreover because science and technology themselves contribute to the intellectual improvement and therewith to the social elevation and political power of the common man. Finally, it had to be daedalian because, by augmenting man's power to make nature produce for his welfare, it advances civilization still further.[64]

Thus Horace Mann envisioned a world of enlightened workers advancing civilization by their collective scientific and technological effort. Conversely he was hostile to aristocracy[65] and he derogated 'mere literary' cul-

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[64] Ibid.; also II, 143-188 ("Necessity of Education in a Republican Government"); IV, 341-403.

[65] Thus he could censure the Prussian system of education which, though properly directed (in the Realschule)

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ture.[66] Although he had been a tutor in ancient literature for a short time at Brown, Mann was none the less disinclined to favor the study of 'mere words' by ancients who had been 'ignorant of the natural sciences.'[67] The brave new world would belong to the common man. It would be a world in which, enlightened by scientific and technological education, each would contribute to the power and--as taught by that oracle, the great Adam Smith--the prosperity of all, and thus make for more enlightenment, more freedom, more prosperity, ad infinitum. "We see," he wrote to Combe,

[Footnote 65, contd]

towards science and technology, nevertheless did not elevate Prussian society, because the Prussian government did not know the democratic way of providing opportunity for the common man to apply his useful knowledge. III, 374-378. Cf. also III, 110.

[66] In his "Report for 1839," a plea for district library facilities, Mann is quite stern against novel reading. He admits the grace and polish derived from literary culture, but insists that "light reading makes light minds," that novel reading is no preparation for life. Hence he is anxious to see libraries making available the really valuable sort of books; scientific and technical, for example, which require a higher order of intellectual effort than do 'fictions.' "Practical wisdom and benevolence above all," he enjoins here as everywhere; those are the prime needs of society. III, 11-52.

[67] II, 248-249; III, 369-370. Arguing the value of physiology as a course of study, Mann censures the school's preoccupation with Latin, Greek and rhetoric to the neglect of "life knowledge." III, 168. Cf. also the Common School Journal, II (1840), 188.

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that there will be a new earth, at least, if not a new heaven, when your philosophical and moral doctrines prevail. It has been a part of my religion for many years that the earth is not to remain in its present condition forever.[68]

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[68] I, 111. Mann's naturalistic pedagogy was attacked by a group of Boston schoolmasters who insisted upon the need of rods to correct "the sensuality of our nature" and who challenged the idea of the power of science. Their published animadversions included: Remarks on the Seventh Annual Report of the Hon. Horace Mann, Secretary of Massachusetts Board of Education, Boston, 1844; [Leonard Withington], Penitential Tears, or a Cry from the Dust, by 'the Thirty-One,' Prostrated and Pulverized by the Hand of Horace Mann, Boston, 1845; Rejoinder to the 'Reply' of the Hon. Horace Mann, Secretary of the Massachusetts Board of Education, to the 'Remarks' of the Association of Boston Masters upon His Seventh Annual Report, Boston, 1845.

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CHAPTER III

Timothy Flint, Scientific and Sentimental Naturalist[1]

The merging of scientific and sentimental naturalism is vividly represented in the frontier missionary and author, Timothy Flint, whose writings are largely a miscellany of geological and phrenological observations, notes on Indian antiquities and affirmations of the beneficent influence of natural surroundings. His Lectures upon Natural History,[2] published in 1833, is itself addressed to the reader's heart as well as his intellect.[3]

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[1]Among others who likewise combined scientific and sentimental naturalism in their general outlook, might be mentioned G. W. Burnap, Charles Follen, John Pierpont. See Part Two, Ch. II. An excellent example of the scientist and sentimentalist is James Gates Percival. Cf. Poetical Works, I, 381-402; J. H. Ward, Life and Letters of Percival, pp. 548-552, 560-562.

[2]A composite from various sources, chiefly Aime Martin's Lettres à Sophie, but liberally supplied with Flint's own observations. Cf. Preface, p. v.

[3]The title page itself bears these lines from Virgil and Akenside respectively: "Felix qui rerum potuit cognoscere causas" and

"The man
Whom nature's works can charm, with God himself
Holds converse."

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Now Flint, being a Baconian, was an optimist. He believed in progress, and he believed that science was the mother of progress. To him it was "the most cheering and conspicuous feature in God's universe" that, "amidst all its mutability and decay and apparent disorder," there is "a progressive advancement in the scale of melioration."[4] And "the best proof, that the condition of human nature is advancing" was, for him, an achievement made possible by science: the lengthening of human life. Here, in an accomplishment for which he credits both the temperance movement and vaccination, Flint finds "a standing scale of measurement by which the other improvements of the human condition may be calculated."[5] "The single fact of the prolongation of human life," he announces,

> ... is worth more than whole volumes of declamation, to prove the progress of true knowledge, a more enlightened reason, and a purer morality.[6]

It was his opinion, moreover, that "when the laws of

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[4] Op. cit., p. 405. Flint conceives the progressive principle in nature explicitly in the form of "the great chain of being." God's plan of progress, he argues, is revealed in the formation of the earth from a fiery mass to a place habitable by man. Ibid., pp. 405-407.

[5] Ibid., pp. 407-408.

[6] Ibid., p. 408.

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nature, and the physiology of our species" become the basis of education and moral living, we may overcome many persistent impediments to progress.[7] However, the constitution of man must first be scientifically ascertained. He would relegate "with the lumber of the schoolmen to the moles and the bats" all 'mere notions' of a "blanca charta" or of innate ideas; for he stood on the evidence offered by phrenology: "the labelling with which it has pleased the Creator to mark all his human samples."[8]

In the first of his Lectures upon Natural History Flint distinguishes between the physical, organic and moral laws of the universe, but proceeds to make them alike subject to scientific investigation. He anticipates the day when metaphysics - "the noblest of all sciences," although now "the derision of practical men" -

> shall be directed by the lights of the inductive philosophy, and shall be solely occupied in analyzing, classing and recording mental phenomena, and generalizing the systems of facts, so obtained, for the benefit and advancement of all those most important collateral studies, that

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[7] "The Influence of Education On the Formation of Character," Knickerbocker Magazine, II (1833), 402; "Phrenology," ibid., pp. 109-110.

[8] "Influence of Education" and "Phrenology," ibid., pp. 103-110, 401-409. Phrenological analysis became a habit of mind with Flint. Thus he can lapse into a phrenological estimate of the head of Daniel Boone or Chief Black Hawk in the midst of a general description of the men. Indian Wars of the West (Cincinnati, 1833), pp. 222, 238.

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depend upon our understanding the laws of mind...[9] Law for man and law for thing are not differentiated. He declares, in fact, that "the organic and moral laws, to the extent of our sphere of observation, are equally uniform, unchanging, and identical."[10] It is the duty of man to comprehend them and, by submitting to their sway, achieve a moral and happy existence. "All our suffering here and forever," he writes,

> must result from their infringement; and our happiness, from knowing and obeying them. To study them so as to understand them to the extent of our power, in order to adore the infinite wisdom and goodness of the lawgiver, and with undeviating uniformity to obey them, is true philosophy, and our best wisdom. Health, sound reason, the highest perfection of our intellectual and moral nature, and our present and eternal well-being, are rewards of this knowledge and obedience.[11]

As indicated by this quotation, a kind of holy inspiration is seen by Flint as one factor responsible for the moral efficacy of a scientific study of natural phenomena. For human betterment, the mind needs the heart in alliance with nature. As a sentimental naturalist, an admirer of Chateaubriand,[12] Flint conceived of a pure and

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[9] Western Monthly Review, II (1829), 576. Note also Flint's espousal of phrenology.

[10] Pp. 13-14.

[11] Lectures upon Natural History, p. 14.

[12] Ibid., p. 388. Cf. also DAB, VI, 474-475.

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edifying influence emanating from woods and hills and streams, an influence directed towards the sensibilities of men and supplementing the purely intellectual guidance of science.[13] He felt in some vague way that contact with nature is contact, through feeling, with God. Even a suggestion of pantheism could creep into his writing. At one point he explains that by the term nature he "would be understood to mean Providence or God."

> In the heavens and the earth, in man that thinks, and the insect that creeps, I have found every thing labelled with the single, grand, all comprehending term - God.[14]

The mere "opening of a view" of "imposing and inspiriting character" could exalt his "soul to 'solemn thought and heavenly musing.'"[15]

But this sympathetic union by which nature allegedly exerts her moral tendency was not always associated by Flint with natural religion. There was also the power of nature to evoke 'refined sentiment,' and above all, the lofty passion of the poet. Even "the sounds of the wind" have "their influence upon the spirit of man" - have,

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[13] In his writings generally he turns from sentiment to science and back to sentiment, indiscriminately.

[14] *Lectures,* Preface, p. viii.

[15] *Recollections of the Last Ten Years,* ed. C. Hartley Grattan (New York, 1932), p. 29.

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indeed, the power to inspire the poet's exalted strain. "The poetry of the ancients," Flint explains, "is beautiful and endearing, because they had ears exquisitely attuned" to nature's voice. The great poet is the very child of nature, yielding "himself to [her] grand spectacles, [her] inspiring sounds." There was Ossian, the "bard of melancholy," whose song was inspired by "the voices of nature" - and there was the great Schiller:

> In the midst of a storm, he was often seen to throw himself into a boat, and abandon himself to the dashing waves of the Elbe. He felt his thoughts rise with the increasing fury of the storm; and his conceptions swelled with the roar of the tempest. He saluted these aspects of nature, in her terrors, with cries of gladness; and an inexpressible joy pervaded his mind.[16]

Thus the pathetic fallacy clearly emerges in Flint's thought as part of his naturalism - as "an apparent absorbtion of the soul in nature."[17] The highest expressions of the spirit are ascribed to communion with nature; the divine poetic fervor is romantically conceived as a manifestation of natural force. It would follow that the greater, the freer, the release of natural impulse, the higher the plane of literary creation. The springs of

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[16] Lectures, pp. 91-94. These observations are immediately followed by a lecture entitled, "Weight of the Atmosphere"!

[17] Cf. P. E. More, Drift of Romanticism, p. 261.

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of emotion were in nature and great literature flowed therefrom. By the same principle, Flint explained the eloquence he encountered among Kentucky pioneers:

> Enthusiasm and strong excitement naturally inspire eloquence, and these people become eloquent in relating their early remembrances of the beauty of this country.[18]

Flint's primitivism did not, however, extend to exaltation of savage life or wild freedom.[19] He was genteel as well as pious.[20] But in addition to his literary primitivism, he did have an agrarian bias, and with that an aversion to mere mechanical progress and to what he considered the utilitarian preoccupation of the expanding nation. In his opinion, the valley of the Mississippi owed its felicity to the fact that "almost the entire population of the valley are cultivators of the soil."

> The inhabitants of crowded towns and villages, the numerous artizans and laborers in manufactories, can neither be, as a mass, so healthy, so virtuous or happy, as free cultivators of the soil. The man whose daily range of prospect is dusty streets, or smoky and dead brick walls, and whose views become limited by habit to the enclosure of these walls; who depends for his subsistence on the daily supplies of the market, and whose motives to action are elicited by constant and hourly

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[18] Recollections, p. 66.

