G. W. ed.

APPENDICITIS.

The modern disease known by the name of appendicitis has become so common that one might be tempted to denominate it a fad were it possible to conceive that any intelligent person would, while in possession of his faculties, seriously undertake to invite an attack of this serious and oft-times fatal malady.

Appendicitis, as its name indicates, is an inflammation of the appendix, or appendix vermiformis, to speak more correctly, of the cecum or first portion of the large intestine or colon. Numerous types, stages, and varieties of the disease have been discovered, but it is not necessary for us to enter into a technical description of the malady. It suffices to say that it is ordinarily accompanied by pain and more or less swelling, which is located at a point about half way between the highest point on the hip bone in front and the umbilicus.

An acute attack of appendicitis is usually accompanied by a chill, a rise of temperature, and severe pain at the point designated. Other serious symptoms are present, as vomiting and indications of serious intestinal disturbance. The symptoms often closely resemble peritonitis. Indeed, peritonitis, or inflammation of the peritoneum, not infrequently accompanies this disease, the inflammation beginning with the appendix and extending to the surrounding structures. Appendicitis may ~~xxxxxxxxxx~~ terminate in recovery within a few days without serious symptoms. An abcess may develop which may discharge into the intestine, the peritoneal cavity, or externally.

Appendicitis is popularly supposed to be most frequently due to the swallowing of small seeds, such as the seeds of grapes, raisins, cherries, and other small fruits. This supposition is not, however, borne out by the observations made by surgeons who have had an extensive experience in the removal of the affected organ, since foreign bodies are very seldom found in the appendix. The writer has removed a good many appendices

and has never yet found a single foreign body, except in one case, which contained a fecal calculus which had evidently been formed within the appendix itself.

It is the writer's opinion that appendicitis is most often the result of catarrh of the large intestine, which extends by contiguity into the appendix. The appendix is separated from the large intestine by a simple sort of valve. As the result of inflammation this valve may be closed, so that secretions accumulate within the appendix, or it may, as the result of other forms of disease, become abnormally relaxed, so that the fecal matter contained in the colon are not excluded from the appendix. In cases of this sort foreign bodies of various kinds may find their way into the little pouch which forms the appendix.

Another cause of irritation and inflammation of the appendix is, in the writer's opinion, to be found in the free use of calomel. This drug, insoluble in the intestineal fluids, often finds its way, when freely used, into the cecum, settling in the pouch-like end of this organ, and the appendix vermiformis, is slowly acted upon by salt or chloride of sodium which comes in contact with it, giving rise to a much more irritating and corrosive chemical compound, viz., bichloride of mercury, an exceedingly irritating and corrosive drug.

That foreign bodies are sometimes found in the appendix is due not directly to the fact that the foreign substance has been swallowed, but to the fact that, as the result of disease, the valve which protects the appendix has become relaxed, so that the mouth of the pouch remains open, ready to recete whatever drops into it.

The question of practical importance which every person suffering from this disease or threatened with it is likely to ask himself is whether an operation is necessary in every case of appendicitis. Scores of times this question has been asked us, and we have been glad to reply, "By no means." The theory held by some surgeons that the appendix is a

useless and dangerous appendage, and in man represents only a biological vestige, is wholly an error. Prof. Andrews, of Chicago, has recently made the sagacious suggestion that the real function of the appendix is to secrete a lubricating mucus which, poured into the colon near the junction of the small intestine with it, readily facilitates the movement of the food residue along the alimentary canal. This view of the function of the appendix seems exceedingly reasonable, so that it must be admitted that the organ cannot be spared so advantageously as some have maintained, and certainly its removal should not be undertaken without abundant reason to believe that such an operation is imperatively necessary.

A very large proportion of the cases of appendicitis may be cured by proper treatment, and the return of the disease may be prevented by proper dietary. For example, quite painful swelling and tenderness may, in the great majority of cases, be removed by a large hot enema, taken twice or more times daily, preferably in the knee chest position, supplemented with fomentations over the lower abdomen, covering the seat of pain. The fomentations should consist of large thick flannels, wrung out of water as hot as can be borne without burning the hands, and the applications should be changed every three to five minutes, so as to maintain as high a temperature as the skin will bear without injury. The diet should be simple, bland, and unstimulating. Nothing can excell in value in these cases such foods as granola, taken in the form of mush, fruits--particularly strawberries, peaches, and grapes, and especially, if well stewed,-- granose, malted nuts, and other foods of like character.

The writer has seen many cases recover by the aid of the simple treatment outlined. In some cases the ice bag will be found necessary at the beginning of the disease.

Good Health editorial.

NEED NOT HAVE DIED.

The newspapers recently reported the death of Daniel L. Dowd, the famous New York gymnast, who for the last seven years has heroically fought against pulmonary tuberculosis or consumption, holding the disease at bay until within a few months by a persistent effort, building himself up to the proportions of an unusually strong and vigorous man.

Prof. Dowd was a champion heavy weight lifter, his private record being sixteen hundred pounds. He was able to lift himself up to an over-head bar by the little finger of one hand alone several times in succession.

Three years before his death Prof. Dowd became a vegetarian, a fact which doubtless aded him greatly in his fight against disease. That he finally succumbed was due to the unfavorable conditions of life which surrounded him. Instead of going to the mountain tops of Colorado, he sought shelter in a hospital in New York City, and searched in vain for relief through European travel. There is scarcely room to doubt that if this useful man had followed the advice of a famous Boston physician, whose universal prescription to his consumption patients was to "go a mile up in the air," he might at the present day be alive and enjoying excellent health.

Consumption is almost certain to be a vital disease in localities near the sea level, no matter how salubrious the climate may be in most particulars, nor how excellent other hygienic conditions may be. The dry, rareified air found at an altitude of about five thousand feet is certainly more serviceable in combating this disease than any other one condition, and if to this be added all the advantages to be derived from a well equipped sanitarium, such as is found in the Colorado Sanitarium at Boulder, the chances for life are