[19] For his explicit opinion that the "social" is superior to the "savage condition," see Lectures, pp. 315-317.

[20] Cf. Recollections, passim.

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> struggle and competition with his fellows, will have the advantage in some points over the secluded tenant of a cabin or a farm house. But still, taking everything into the calculation, we would choose to be the owner of a half section of land, and daily contemplate nature, as we tilled the soil, aided in that primitive and noble occupation by our own vigorous children.[21]

In a mood reminiscent of Wordsworth, he can say of himself:

> With the fondness of one of their own children, I have loved the wild woods, the forest-skirted streams, the snow-clad mountains with their secluded dells, the plains and meadows... I ranged the haunts in my vernal day with untiring footsteps, satisfied to see, feel, and enjoy them without investigating final causes, or the object of the luxuriance and beauty before me. But as I find myself in 'the sear and yellow leaf' of autumn,... I have reperused the open volume of nature, page by page, searching with the elder poets, the sweet Mantuan, and the sweeter psalmist of Israel, with Christian philosophers, and all true lovers of nature, for the harmonies of this beautiful universe; for traces of the finger of God; for proofs, that divine love and wisdom are equally discernible in the great and the minute of creation.

And he finds the same message communicated also by the scientist:

> I have returned to contemplate nature with the physiologist, like another Columbus, discovering a new world with the solar microscope. He shows me oceans with their leviathans, forests with their winged inhabitants, empires and kingdoms with their numberless dwellers, where the naked eye sees but a drop of water, a little

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[21] Indian Wars, p. 10. "Agriculture is the foster-child of freedom and security," he wrote. Lectures, p. 318. Cf. also Recollections, pp. 369-370. Evidently Flint did not consider his faith in science and progress to be inconsistent with either his agrarianism or his suspicion of the trend of technology.

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mouldiness, or the blue down of a plum. The truth radiates from these new realms of nature, that creative love is also there.[22]

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[22] *Lectures*, Preface, pp. viii-ix.

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CHAPTER IV

Bronson Alcott, Naturalizer of the Spirit[1]

It has been demonstrated in the preceding pages that the Baconian mind is dominated by a pragmatic attitude, tending to association with the belief that scientifically ascertained operations of natural phenomena constitute ultimate truth. But it has also been indicated that the Baconian mind could entertain intuitionism along with faith in reason guided by scientific method. For when the Baconian had once merged spirit and nature, thus placing the soul itself within the domain of scientific investigation, it was possible for him to predicate a direct, inner relationship between the higher powers of man and natural phenomena. He would be particularly liable to do this if he were a Baconian of 'soft' or romantic[2] temperament, and hence more or less distrust-

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[1]Among other 'naturalizers of the spirit,' with more or less of a transcendentalist tinge, may be mentioned George Ripley and Sampson Reed (Emerson's "divine apothecary"). Cf. Ripley's "The Latest Form of Infidelity" Examined, Boston, 1839; Discourses on the Philosophy of Religion Addressed to Doubters who Wish to Believe (Boston, 1910), pp. 9-11, 40-62, 89-90.

[2]Using the term precisely as defined by Paul Elmer More in Drift of Romanticism, Preface, pp. xii-xiii.

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ful of reason and dissatisfied with mere insensible, cold, laboratory data. Persisting nevertheless in the belief that the soul and hence morality is integrated with nature, he had only to postulate the intuitive, with its connotations of rich emotional and mystical experience, as another avenue to the same Baconian realm of truth. It is true that this meant binding the 'mere flux of things' to the immutable One, or 'spirit'; but it also meant placing them both in nature, identifying the laws of the many with the laws of the One, and proclaiming the highest morality to be the freest and fullest expression of the natural. The difference between "the metaphysic of the many" and "the metaphysic of the one"[3] is, with respect to man's fundamental relation to the cosmos, only the difference between being dissolved in natural phenomena and being dissolved in their principles. Nature is the norm in either case.

As has been shown (for example, in Pestalozzi) it was possible, even convenient, for the Baconian of 'soft temperament,' with his lurking distrust of rationalism, to combine the metaphysic of the one and the many. But it was also possible for the spirit to be naturalized under the semblance of idealism, with physical science

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[3]Ibid., p. 268.

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itself conceived merely as an inferior, circumscribed mode of achieving the truth - which is what we find in Bronson Alcott.

Admittedly, Bronson Alcott was representative of no one but Bronson Alcott. However, that in itself significantly relates the man to Baconianism, originality - even eccentricity - being a token of naturalism. "Biography," wrote Alcott, "is the only true historical record of human nature."[4] Individualism - be it the individualism of Manchesterian economics or of progressive education -

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[4]The Journals of Bronson Alcott, selected and edited by Odell Shepard (Boston, 1938), p. 50. New England transcendentalism had very strong anti-authoritarian proclivities. The individual was expected to attain truth through immediate personal experience - by direct communion with its source in nature. Thus Alcott in his Journals (1836), pp.6-7:

> It is not from books entirely that instruction is to be drawn. They should only be subservient to our main purpose. ... When doubts and uncertainties arise, they may sometimes explain the difficulty and point to the truth. Frequently, however, they lead us astray. They are imperfect. Adherence to them has been the cause, and still continues to be, of perpetuating error among men, and that to an alarming extent. Ideas, when vended in a book, carry with them a kind of dignity and certainty which awe many into implicit belief. They often impose the most irrational and absurd conclusions on the fearful understanding. ... To dare to think, to think for oneself, is denominated pride and arrogance. And millions of human minds are in this state of slavery and tyranny.
>
> How shall they escape?
>
> Rebel! Think for themselves!

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is justified by appeal to the principle that the summum bonum is the unconstrained operation of natural law. Amid the confusion of ideas entertained by the mind of Alcott that fundamental concept is unmistakably evident. He may deem himself a disciple of Plato; he may talk of the "invisible, spiritual Creator" and of the "Divine Spirit"; he may even speak with some scorn of "the gloss of exterior matter"[5] - but he nevertheless binds the spirit to nature and places it under the governance of natural law. And the soul of man can enjoy health only when its liaison with nature remains undisturbed. Alcott merely drew fragments of Platonism into the orbit of his naturalism. It should be noted, further, that besides Plato, the authors whom he alleged 'gave his mind great impetus' are Combe and Pestalozzi.[6] Moreover, his thought was nourished by a host of scientific, pseudo-scientific and romantic writers, including Bacon, Herschel, Godwin, Owen, Shelley, Wordsworth, Carlyle and especially Coleridge.[7] Godwin's Political Justice he

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[5]Ibid., pp. 29, 36, 39-40, 65.

[6]Dorothy McCuskey, Bronson Alcott, Teacher (New York, 1940), p. 68.

[7]On Alcott's reading, see Journals, pp. 3-4, 18, 20, 27, 31-32, 34, 36-39. The relation between Alcott's educational views and German absolute idealism, with its doctrine of innate ideas, is shown by G. E. Haefner,

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read "with great enthusiasm,"[8] and he confessed that it was the reading of Coleridge that "gave my mind a turn toward the spiritual."[9]

Alcott was temperamentally antagonistic towards the dissecting, probing, analyzing scientist. His heart needed a warmer affirmation of nature's truth. He wanted beauty, movement, affection - an emotional, not a rational, unity. Before having read Coleridge, he observes, "I was ... a disciple of Experience, trying to bring my theories within the Baconian method of induction"; but even then, he adds, "my heart was ... lingering around the theories of Plato without being conscious of it."[10] He runs his eye over the pages of Montague's edition of Bacon and remarks:

> Why it is I cannot tell, yet I do distrust Bacon. His method is taking, his genius commanding, yet neither gains my full faith. There seems to be something wanting. He reminds me of magnificent frameworks, but there is wanting the life to animate, quicken, and illume. He never touches the heart. ... I should call him a splen-

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[Footnote 7, contd]

A Critical Estimate of the Educational Theories and Practices of A. Bronson Alcott. Submitted in partial fulfillment of the requirements for the degree of doctor of philosophy in the faculty of philosophy, Columbia University, New York, 1937.

[8] Journals, p. 18.

[9] Ibid., pp. 66-67.

[10] Ibid., p. 66.

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did topographer of knowledge, scarce a philosopher. He methodizes life and spirit all away.[11]

But this does not mean that he rejects the naturalism of the Baconian, or that he seeks truth on a supernatural plane. It is not that he wishes to disregard what he himself terms "the Soul's cast-off wardrobe,"[12] but that, sentimentally, he prefers to allow his imagination and feelings unconstrainedly to play over natural phenomena, to savor what is in reality his own emotional experience, instead of rigorously confining his mind to the discipline of the exact sciences. His argument with the scientific naturalist is that the latter stops with matter and refuses to employ his imaginative powers to unify the many and the one in a 'higher monism.' The scientist "murders to dissect" - looks upon nature with the unimaginative eye and takes for granted that what he sees is the whole truth. Alcott, however, rather than opposing spirit to matter, the soul to nature, presents a "merging together of the animate and the inanimate" in an alternative naturalism.[13] "Nature," he declares, "concretes Soul."[14] Debating with himself the possible value

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[11] Ibid., p. 71.

[12] Ibid., p. 121.

[13] P. E. More, The Demon of the Absolute (Princeton University Press, 1928), p. 47.

[14] Journals, p. 100.

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of attending the lectures of physiologists, he concluded that at least "nature and God would be there in spite of them," even if "God defunct - his corpse merely."[15] Still, at another time, stimulated by Sylvester Graham's physiologico-moral lectures,[16] he expresses a "desire to apprehend the laws" of natural phenomena, particularly those of physiology. Whereupon he proceeds to interpret Jesus as a kind of divine physiologist, whose power proceeds from complete understanding of natural laws:

> I imagine that it will be possible, yea, certain, that the miracles, so called, wrought out by [Jesus'] faith in the spiritual and apprehension of the material, shall be made as common facts, the necessary and natural results of spiritual laws. The study of organs and functions will, I apprehend, become but another view of the Spirit's activity in body. Physiology is none other than the study of Spirit incarnate. We must wed the science of physiology and psychology, and from these shall spring the Divine Idea which, originally one in the mind of God, He saw fit to separate and spread throughout his twofold creation.[17]

Thus the laws of matter became identified with the Idea which was in the beginning. The relation of natural laws

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[15] Ibid., pp. 123-124.

[16] Vid. ante, pp. 197-200.

[17] Journals, pp. 76-77. Thus the spiritual monist would offer power also over nature through comprehension of her laws. These laws being the spirit's own mode of operation, we have only to seek them out and submit to their operation. Paradoxically, it is a sort of power that is promised through passivity! Energy is not self-willed, according to the physicist also.

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"to our being" must, he held, be "made the primary objects of observation and thought."[18] And thus, despite his professed aversion to the labors of the physical scientist, he is found declaring: "I need knowledge of physics as means of setting forth the doctrines of the soul."[19] Everywhere in his thought is this same confusion of physical manifestations with spirit.[20] When, for example, he comes upon a reference to Faraday's discoveries "on the relation of Electricity and Magnetism to Light," he is immediately disposed to

> conjecture that the three are states of One Substance, and that this, by whatsoever name it shall be designated, is the immediate Breath of Life, the nexus of Spirit and matter.[21]

But spirit itself is no more than the immanent and informing principle of matter, and conversely the mechan-

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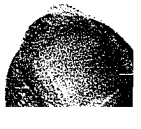
[18] Ibid., p. 49.

[19] Ibid., p. 100.

[20] There is one instance in particular of Alcott's merging of physical and spiritual (a confusion of mere bodily exhilaration with spiritual illumination) which would, I'm sure, challenge the most sympathetic reader. Observing that a bath before supper is "highly restorative" after the day's fatigue, Alcott is prompted to quote:

> And Jesus, when he was baptised, went straightway out of the water, and the Heavens were opened unto him, and he saw the spirit of God descending in a bodily shape like a dove...
>
> Ibid., pp. 176-177.

[21] Ibid., p. 171.



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ism of the universe is ultimately reducible to spiritual activity. Alcott's musings and expostulations are principally affirmations of this basic premise that "matter is a revelation of Mind, the flesh of the Spirit, the world of God" - manifestations of "the Spirit struggling to represent, reveal, shadow forth itself to the sense and reason of man."

> The various kingdoms of matter, with all their array of forms and stages of growth, maturity, decay, are but so many modifications of the spiritual kingdom, whose laws they obey and by whose unseen yet ever-sustaining energy they are kept in their individual condition and attain to their absolute consummation and place.[22]

The "web" of the soul[23] being the soul's fulfillment, can there be anything but unity between them? Can nature possibly offend man or harbor any principle opposed to his highest interests? Can there be any essential conflict of forces in man? No, for evil is now actually a denial of nature, to be explained by the neo-Platonic "doctrine of the 'Lapse.'"[24] Thus it becomes desirable no longer to treat nature as an antagonist

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[22] Ibid., p. 65.

[23] Ibid., p. 121.

[24] Ibid., Introduction, pp. xxiv-xxv. The pain of a toothache is sufficient to start Alcott musing about evil as the infraction of natural law and about duality as an illusion resulting from such infraction. Ibid., pp. 119-120.

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necessary for a self-discipline prerequisite to living on a higher plane; nature no longer provides the means of struggle for mastery by that which is essentially human in man. Power over nature now means power to become submerged in it more effectively. Man is nature, and both essentially pure because spirituality is immanent in both. They are together products of the expansiveness of Soul. Expansion, then, rather than discipline or restraint becomes the law of life; and fulfillment through self-expansion is to be achieved by yielding to the influence of nature within and without - by becoming even as a little child. "By seeking communion and fellowship with Nature," explained Alcott,

> by proving constant to her requirements, such an one endoweth himself with her powers; and taketh all her meanings into himself, setting a value and a name upon her operations and subordinating these to his own spiritual activity. In the mighty Self within him he beholds energies whose ceaseless play shall overcome the kingdoms of Time and Space and establish an eternal dominion, making the universe the instrument of its power.[25]

The cord of sympathy that binds man to nature is likewise revealed, for Alcott, in the beneficent influence of natural surroundings. The closer to nature, the closer to the source of the true, the good and the beautiful. Even Carlyle, though himself an apostle of the Ever-

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[25] Ibid., pp. 49-50.

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lasting Yea, appears to have been amused by Alcott as the earnest advocate of a "return to acorns and the golden age."[26] "I need the influence of Nature," Alcott declared.

> The city does not whet my appetite and faculties. ... I know not how much I lose by this artificial style of living. This morning at Lynn, I walked out before breakfasting and had a vivid experience of the bald ugliness of life in cities when thus contrasted with the fresh grace of existence amidst the scenes of nature. I felt guilty before the fair sun, genial earth, and invigorating air, and confessed to them.[27]

Walking in the country becomes "conducive to the highest ends of culture"; for "amidst the scenes of nature... man finds all his faculties addressed," and "thought at once seizes its images and reflects its face upon the soul."[28] Without acknowledgement Alcott transcribes Wordsworth on the purity of speech, mirroring the purity of the 'natural' heart, which is to be found in rural retreats away from cities where 'nature profanes herself.'[29] As for himself, he felt "under the deepest obligation" to nature:

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[26]Quoted in DAB, I, 140.

[27]Journals, p. 117. As man responds to nature, "efflux of the soul," so nature can also respond to man, according to Alcott. They are capable of acting upon each other, because they share the same spiritual power. Hence: "Let all souls be pure," and the earth's atmosphere "would be sweet and invigorating, void of miasmas and pestilence." Ibid., p. 125.

[28]Ibid., p. 107.

[29]Ibid., p. 95.

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> It kept me pure. It soothed and refined my disposition. It was discipline and culture to me. I dwelt amidst the hills. I looked out upon rural images. I was enshrined in Nature. God spoke to me while I walked the fields. I read not the Gospel of Wisdom from books written by man, but from the page inscribed by the finger of God. The breath of that mountain air, that blue and uncontained horizon, not less than my mother's gentle teachings - not by words, but smiles of kindly approval - were my teachers. Nature was my parent, and from her, in the still communings of my solitudes, I learned divine wisdom, even when a child.[30]

As nature is pure, so is man in his pristine state. It is only when man constrains and warps natural impulses that he becomes what the world terms evil. Accordingly, what period of human life can be more spiritual than infancy? Only, apparently, the period of spermhood: "Mettle [sperm] is the Godhead proceeding into the matrix of Nature to organize Man."[31] "Verily, the Divine Life is alive in the infant's heart," he exclaims. "All the manifestations are of a celestial type. ... They are taken from the Spirit's land." This is "when the spirit is in harmony with itself" and "with the infinite Life that flows through all its functions."[32] Be ye, he counsels, even as a little child, for in him is the highest wisdom.

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[30] Ibid., pp. 133-134.

[31] Ibid., p. 121.

[32] Ibid., p. 67.

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> Except an adult be converted from the outward and his vision be turned inward to the life of the Spirit as it reveals itself in the consciousness of the little child yet in Spirit, he cannot comprehend the true life of humanity.[33]

With the same object that he would commune with trees and hills, he "would commune with God in the hearts of infancy and children."[34] He regretted it deeply that he was prevented from continuing his educational work with children;[35] for it was in the young - their innate purity yet unspoiled - that he placed his hope for reforming the world.[36]

Alcott's educational theory, for which he is perhaps best known, is of course in harmony with his naturalistic Weltanschauung. His views correspond with those of Pestalozzi, whose pedagogical principles and methods he at one time expounded in William Russell's Journal of Education.[37] That Alcott was recognized by his Pestalozzian contemporaries as a leading spirit in advancing their ideas, is indicated by the fact that when Greaves, the

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[33] Ibid., p. 57.

[34] Loc. cit.

[35] Ibid., p. 172.

[36] Ibid., pp. 29-30.

[37] "Pestalozzi's Principles and Methods of Instruction," AJE, IV (1829), 97-107. Will S. Monroe called him "the American Pestalozzi." Op. cit., p. 33.

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English disciple of Pestalozzi, founded his school near London (1837), it was named Alcott House.[38] The underlying bond between sentimental and scientific naturalism is disclosed in Alcott's primary pedagogical axiom that the teacher must base his method of instruction on the nature of the child. Whatever is natural is right for both scientific and romantic naturalist. But the latter, of course, had his aversion to cold analysis and the reduction of mental and emotional life to mechanism. "Wouldst thou be a student of human nature," Alcott had counseled, "place but a feeble faith in the records of the learned,...but go into the kingdom of thine own heart."[39] Alcott would seek out the laws of human development with the vision of a responsive heart - of instinctive sympathies. The instructor "should look to the child to see what is to be done, rather than to his book or his system." But it is the child's heart, not the

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[38]Haefner (op. cit., p. 86) in summarizing Alcott's educational principles is likewise summarizing Pestalozzi's:

> His method, founded on the belief that children are born good, was to be one of drawing out and organizing what developed naturally within the children's minds. Thinking about the material at every step, noticing specific examples and drawing generalizations from the, the inductive method, ... these were to be the essential parts of Alcott's system.

[39]Journals, p. 65.

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teacher's experience, which is the ultimate criterion.

> Let [the teacher] follow out the impulses, the thoughts, the volitions, of the child's mind and heart, in their own principles and rational order of expression, and his training will be what God designed it to be - an aid to prepare the child to aid himself.

Innate goodness being assured, the instructor's duty is solely the "awakening, invigorating, directing, rather than the forcing of the child's faculties upon prescribed and exclusive courses of thought."[40]

In a paper read before the American Institution of Instruction in 1832 "on the nature and means of early education," Alcott expounded his philosophy of education - brought out clearly its two related naturalistic principles: that the learning process should follow the pupil's natural inclinations, and that direct contact with natural phenomena should be the basis of education, books[41] not being excluded completely, but relegated to a subordinate place in teaching. Place the child, Alcott argued, "under the general guidance of the affections" and under natural, hence pure and wholesome influences, and he will respond desirably according to the natural

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[40] Ibid., p. 12.

[41] "On the Nature and Means of Early Education, as Derived from Experience," American Institute of Instruction Lectures, 1832, pp. 136, 140-141.

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laws of his constitution: his innate impulses will be released, and that will mean the release of virtue and truth. Have him study the phenomena of nature and he will not only be engaged in the pursuit for which by the very laws of his constitution he is fitted, but he will also be absorbing the pure influences of nature corresponding to his own spirit and needs. Do this and you bring the child into communion with the life-force indispensable to all great human achievement; for the spirit ever finds its aliment in nature.

> An early experience, fraught with the sympathies and inspiring forms of nature, is the origin and spring of genius. What, indeed, are the artist, the poet, the philosopher, but children whose deep interest in nature, and trust in its teachings, have preserved their beings, in mature life, a faithful mirror of outward analogy. Their minds are pure and undefiled. Truth flows from them as from a sweet and lucid fountain. They behold in the vivid light of nature those deep truths, which, by the perverted eye, are but dimly perceived. They imbibe the sacred truths of nature, which, germinating in their intellectual being, bring forth those fruits, whose analogous verdure, richness and beauty, inspire the beholder with admiration and delight. The young mind kept in this pure sphere during its primal existence, gains that harmony, unity and completeness, which characterize its efforts in after life. Early education, by imparting such influences from analogous arrangements, should conduce directly to such results.[42]

Alcott complains that by prevalent pedagogical

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[42] Ibid., p. 136.

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methods "the analogies of nature and Providence are denied their vivifying influence on the mind"; for the child is taught 'words' instead of 'things.'[43] The Pestalozzian doctrine of natural curiosity and its corollary, the primacy of nature-study, is interpreted by Alcott as spirit calling unto spirit. He protests that while the child's "original tendencies...are urging him forward toward truth" through experience with external objects, he is "primarily referred to the mere symbols of nature, as presented in books, often distorted and arbitrary," as well as "devoid of the freshness and beauty of the original." The child, he argues, instinctively "prefers the original to the copy," "turns with instinctive fondness to the study of objects, and things, and events around him," and dwells "with delight on outward nature"; but he is thwarted by the usual education - "his truest wants are not supplied." "He asks for bread, and is offered a stone." Truth itself is replaced by mere "arbitrary copies of truth," and thus "the juvenile powers are turned from their native direction into false channels."[44] Whereas the very "school-rooms should become museums, imaging forth the variety and beauty of the

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[43] Ibid., p. 140.

[44] Loc. cit.

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material and mental world." If the child's observation is thus "disciplined":

> if his whole mind is placed under the willing guidance of these agencies, he is already in the path which conducts to truth; he has found the key which unlocks its gates. He is able to appreciate truth which exists for him everywhere: it is not confined to the book, nor dispensed solely from the teachings of the school-room. Nature is to him a vast school-room; and he delights to take his primal lessons from the pointing finger of Providence.[45]

And Alcott promised that, were instruction to be reformed in the light of his principles - were "the language of verified experience" to be "fully spoken" and a "genial education" provided the children of men[46] - there would open a new heaven and a new earth. Even as the scientific naturalist could promise progress (although the laws of nature are themselves fixed) through the extension of the knowledge of nature, which is power; so also could the sentimental naturalist (although communion with immutable laws implied a return to simplicity) promise progress towards a brave new world through the inspiration of nature, which is power. "Hitherto," Alcott charged,

> we have looked outward for wisdom; we have not looked inward, and drank [sic] at the waters which spring up into everlasting life. The errors of previous ages of external observation are all

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[45] Ibid., p. 141.

[46] Ibid., p. 162.

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> accumulated in man's discordant and broken experience, without order, sequence, unity, or analogous data; obscuring truth, by the clouds and darkness thus gathered over it.

"But this era," he prophesied, "will pass away." And the day will come when man can achieve full self-expansion in and by nature, and it "will be the day of great things" - a day that will see "the legitimate employment of the human intellect for unsealing the fountains of light and life, to renovate humanity."

> Light will break forth from the supposed desert of the infant mind. The star of observation will guide the wise men to the infant cradle, to study the young child, who is born a teacher to humanity. Man's condition will be adapted to his being: the renovating agency will operate on all his powers. Human nature gratefully imbibing the genial influence, and forgetting past injustice, will rise into life, and light, and purity.[47]

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[47] Ibid., p. 163.

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APPENDIX

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I

The following is only a partial list of laudatory reviews of contributions to science made by Americans:

American Monthly Magazine and Critical Review:
"Cleaveland's Mineralogy, I(1817), 183-187.
"Barton's Podromus," I(1817), 356-359.
"Manual of Botany for the Northern States [Eaton]," II (1817), 426-430.

American Quarterly Review:
"Weights and Measures," II(1827), 533-539.
"The Steam-Engine," (VI(1829), 408-437.
"Wilson, the Ornithologist," VIII(1830), 360-380.
"Ornithological Biography [Audubon]," C(1831) 245-258.
"Renwick's Mechanics," XI(1832), 120-153.
"Dunglison's Physiology," XIII(1833), 375-403.
"Audubon's Ornithology," XVIII(1835), 38-62.
"Agriculture," XXI(1837), 1-17.

Analectic Magazine:
"Mitchell's Ichthyology," V(1815), 521.
"Cleaveland's Mineralogy," IX(1817), 301-314.
"Say's American Entomology," X(1817), 233-237.
"Academy of Natural Sciences of Philadelphia, Journal of," XI (1818), 191-198.
"Barton's and Bigelow's Medical Botany," XI(1818), 1-9.

Knickerbocker or New York Monthly Magazine:
"The Architecture of Birds," I(1833), 130.
"Lectures upon Natural History ... by Timothy Flint," I(1833), 193-194.
"Plain and Practical Treatise on the Epidemic Cholera [Reese]," II(1833), 65-66.
"The Treasury of Knowledge and Library of Reference," II (1833), 68.
"A New Theory of Animal Magnetism by Samuel L. Metcalf," II (1833), 223-226.
"Bayle's Elementary Treatise on Anatomy [Trans. Doane]," IX (1837), 197.
"The Reformation of Medical Science Demanded by Inductive Philosophy [Wm. Channing]," XV (1840), 345-347.

New England Magazine:
"Nuttall, American Ornithology," II(1832), 258-261.

North American Review:
"American Academy's Papers," I(1815), 370-389.
"Pitkin's Statistical View," III (1816), 345-354.
"Cleaveland's Mineralogy," V(1817), 409-429.
"American Medical Botany," VII(1818), 344-368.
"Bigelow's Medical Botany," IX(1819), 23-26; XIII(1821), 100-134.

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"Gorham's Chemistry," IX(1819), 113-135.
"Geology of the Northern States /Eaton/ "XI(1820),223-239.
"Hayden's Geological Essays," XII(1821), 134-149.
"Silliman's Journal of Science and the Arts," XIII(1821), 247-249.
"Hale's Dissertations," XIV(1822), 251-264.
"Philosophy of Natural History," XIX(1824), 395-410.
"Bigelow's Florula Bostoniensis," XX(1825), 221-224.
"Robinson's Catalogue of Minerals, XXI(1825), 233-234.
"Say's American Entomology, XXI(1825), 251-252.
"American Philosophical Transactions," XXII(1826),1-13.
"Dr. Webster's Manual of Chemistry,"XXIII(1826),349-355
"Wilson's and Bonaparte's Ornithology," XXIV(1827),110-129.
"Godman's Natural History,"XXIV(1827),467-468.
"Bigelow's Elements of Technology,"XXX(1830), 337-360.
"Geology /Eaton/, "XXII(1831), 471-490.
"Silliman's Chemistry,"XXXIV(1832), 79-91.
"Audubon's Biography of Birds," XXXIV (1832), 364-405.
"Decandolle's Botany," XXXVIII (1834), 32-63.
"Hayward's Physiology of Man," XXXIX (1834), 395-412.
"Audubon's Biography of Birds," XLI(1835), 194-231.
"Professor Hitchcock's Report on the Geology, etc. of Massachusetts," XLII (1836), 422-448.
"Boston Journal of Natural History," XLIII (1836), 278-280.
"American Forest Trees," XLIV (1837), 334-361.
"Peirce's Natural Philosophy," XLIV (1837), 550-551.
"Dr. Jackson's Geological Survey," XLV(1837), 240-243.
"Dr. Jackson's Geology of Maine," XLVII (1838), 241-244.
"Geology and Zoology of Massachusetts /Hitchcock/, XLVII (1838), 250-253.
"Bowditch's Translation of the Mécanique Céleste," XLVIII (1839), 143-180.
"Holbrook's North American Herpetology," XLIX (1839), 145-155.
"Ornithology /Audubon/," L(1840), 381-404.
"Morton's Crania Americana," LI (1840), 173-186.

Port Folio:
"Wilson's Ornithology," XII(1814), 578-583.
"Wistar's Anatomy," XIII (1815), 75-77.
"Memoirs of the Philadelphia Agricultural Society," XIII (1815), 404-416.
"Hosack on Contagion," XIV(1815), 399-400.
"Bowditch's Translation of Laplace's Mechanique sic Celeste," XIX (1818), 225.
"Bigelow's American Medical Botany," XX(1818), 46-50.

Quarterly Christian Spectator:
"Review on the Varioloid Small Pox; and the Moral Effects of Prevalent Malignant Diseases," II /n.s./(1830),70-85.
"Review of Silliman's Elements of Chemistry," III(1831), 144.

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Southern Literary Messenger:
"American Journal of Science, & c.," I(1835), 714.
"Western Journal of Medical Science," I(1835), 778-779.
"Maury's Navigation," II(1836), 454-455.
Southern Review:
"Geology and Mineralogy of North Carolina," I(1828), 235-261.
"Geology," VI (1830), 284-307.

II

Among an indefinite number of expressions of the related attitudes thus summarized, these might be mentioned:

George Bancroft, "The Office of the People in Art, Government, and Religion, an Oration Delivered before the Adelphi Society of Williamstown College, in August 1935," in Literary and Historical Miscellanies (New York, 1855), pp. 408-435; D.D. Barnard, Discourse Pronounced at Burlington before the Literary Societies of the University of Vermont, August 1st, 1838; on the Day of the Annual Commencement, Albany, 1838; N. S. S. Beman, Oration Pronounced at Middlebury, before the Associated Alumni of the College, on the Evening of Commencement, August 17th, 1825, Troy, 1825; W. C. Bryant, "The Ages," in Poetical Works, ed. Parke Godwin (New York, 1883), I, 53-67; DeWitt Clinton, "Address before the American Bible Society, 1823," in Life and Writings, ed. W.W. Campbell (New York, 1849), pp. 298-308; "Address ... on Taking the Chair of the Presbyterian Education Society as Its Presiding Vice-President...," in D. Hosack, Memoir of DeWitt Clinton (New York, 1829), p. 180; E. Everett, Orations and Speeches on Various Occasions, Boston, 1850), I, 45-72, 307-328, 404-441; 206-234; T. Ford, Address Delivered before the Literary and Philosophical Society, of South Carolina, on the 18th of November, 1817, on Physical Science, and Particularly the Science of Chemistry (Charleston, S.C., 1818), pp. 3-8; J. Gould, Oration Pronounced at New Haven, before the Connecticut Alpha of the Phi Beta Kappa Society, September 13, 1825, New Haven, 1825; T. S. Grimké, "Address on the Character and Objects of Science (1823), " in Reflections on the Character and Objects of All Science and Literature... (New Haven, 1831), pp. 1-57; J. H. Hobart, The United States of America Compared with Some European Countries, Particularly England (2d ed., New York, 1826), pp.13-19; L. Hubbell, Oration before the Young Men's Association of the City of Albany, at the First Presbyterian Church, July 4, 1835 (especially pp. 17-18); C. J. Ingersoll, A Communication on the Improvement of Government: Read before the American Philosophical Society, at a Meeting Attended by General La Fayette, October 1st, 1924, (Philadelphia, 1824), pp. 5-12; G. Kent, The

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Characteristics and Claims of the Age in Which We Live. An Oration, Pronounced at Dartmouth College, August 23, 1832, before the New Hampshire Alpha of the Phi Beta Kappa Society, Concord, 1832; E. D. MacMaster, A Discourse delivered November 7th, 1838, on the Occasion of the Author's Inauguration as Pfesident of Hanover College, Indiana, Hanover, Indiana,1838; J. Ogilvie, Philosophical Essays (Philadelphia, 1816), Introd., pp. xvii-xviii; D. Olmstead, An Oration on the Progressive State of the Present Age; Delivered at New Haven, before the Connecticut Alpha of the Phi Beta Kappa, September 11, 1827, New Haven, 1827; W. H. Prescott, "Irving's Conquest of Granada," N. Am. Rev., XXIX (1829), 296-297; R. Rantoul, Memoirs, Speeches and Writings, ed. Luther Hamilton (Boston and Cleveland, 1854), pp. 157-183; G. Spring, A Tribute to New England: A Sermon, Delivered before the New-England Society of the City and State of New York, on the 22d of December, 1820; Being the Second Centennial Celebration of the Landing of the Pilgrims at Plymouth, New York, 1821; W. Sullivan, Discourse Delivered before the Pilgrim Society, at Plymouth, on the Twenty Second Day of December, 1829 (Boston, 1830), pp. 15-17; W. Tudor, Letters on the Eastern States (2d ed., Boston, 1821), pp. 128-139; F. Wayland, The Duties of an American Citizen; Two Discourses, Delivered in the First Baptist Meeting House in Boston, on Thursday, April 7, 1825, the Day of Public Fast, Boston, 1825; J. G. Whittier, "Pennsylvania Hall," in Writings, Riverside Edition (Boston and New York, 1894), III, 58-63; L. Woodbury, Writings (Boston, 1852), III, 9-23, 75-95.

See also following: American Journal of Education, IV (1829), 23-29; Christian Examiner, VII (1829), 1-21; IX (1830), 258; XVI (1834), 1-21; New England Magazine, III (1832), 279; North American Review, XXVI (1828), 316-356; XXXI (1830), 66; L (1840), 43-75; Southern Literary Messenger, I (1835), 405-421; V (1839), 24; Southern Quarterly Review, III (1843), 263-317; Southern Review, IV (1829), 70-77; V (1830), 319-337; VII(1831), 247-249; United States Magazine and Democratic Review, VIII(1840), 67-87.

III

Some notion of the interest evoked by phrenology in these years may be derived from the following. Poole's Index, incomplete as it is, lists over 30 articles published before 1840 on the subject, and included is the sober North American Review. American publishers produced the works of Gall, Spurzheim, Combe and their American disciples in astonishing numbers. Gall's Manual of Phrenology was published in Philadelphia the same year, 1835, that Marsh, Capen and Lyon brought out, as the first item

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in the Phrenological Library, Gall's On the Functions of the Brain and of Each of Its Parts, 6 vols. Spurzheim's works appeared as follows: Anatomy of the Brain, with a General View of the Nervous System, first American edition, ed. Charles H. Stedman, Boston, 1834; Education: Its Elementary Principles, Founded on the Nature of Man (eight editions by 1847; first edition in 1832 under title View of the Elementary Principles of Education); Examinations of the Objections Made in Britain against the Doctrines of Gall and Spurzheim, Boston, 1833; Observations on the Deranged Manifestations of the Mind, or Insanity, Boston, 1833; Outlines of Phrenology, Boston, 1832 (three editions by 1834); Philosophical Catechism of the Natural Laws of Man, Boston (three editions by 1833, a sixth edition in 1851); Phrenology, in Connexion with the Study of Physiognomy, Boston, 1833; Phrenology, or the Doctrine of the Mental Phenomena, Boston, 2 vols., (three editions by 1834); Sixty Phrenological Specimens Described, Boston, 1832. Combe was represented in this country by at least the following editions of his writings: An Address Delivered at the Anniversary Celebration of the Birth of Spurzheim, and the Organization of the Boston Phrenological Society, Dec. 31, 1839, Boston, 1840; The Constitution of Man Considered in Relation to External Objects, Boston (ten editions in as many years, between 1829 and 1839); Elements of Phrenology, Philadelphia and Boston (four editions by 1835); Essays on Phrenology, or an Inquiry into the Principles and Utility of the System of Drs. Gall and Spurzheim, and into the objections Made Against It, Philadelphia, 1822; Lectures on Moral Philosophy: Delivered before the "Edinburgh Philosophical Society," and Reported for the "Edinburgh Chronicle," Boston and New York, 1836; Lectures on Phrenology, Including Its Application to the Present and Prospective Condition of the United States, New York, 1839; Lectures on Popular Education; Delivered to the Edinburgh Association for Procuring Instruction in Useful and Entertaining Science, in April and November, 1833, and Published by Request of the Directors of the Association, Boston, 1834 (a second edition in 1839); Moral Philosophy; or, the Duties of Man Considered in His Individual, Social, and Domestic Capacities, New York, 1842; Notes on the United States of North America, During a Phrenological Visit in 1838-9-40, Philadelphia, 1841; A System of Phrenology, Boston (six editions by 1839). This does not presume to be a complete bibliography of the works of the three major exponents of phrenology; it lists only those works and editions listed in the U.S. Library of Congress Depository Catalogue, and those mentioned in the North American Review to 1840. Besides these, we have various native products, the most outstanding being those of the Fowlers - Orson Squire Fowler and Lorenzo Niles Fowler: Amativeness: or, Evils and Remedies of Excessive and Perverted Sexuality, Including Warning and Advice to the Married and Single, New York (a 40th ed. claimed in 1844!); Education and Self-Improvement, Founded on Physiology

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and Phrenology: or, What Constitutes Good Heads and Bodies, and How to Make Them Good, by Enlarging Deficiencies and Diminishing Excesses, New York and Boston, 1844-1846, 3 vols. in 2; Phrenology Proved, Illustrated and Applied, New York (62d ed. claimed in 1850); Religion; Natural and Revealed: or, the Natural Theology and Moral Bearings of Phrenology and Physiology, 2d ed., New York, 1844; Marriage; Its History and Ceremonies, with a Phrenological and Physiological Exposition of the Functions and Qualifications for Happy Marriages, New York, 1847 (12th thousand claimed with this issue); The Principles of Phrenology and Physiology Applied to Man's Social Relations; with an Analysis of the Domestic Feelings, New York, 1842; Temperance, Founded on Phrenology and Physiology, New York, 1842. The Fowlers also published the American Phrenological Journal. There were a host of other phrenological handbooks issued in these years, by obscure men who apparently believed in riding with the tide. There was a Practical Phrenology by Silas Jones, Foster's Practical Phrenology, Simplified, a Synopsis of Phrenology by a Joshua T. Smith, Joseph A. Warne's Phrenology in the Family, a New System of Phrenology by J.S. Grimes, and an Illustrations of Phrenology edited by G. H. Calvert, not to mention an Alphabet of Phrenology by a Dr. H. T. Hudson of New York. A Mrs. L. Miles produced Phrenology, and the Moral Influence of Phrenology, Philadelphia, 1835; and there were Dr. Charles Caldwell's Thoughts on the True Mode of Improving the Condition of Man, Lexington, 1833, and Phrenology Vindicated, and Anti-Phrenology Unmasked, New York, 1837 (originally published in the Annals of Phrenology, I(1833), Boston. Several periodicals in the field also appeared: Phrenological Almanac (1839-1844); Phrenological Gem, New York and Boston, 1836; Journal of the Phreno-Magnetic Society of Cincinnati, I (1842), and the Annals already mentioned.

There were, it should also be noted, phrenological societies in New York City, Philadelphia, Boston, Washington, Buffalo, Hingham, Nantucket, South Reading, Leicester, Worcester, Hanover - in Massachusetts, Providence, R.I., and Hartford, Conn. Phrenological clubs were organized at colleges. (For information on phrenological societies, cf. the Phrenological Journal (Edinburgh), V (1829), 355; VIII(1834), 279, IX(1836), 286; XIV(1841), 292; Eclectic Journal of Medicine (Philadelphia), IV(1840), 309-310.

Of the United States, the Phrenological Journal in 1836 (p. 286) declared with some gratification:

> The Boston Medical Magazine defends Phrenology in an unqualified manner; and the reprints of Mr. Combe's System and Elements of Phrenology, etc., and of Dr. Spurzheim's Observations on Mental Derangement, have met with a very rapid sale. In short, the prospect from the other side of the Atlantic is cheering beyond expectation.

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> Evidence of the popularity of phrenology at this time is also provided by one of its opponents, the Rev. F.H. Hedge, who explains this popularity "among the unlearned" as the result of aspirations towards a philosophy of some sort in conjunction with a disposition against the labor of hard reading requisite to master more profound systems of philosophy. Christian Examiner, XVII(1834), 267-268.

IV

An examination of Locke's Essay Concerning Human Understanding will disclose the fundamentals components of the naturalistic ideology described here (pp. 174-176). Actually, Locke did not exclude a fundamental disposition or "power" of mind - a "power" that made possible the immediate experience of agreement and disagreement in the objects of perception; which recognition he, himself, is willing to call "intuitive knowledge" (IV.ii.1; IV.x.3). Hence, even when he admits the need of demonstration in attaining knowledge, he brings in intuition as essential in each step of the demonstration, to make possible the acceptance of that which is being demonstrated (IV.ii.7). However, Locke is quick to remind us that it would be a mistake to argue from this that "all reasoning was ex praecognitis et praeconcessis" (IV.ii.8). And he not only places definite limitations upon intuitive knowledge (making it little more than a simple perceptive act) (IV.iii.3); but never departs from his basic empiricism: the position that all general ideas, even mathematical axioms, must be built upon particular experiences - upon sense-data (IV.12.1-3).

Locke himself did not draw the naturalistic inferences noted here, it is true; that remained for later empiricists such as Robert Owen and Herbert Spencer. But the extension of ideas by such later thinkers was entirely in accord with the spirit, the method and the content of Locke's philosophy. In the first place, we have his sensationalism - the tabula rasa psychology. In his own words:

> If it shall be demanded then, when a man begins to have any ideas; I think the true answer is, when first he has any sensation. (II.ii.23)

Eudaemonism is an integral part of this pattern; good and evil are reducible to simple experiences of pleasure and pain:

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> Good and evil...are nothing but pleasure or pain, or that which occasions, or procures pleasure or pain to us. Moral good or evil then is only the conformity or disagreement of our voluntary actions to some law, whereby good or evil is drawn on us by the will and power of the lawmaker; which good and evil, pleasure or pain, attending our observance, or breach of the law, by the decree of the lawmaker is that we call reward and punishment. (II.xxviii.5)

The laws of nature decreed by the Creator or the Creative Principle would be, then, the "touchstone of moral rectitude," which man-made laws attempt to approximate. The laws of nature are made known and enforced by pain or pleasure, disease or health, consequent upon obedience or violation (II.xxviii.5-20).

It would seem to follow then that ethical conduct can be assured if the proper association of pleasure and pain with different experiences is effected. It only remained to attain that knowledge of man and his environment needed to create conditions that would bring about the right associations. Such knowledge would receive formulation in moral principles. These, for Locke, are discoverable by reason; that is, natural law, as the basis of morality, can be disclosed by the power of "natural reason" interpreting data of experience. All of which would seem to point to a manifesto of faith in natural science as the mighty instrument for making known the laws of nature, of which moral precepts were merely the adumbration. But it did not so with Locke. True, he believed that morality could be made a demonstrable science (IV.iii.18; xii.8), but he dwelt in an atmosphere of rationalism. He saw the demonstration of moral truths as analogous with the demonstration of mathematical truths. Mathematics was for Locke the source of true ideas of the universe.[1] Later empiricism was to place more emphasis upon,

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[1] cf. A.N. Whitehead, Science and the Modern World (New York, 1926), pp. 48-49:

> As the result of the prominence of mathematicians in the seventeenth century, the eighteenth century was mathematically minded... An exception must be made of the English empiricism derived from Locke.

This unqualified and general exception, if it applies to Locke himself and not merely to the derivation, is not sanctioned by Locke's text. That he points to later empiricism is, of course, true - and that is my very contention.

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have greater faith in, the investigation, classification, recording of the characteristics of natural phenomena; the scientists of the later nineteenth century were preoccupied with the phenomenal stuff itself of the world and the means of achieving power over it. They tended to subordinate the role of mathematics in their scheme of things. (Cf. Whitehead, Science and the Modern World, pp. 23-24, also ch. ii; Locke, op.cit., IV.xii.)

With the rationalistic character of Locke's thought went his fundamental scepticism with regard to man's power to uncover the nature of the physical world: his belief in the unknowability of substance and inner relations, which prevented him from becoming too optimistic about the possibilities of physical science:

> I deny not but a man, accustomed to rational and regular experiments, shall be able to see farther into the nature of bodies, and guess righter at their unknown properties, than one that is a stranger to them; but yet, as I have said, this is but judgment and opinion, not knowledge and certainty. This way of getting, and improving our knowledge in substance only by experience and history, which is all that the weakness of our faculties in this state of mediocrity, which we are in this world, can attain to, makes me suspect, that natural philosophy is not capable of being made a science. We are able, I imagine, to reach very little general knowledge concerning the species of bodies, and their several properties. Experiments and historical observations we may have, from which we may draw advantages of ease and health, and thereby increase our stock of conveniences for this life; but beyond this, I fear, our talents reach not, nor are our faculties, as I guess, able to advance. (IV.xii.10.)

However, despite its combination of rationalism and scepticism, Locke's thought pointed to the scientific naturalism of a later age. It was not without significant Baconian characteristics. Although contending that it is through reason that we can attain to a knowledge of God as of morality, he insists that reason must act on experience, must follow the inductive method (VI.xii.7-8; IV.x). Further he gives us moral principles that are integrated with pleasure and pain, the whole comprising an aspect of natural law.[2] Hence, it is

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[2] Cf. Mattoon M. Curtis, An Outline of Locke's Ethical Philosophy. Inaugural dissertation presented to the University of Leipzig for the Degree of Doctor of Philosophy, Leipzig, 1890.

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necessary in dealing with Locke's thought, to qualify his rationalism with his emphasis upon the inductive method in connection with natural law. However limited the powers of reasoning and observation seemed to Locke, he insists upon their use as man's sole instruments of knowledge, and not upon the use of either intuition or imagination. In testing principles, then, his ultimate appeal is to experience. As a consequence, the way is open (once we have overcome a clinging scepticism with regard to the knowability of substantial beings and inner relations of natural phenomena) for sanguine advocacy of scientific method in making known those laws of nature in which morality, like health, is rooted. And therewith is to be produced the Baconian assurance that knowledge is power. Given greater faith in physical science, Lockean associationism slips readily into scientific naturalism. If, as Locke argues, desires and antipathies are conditioned by association (II.xxxiii), then the true and the good in thought and action are achieved by providing the associations that will evoke desires and antipathies for the right things - that being harmony with natural law. Now this accord is made possible only by understanding the way in which mind and body are affected by different conditions. Given the Baconian's faith in science and the idea of the natural order as embracing the whole of the human psyche,[3] and scientific method enters as the basis of individual and social melioration. In this full stage is Robert Owen.

As added evidence of kinship between Locke's views and those of Baconians of a later day are, first, his contempt for scholastic philosophy, and second, his declaration (despite his sceptism) of the power of science and technology to shape the life of man. Thus, speaking of the "abuse of words", he censures the "logic and dispute" of the "philosophers of old...and the schoolmen since," who

> aiming at glory and esteem for their great and universal knowledge, easier a great deal to be pretended to, than really acquired, found /it/ a good expedient to cover their ignorance, with a curious and inexplicable web of perplexed words, and procure to themselves the admiration of others by unintelligible terms, the apter to produce wonder, because they could not be understood: whilst

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[3] "All the great ends of morality and religion are well enough served, without philosophical proofs of the soul's immateriality..." (Locke, op. cit., IV.iii,6.)

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> it appears in all history, that these profound doctors were no wiser, nor more useful than their neighbors, and brought but small advantage to human life, or the societies wherein they lived: unless the coining of new words, where they produced no new things to apply them to, or the perplexing or obscuring the signification of old ones, and so bringing all things into question and dispute, were a thing profitable to the life of man, or worthy commendation and reward.
>
> (III.x.8)

On the other hand,

> it was to the unscholastic statesman, that the governments of the world owed their peace, defence, and liberties; and from the illiterate and contemned mechanic (a name of disgrace) that they received the improvements of useful arts. (III.x.9)

Further, the Promethean theme:

> Of what consequence the discovery of one natural body, and its properties, may be to human life, the whole great continent of America is a convincing instance; whose ignorance in useful arts, and want of the greatest part of the conveniences of life, in a country that abounded with all sorts of natural plenty, I think, may be attributed to their ignorance of what was to be found in a very ordinary despicable stone, I mean the mineral of <u>iron</u>. And whatever we think of our parts or improvements in this part of the world, where knowledge and plenty seem to vie with each other; yet to any one that will seriously reflect on it, I suppose it will appear past doubt, that were the use of <u>iron</u> lost among us, we should in a few ages be unavoidably reduced to the wants and ignorance of the ancient savage Americans, whose natural endowments and provisions come no way short of those of the most flourishing and polite nations.
>
> (IV.xii.11)

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V

The history of the free school movement in America may be found in any account of the development of the nations educational system. See, for example, Ellwood P. Cubberley's Public Education in the United States (Boston and New York, 1934), ch. vi.

> The second quarter of the nineteenth century may be said to have witnessed the battle for tax-supported, publicly controlled and directed, and non-sectarian common schools. In 1825 such schools were the distant hope of statesmen and reformers; in 1850 they were becoming an actuality in almost every Northern State.
>
> Ibid., p. 164.

The idea that popular education was indispensable to the safety and preservation of a free government was reiterated persistently during this period. Thus New York's Governor Clinton, in his message to the state legislature, January 1820--one of any number of expressions of the same sentiment:

> The stability and duration of republican governments depend upon the ascendancy of knowledge and virtue. The mind duly enlightened and the heart properly cultivated, can never submit to the dominion of anarchy or despotism.
>
> Messages from the Governors, ed. C. Z. Lincoln (Albany, 1909), II, 1018.

The contention recurs in every one of Clinton's annual gubernatorial messages. And governors in many other states are found expressing the same sentiment. AJE, II (1827), 113-114. Some writers of the period pictured all men now as 'laborers' in the universally democratized society; others were willing only to applaud America, as ahead of the old world in the process of democratization. It is at times remarked by the 'economic interpreter' of history, that behind the movement for popular education lurked the fear of the propertied classes that political power in the hands of the propertyless working masses would be dangerous unless accompanied by a sound schooling, including the inculcation of reverence for certain moral tenets, notably the inviolability of private property. This question need not be considered here, however--

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further than to remark that, whatever the emphasis, nineteenth-century liberals felt that an educated people (and especially a people practically educated) was essential to the preservation of the institutions they (the liberals) believed to be free. Cf. J[ohn] D[ewey], "Philosophy of Education," Cyclopedia of Education, IV, 702.

Following are only a few of the possible sources of evidence indicating the relationship seen between popular (and usually 'practical') education and free institutions: Academician, I(1818), 14-16; American Journal of Education, I(1826), 220-230; II(1827), 315-316, 434-442, 443-445 (succeeding volumes, passim); American Library of Useful Knowledge, vol. II, Preface, pp. 1-8; S. H. Blake, Address Delivered before the Association of Teachers, and Friends of Popular Education, at Exeter, Dec. 28, 1836 (Bangor, 1837), pp. 6-11; B. F. Butler, "Discourse Delivered before the Albany Institute ... April 23d, 1830," in Transactions Albany Institute, I, 172; J. G. Carter, Essays upon Popular Education ... (Boston, 1826), pp. 48-49; J. G. Carter, Letters to the Hon. William Prescott, Lld. on the Free Schools of New England, with Remarks upon the Principles of Instruction (Boston, 1824), p. 3; E. H. Chapin, "Anniversary Address Delivered before the Richmond Lyceum ... April 3d, 1839," Southern Literary Messenger, V(1839), 725-733; "Common Schools," New England Magazine, III(1832), 206-207; Cubberley, Public Education, pp. 165-166; [Orville Dewey], "Diffusion of Knowledge," ibid., XXX(1830), 296-297; Samuel Eels, "Address before the College of Teachers in Cincinnati," in James Eels, Memorial of Samuel Eels (Cleveland, 1873), pp. 88-89; Stephen Elliott, "Address to the Literary and Philosophical Society of South Carolina," Analectic Magazine, VIII(1816), 169; [A. H. Everett], "Popular Education," North American Review, XXXV(1833), 74, 88-94; Franklin Institute and American Mechanics' Magazine, I(1826), 66-67, 254; Isaac Goodwin, Oration Delivered at Lancaster, February 21, 1826 (Worcester, 1826), p. 13; John Griscom, Discourse on Character and Education (New York, 1823), pp. 6-7, 11-13; J. D. Hammond, Address Delivered before the Otsego County Education Society, October 10th, 1838 ([Cooperstown], 1839), p. 2; W. R. Johnson, Observations on the Improvement of Seminaries ... (Philadelphia, 1825), pp. 7-8; Johnson, "On the Combination of a Practical with a Liberal Course of Education," Journal of the Franklin Institute, II(2d series) (1828), 55-56; Journal of the Proceedings of a Convention of Literary and Scientific

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Gentlemen, Held in the Common Council Chamber of the City of New York, October, 1830 (New York, 1831), pp. 171-172; Joseph Lancaster, Letters on National Subjects ... (Washington City, 1820), pp. 23-24; Philip Lindsley, Life and Works (Philadelphia, 1859-1866), I, 22-25, 340-341, 398-404; C. F. Mercer, Discourse on Popular Education (Princeton Press), pp. 10-11, 31-33, 38-40; Lucian Minor, "Address on Education, as Connected with the Permanence of Our Republican Institutions, Delivered before the Institute of Education at Hampden Sidney College," Southern Literary Messenger, II(1836), 17-24; Samuel Nott, "On a Proper Education for an Agricultural People," Introductory Discourse and Lectures Delivered before the American Institute of Instruction ... August, 1835 (Boston, 1836), pp. 53-56; L. H. Parsons, Inquiry into the Kind and Extent of Education, Demanded by the Ordinary Circumstances, Duties, and Wants of Life (Doylestown, Pa., 1837), p. 12; S. C. Phillips, "On the Usefulness of Lyceums," Introductory Discourse and Lectures Delivered before the American Institute of Instruction ... August, 1833 (Boston, 1834), pp. 21-33; Alonzo Potter, Address before Mechanics' Literary and Benevolent Society (Schenectady, 1836), pp. 5-10, 19-20; "Proceedings and Report of the Commissioners for the University of Virginia; Presented December 8, 1818," reprinted in Analectic Magazine, XIII(1819), 107-109 (or, see H. B. Adams, Thomas Jefferson and the University of Virginia, U. S. Bureau of Education Circular of Information, No. 1 [Government Printing Office, 1888], pp. 88-89); "Proposed Institution in Massachusetts," AJE, I(1826), 86-89, 154-156; Robert Saunders, "Address Delivered before the Students of William and Mary College," Southern Literary Messenger, V(1839), 596; W. H. Seward Works (New York, 1853), II, 135-152; III, 208-210, 228; C. E. Stowe, Report on Elementary Public Instruction in Europe, Made to the Thirty-Sixth General Assembly of the State of Ohio (Boston, 1838), p. 9; William Sullivan, "Introductory Lecture," American Institute of Instruction Lectures, 1833, pp. 21-33; United States Literary Gazette, II(1825), 279, 471; II(1825), 71-73; IV(1826), 113-114, 132-133; United States Review and Literary Gazette, I(1826), 130; II, 1827; G. C. Verplanck, Discourse and Addresses on Subjects of American History, Arts and Literature (New York, 1833), pp. 245-249; [Timothy Walker], "Popular Education," North American Review, XXIX(1829), 257-258; Henry Ware, Jr., Works (Boston and London, 1846-1847), II, 218-219; Emory Washburn, "On the Political Influence of School Masters," American Institute of Instruction Lectures, 1835, pp. 61-87;

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Francis Wayland, Duties of an American Citizen ... (Boston, 1825), pp. 36-38; Charles White, "On the Literary Responsibility of Teachers," American Institute of Instruction Lectures, 1838, pp. 19-23.

In this connection it might be noted that the 'power' of knowledge could be interpreted as 'political power.' Cf. "Observations on the Rise and Progress of the Franklin Institute," Franklin Institute Magazine, I(1826), 66.

The Lancastrian or monitorial system received ardent support precisely because it seemed to make free universal education economically feasible. Griscom deemed that the Lancastrian system, "Or the art of managing large schools at a very small expense," which "is evidently gaining ground," as "doubtless" the "most valuable practical discovery, in relation to human happiness with which the world has been recently blessed." Year in Europe, I, 105-106. Cf. also: Academician, I(1818-1819), 100-102, 236-240; "A Manual of the System of Monitorial or Mutual Instruction," American Journal of Education, I(1826), 335-348; Ibid., I, 32-42, 72-80, 160-166, 459-475; III, 283-296, 385-397; William Russell, Manual of Mutual Instruction: Consisting of Mr. Fowle's Directions for Introducing in Common Schools the Improved System Adopted in the Monitorial School, Boston, Boston, 1826; Vera M. Butler, Education as Revealed by New England Newspapers Prior to 1850, pp. 328-350; Cubberley, Public Education, pp. 134-136.

VI

77 Fellenberg's school at Hofwyl was an inspiration to many educators in America. The Massachusetts proposal of 1825, already discussed grew out of the discussions which followed the establishment of Mechanics' Institutes in England, Fellenberg's Schools at Hofwyl, and the Rensselaer School at Troy-- and the want, long and wisely felt, of some essential modification of the studies of the academies and colleges of the country.

Barnard's Journal of Education, VIII(1873), 268.

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On account of Fellenberg's school and a tribute to its founder was conveyed by William Woodbridge in 1830 to a convention in New York City, attended by political and educational leaders of the country. Journal of the Proceedings of a Convention of Literary and Scientific Gentlemen, Held in the Common Council Chamber of the City of New York, October, 1830 (New York, 1831), pp. 109-111. Woodbridge also presented a rather extensive report on the Fellenberg school in the first and second volumes of his Annals of Education. The report was issued in parts throughout the years 1831 and 1832. A. D. Bache's Report on Education in Europe also contained a comprehensive account of the school at Hofwyl (pp. 306-310). Bache, who was president of Girard College at the time, declared: "The establishments for education at Hofwyl have attracted more attention probably than any other educational institutions in the world." Ibid., p. 306. In connection with a "Report on the Manual Labor Academy of Pennsylvania," we read in the Annals of Education, I(1831), 38:

> To Salzman, Pestalozzi, Fellenberg, and their contemporaries, seems to have been reserved the glory of proving to the world ... that mental and moral improvement can be far more successfully prosecuted by devoting a portion of time daily to agriculture, horticulture, or other manual labor--to such exercises, in a word, as shall preserve the health of the body unimpaired--than by spending the whole day in intellectual and moral, to the neglect of physical exercise.

Cf. also "Fellenberg," Cyclopedia of Education, II, 590-591; Academician, I(1819), 324-327; American Journal of Education, I, 32-42, 72-80, 160-166; II, 374-376; "A Remarkable Institution for Education in Switzerland," Christian Disciple, IV(1816), 313-314; L. F. Anderson, "The Manual Labor School Movement," Educational Review, XLVI(1913), 369-386; V. M. Butler, Education as Revealed by New England Newspapers Prior to 1850, pp. 196-198; Beriah Green, "On Uniting in a System of Education, Manual with Mental Labor," American Institute of Instruction Lectures, 1834, pp. 189-206; J. Griscom, "Fellenberg and Hofwyl," Barnard's Journal, XXXI, 269-280 (being an extract from Griscom's Year in Europe, pp. 382-401); Augustus B. Longstreet, "Address Delivered before the Faculty and Students of Emory College, Oxford Georgia," Southern Literary Messenger, VI(1840), 651-652; John Millington, "Address on Civil Engineering,"

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Southern Literary Messenger, V(1839), 592-595; A. Potter, Principles of Science, pp. 399-401; Quarterly Christian Spectator, II(1830), 358-366; S. H. Tyng, The Importance of Uniting Manual Labour with Intellectual Attainments ..., Philadelphia, 1830.

The school established at New Harmony by Robert Owen and William Maclure ("Father of American Geology") was not only an instance of the spread of the Fellenberg idea in the United States, but also important in the spread of interest in natural history. AJE, I, 377-378; W. M. and M. S. C. Smallwood, Natural History and the American Mind (Columbia University Press, 1941), pp. 144-146.

VII

The old standard curriculum of colleges during the early nineteenth century was described thus by Professor Vethake of Princeton, before a convention on education held in New York City in 1830:

> The students of our colleges, it is well known, are almost universally divided into four different classes, viz: the Freshman, Sophomore, Junior, and Senior Classes. The course of study in each of them endures for a year, and is the same for every student, whatever may be his capacity or tastes. A candidate for admission to the Freshman ... class, besides possessing a competent knowledge of the various branches of ... an English education ... must come prepared to be examined on ... classical (Greek and Latin) authors; and the Greek and Latin languages are also usually the principal subjects of study during the first two years of the collegiate course, the sciences only becoming predominant objects of the students' attention in the Junior and Senior years. The instruction in the different sciences, Mathematical, Physical and Moral, is, generally speaking, conducted almost entirely by recitation from a text book, with remarks less or more extended, on the part of the teacher.

Journal of the Proceedings of a Convention of Literary and Scientific Gentlemen, Held in the Common Council Chamber of

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the City of New York, October, 1830 (New York, 1831), p. 22. Cf. also C. F. Thwing, History of Higher Education, pp. 300-303. Thwing concludes (p. 301):

> The most conspicuous and impressive addition made to the course of study in the first decades of the last century we find in the field of science.

This addition was by no means even and unhesitating. Some colleges, such as Williams, were markedly conservative, her catalogue revealing no essential deviation from Vethake's description even as late as 1850. Further, in 1822 the president of the College of New Jersey, Dr. Ashbel Green (a friend of classical learning), fought in vain to prevent the abolition there of the chair of natural philosophy. Life of Ashbel Green, ed. Joseph H. Jones (New York, 1849), pp. 347, 427. Moreover, the Greek and Latin requirement for the regular course remained in force at all colleges for a long time. Even in the 'modernist' University of Virginia in the academic year 1826-7, there were 107 students taking ancient languages, to 43 studying natural philosophy and 45 natural history. AJE, II, 56. However, the trend was unmistakable. Besides the expansion of scientific studies, there were early evidences of this. At both Geneva College and Transylvania University the equivalent (on college level) of the "English Course" of the academies was instituted. In this course the ancient languages were not studied; nor were they required for entrance. Cf. Hobart, The Story of a Hundred Years, 1822-1922, Documentary Appendix, pp. 98-99; Observations upon the Prospect for Establishing Geneva College, New York, 1824; AJE, III (1828), 553-555; Western Monthly Review, I(1828), 394-395. The faculty of Amherst suggested such a dual departmental system in 1826:

> One fact, we take it, is becoming more and more obvious every day. The American public is not satisfied with the present course of education in our higher seminaries. And the great objection is, that it is not sufficiently modern and comprehensive, to meet the exigencies of the age and country in which we live. Not that the general voice seems to be hostile to the Ancient Classics. Any college may, without serious opposition, retain both the Latin and Greek languages for the majority of its sons--may insist more strenuously than heretofore upon

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> the study of the abstruse sciences, and may multiply its requisitions in every existing department, provided it will at the same time open its doors to that large class of young men, who are not destined to either of the learned professions, and carry them through a course, which they think better adapted to their future plans and prospects. The complaint is, and if our ears do not deceive us, it daily waxes louder and louder, that while everything else is on the advance, our Colleges are stationary; or if not quite stationary, that they are in danger of being left far behind, in the rapid march of improvement.
>
> Substance of Two Reports, pp. 5-6

That a knowledge of the dead language should not be required of youth destined for business or farming is argued emphatically in this report (pp. 6-7).

At Harvard, a report (1824) of a Committee of the Overseers, growing out of a controversy over discipline and instruction at the College, recommended that

> to meet the demand for scientific knowledge in the mechanical and useful arts, students ... be admitted for instruction who do not wish for a degree, and 'to pursue particular studies to qualify them for scientific and mechanical employment and the active business of life.'
>
> Quincy, History of Harvard II, 347

This recommendation was finally adopted in 1825. Ibid., p. 353.

At about this time the Regents of the University of New York in a report

> recommended the establishment of a school of Agriculture, Mechanics, and the useful Arts to be connected with each college in that state, to instruct the manufacturer, the mechanic, journeyman, apprentice, and laborer, in the principles upon which successful practice, in their several occupations depends.
>
> AJE, I, 252

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Public demand for scientific and technological education accumulated sufficient weight to effect, amid the war agony of 1862, the passage of the Morrill Act.

Cf. R. G. Boone, Education in the United States (New York, 1909), pp. 223-236; E. G. Dexter, A History of Education in the United States (New York, 1904), pp. 343-369; G. B. Goode, "The Origin of the National Scientific and Educational Institutions of the United States," in Papers of the American Historical Association, vol. IV (New York and London, 1890), Pt. ii; C. F. Thwing, op. cit., pp. 421-422.

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VIII

Each of the following reiterates some or all of the arguments adduced in support of the study of physical sciences: (1) that it increases man's power over nature, thus advancing civilization; (2) that it nourishes, elevates and provides wholesome discipline for the intellect (i.e. trains the mind in orderly habits, develops powers of observation, strengthens the reason, dispels superstition, corrects prejudice and fosters a truth-seeking attitude); (3) that it refreshes the spirit and purifies the heart; (4) that it promotes morality and piety. Academician, I(1819), 279-281, 307-309; William Allen, "An Inaugural Address, Delivered in Brunswick, May 16, 1820, on Entering upon the Duties of President of Bowdoin College, 1820," on Entering upon the Duties of President of Bowdoin College," in A Decade of Addresses, Delivered from 1820 to 1829 ... (Concord, 1830), pp. 22-24; American Annals of Education, I(1830), 116-117; American Journal of Education I(1826), 554, 634-635; III(1828), 263; IV(1829), 58-64, 168-175; American Quarterly Review, VI(1829), 73-104; Analectic Magazine, X(1817), 233-255; Rufus Anderson, "Importance of Teaching Science to the Heathen," American Quarterly Observer, II(1834), 24-35; Atlantic Magazine (1825), 315-318; Benjamin F. Butler, "Albany Institute Anniversary Address, 1830," in Transactions of the Albany Institute, I(1830), 166-175; Thomas Cushing, Jr., "On the Results to be Aimed at in School Instruction and Discipline," American Institute of Instruction Lectures, 1840, p. 38; John Davis, "An Address to the Linnaean Society of New England, at Their First Anniversary Meeting at the Boston Athenaeum, June 14, 1815," North American Review, XXX(1830), 306-313; Stephen Elliott, "Address to the Literary and Philosophical Society of South Carolina," Analectic Magazine, VIII(1816), 162; [John Farrar], "Natural Science," Christian Examiner, VII(1829), 262-268; G., "Essay on the Classification, Mutual Relations, and Various Uses of the Physical Sciences," Analectic Magazine, VI(1815), 126-149; Landon C. Garland, "Address on the Utility of Astronomy," Southern Literary Messenger, IV(1838), 123-130; A. A. Gould, "On the Introduction of Natural History as a Study to Common Schools," American Institute of Instruction Lectures, 1834, pp. 289-309; John Griscom, Discourse on the Importance of Character and Education, p. 25; "Introductory Lecture to a Course of Chemistry given before the New York Mercantile Library Association," in John H. Griscom, Memoir of John Griscom, pp. 329-333; Benjamin Hale, "On the Best Mode of Teaching Natural Philosophy," American Institute of Instruction Lectures, 1833, pp. 289-309; Frederick Hall, An Oration on the Importance of Cultivating the Sciences; J. Herschel, "Discourse on the Study of Natural Philosophy," in American Library of Useful Knowledge, I, 267-320; C. T. Jackson, "On

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the History and Uses of Chemistry," American Institute of Instruction Lectures, 1834, pp. 222-224; The Juvenile Philosopher; or Youth's Manual of Philosophy (2d. ed., Geneva, N. Y., 1826), pp. 15-16; Samuel Miller, Discourse Delivered in the Chapel of Nassau-Hall, September 27, 1827, pp. 37-38; New England Magazine, VII(1834), 140-142; North American Review, III(1816), 161-162; L. H. Parsons, Inquiry into Education, pp. 13-14; Port Folio, IX(1820), 86-93; XX(1825), 103-105; Portland Magazine, I(1834), 86-88; [L. Ray], "Decandolle's Botany," North American Review, XXXVIII(1834), 32-35; Sampson Reed, Observations on the Growth of the Mind (new edition, Boston, 1910), pp. 9-10, 40-62; J. Renwick, Outlines of Natural Philosophy (New York, 1826), I, 10; J. L. Russell, "On the Study of Natural History," American Institute of Instruction Lectures, 1837, pp. 71-89; U. S. Literary Gazette, I(1824), 7-8; II(1827), 445-446; Daniel Webster, Writings and Speeches, XIII, 77; Western Monthly Review, II(1828), 247; Emma Willard, Letter, Addressed as a Circular to the Members of the Willard Association, for the Mutual Improvement of Female Teachers; Formed at the Troy Female Seminary, July, 1837 (Troy, 1838), pp. 24-25.

Natural theology represents the most prominent application of science to religious didacticism. Its central thesis has a long history, of course. In American colonial thought also we find the idea that in nature, interpreted by reason, is discovered the will and the glory of God; hence that nature supplements Revelation. (Cf. Theodore Hornberger, American Puritanism and the Rise of the Scientific Mind; a Study of Science and American Literature in the Seventeenth and Early Eighteenth Centuries. A dissertation submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in the University of Michigan, Ann Arbor, 1934.) Among the contemporaries of Bacon in England were also exponents of the view that the study of natural phenomena can be the handmaid to religious faith. Cf. Geoffrey Bullough, "Bacon and the Defense of Learning," in Seventeenth Century Studies Presented to Sir Herbert Grierson (Oxford, 1938), pp. 6-7. Paley, Brougham, the Bridgewater treatises, and the work of the Scotch moralist and scientific writer, Thomas Dick ("better known in America than in Britain") contributed to nineteenth-century America's education on the subject. Cf. "Bridgewater Treatises," Southern Literary Messenger, V(1839), 548-558; Christian Examiner, VI(1829), 389-393; Thomas Dick, The Christian Philosopher, or the Connection of Science and Philosophy with Religion, New York, 1831. ("The object of the volume is to illustrate the harmony which subsists between the system of Nature

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and the system of Revelation; and to show, that the manifestations of God in the material universe ought to be blended with our view of the facts and doctrines recorded in the volume of Inspiration." Ibid., p. ix); "Discourse on Natural Theology," North American Review, XLII(1838), 457-488; Thomas N. Gallaudet, The Youth's Book on Natural Theology; Illustrated in Familiar Dialogues with Numerous Engravings, New York: The American Tract Society, 1832; "[Paley's] Happiness of Animals, a Proof of the Divine Benevolence," in J. Pierpont, American First Class Book, New York, 1835; William Sullivan, The Moral Class Book, or the Laws of Morals; Derived from the Created Universe, and from Revealed Religion, Intended for Schools, Boston, 1833.

IX

Mathew Carey printed Dr. Rush's vehement attack upon classical learning and argument for a practical, scientific and Christian 'English' education, in the American Magazine for June, 1789. The essay appeared under the title, "An Enquiry into the Utility of a Knowledge of the Latin and Greek Languages, as a Branch of Liberal Education, with Hints of a Plan of Liberal Instruction, Without Them, Accommodated to the Present State of Society, Manners, and Government in the United States." Rush was an uncompromising foe of ancient learning, as his exordium indicates (p. 525):

> It requires the recollection of escapes from a lion and a bear, to encounter the strong and universal prejudice, in favour of the Latin and Greek Languages, as a necessary branch of liberal education. If, in combating this formidable enemy of human reason, I should be less successful than the Hebrew stripling was in contending with the giant of the Philistines, I hope it will be ascribed wholly to the want of skill to direct arguments, which, in other hands, would lay this tyrant in the dust.

In his argument Rush covered the major contentions discussed in this chapter: (1) that the moderns enlightened by scientific, rational principles have surpassed the ancients in learning (529-532); (2) that "the study of some of the Greek and Latin classics is unfavourable to morals and religion," and

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that those "free from this censure, contain little else but" glorification of royal murders and the "military character" (526); (3) that the mind is harmed by being applied from early youth to the study of the ancient languages, because such application violates 'nature' which decrees that a "knowledge of things" precede a "knowledge of words" (525, 534); (4) that in any case there should be no question of the "superiority of practical useful knowledge" above "speculative" and abstruse learning (531-532). Rush denies, further, that an acquaintance with Latin and Greek grammar is necessary for an acquaintance with English grammar (526-527); that the ancient languages are a valuable basis for an effective English vocabulary (527-529); and that Roman and Greek writers provide perfect models of taste and eloquence, which must be studied in order to acquire their "taste and spirit" (527-528). In this last connection Rush reveals a naturalist bias, for he argues that the source of perfection is nature itself, and he points to Shakespeare as one who 'spoke from nature' (527). Rush would preserve classical scholarship, but only as a distinct profession of linguistics (532). He adds to this polemic "a short plan of a liberal English education," from which the ancient languages are excluded and in which natural history obtains first place, because to "follow [the] order of nature" we must "begin by instructing our pupil in the knowledge of substances, or things" (533-534). The teaching of Christian principles is also given a vital place in the proposed system (534). Rush's essay was reprinted as "Observations upon the Study of the Latin and Greek Languages ...," in B. Rush, Essays, Literary, Moral and Philosophical (Philadelphia, 1798), pp. 21-56.

Note that the preceding issue of the American Museum (May, 1789), pp. 475-476, carried Benjamin Franklin's "Idea of an English School, for the Consideration of the Trustees of the Philadelphia Academy." As described by Franklin the school would prepare youth for the business of life and accordingly would exclude the study of ancient and modern languages other than English.

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X

A further qualification of the Baconian attitude is necessary here, in view of the fact that the promulgation of the naturalistic assumptions involved, faced the obstacle of a religious tradition postulating the dualism of spirit and matter, and the supreme value and interest of the former. In this view the Bible and firm discipline ("Train up the child in the way he should go!") were indispensable. (But note also that religious scruples could mean condemnation of "pagan literature.") Cf. Jacob Abbott, "On Moral Education," American Institute of Instruction Lectures, 1831, pp. 43-64; W. E. Channing, Works (Boston, 1866), I, Introd., xi-xii; I, 243-280; IV, 67-103; W. H. Channing, Memoir of William Ellery Channing with Extracts from his Correspondence and Manuscripts (Boston, 1848), II, 408; III, 130-131; James M. Garnett, "Address on Associations to Promote Education," Southern Literary Messenger, I(1835), 286; F. W. P. Greenwood, quoted in U. S. Literary Gazette, III(1825), 119-120, and in Christian Examiner, X(1831), 1-14; S. R. Hall, "On School Discipline," American Institute of Instruction Lectures, 1836, pp. 163-177; Mark Hopkins, Miscellaneous Essays and Discourses (Boston, 1847), pp. 9-17, 46-80; Philip Lindsley, Works (Philadelphia, 1859-1866), I, 40-42, 67-76; II("Sermons"), passim; Nathan Lord, An Address Delivered at Hanover, October 29, 1828, at the Inauguration of the Author as President of Dartmouth College, Windsor (Vt.), 1828; "On Religious Instruction," Port Folio, XVII(1824), 224-233; Roswell Park, "On Religious Education," American Institute of Instruction Lectures, 1835, pp. 99-110; Thomas E. Vermilye, An Introductory Address to the Course of Lectures before the Young Men's Association for Mutual Improvement in the City of Albany, Delivered December 19, 1837, Albany, 1837; [Anon.] "View of the State of Religion in the Colleges," Quarterly Register and Journal, I(1827), 31; Henry Ware, Jr., Works (Boston and London, 1846-1847), III, 291; IV, 215-241; William C. Woodbridge, "Editor's Address," American Annals of Education, I(1830), 1-8. John W. Picket was aware of the Rousseauian current of thought, as such, and - Baconian though he was - assailed it; for none of your French romantic notions suited the pious Picket:

> Human nature is too weak, when it has not been properly managed in infancy, to bear up against its own passions and their animal indulgence. Platonic notions, and the wild dreams of Godwin, have had their day. The condition of the civil compact disclaims the idea of insubordination, and proves that men left to reason alone, do not always perform what is right and just.

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And again,

> It is not surprising, that, there should be a reaction upon the doctrine of non-restraint. There was rather too much of Godwin and Rousseau and Owen in it, to last long.
>
> "Necessity of Discipline," Western Academician, I(1837-8), 7, 10.

It must not be forgotten, however, that the 'hard temperament' found religious sanction for the virtue of laboring in one's vocation. Thus Solomon's injunction to learn from the ant became the theme of one contributor to the North American in 1835 (among other writers), who discussed the matter in connection with the study of natural history (XLI, 426-430). The Baconian mind was capable of adaptation or compromise.

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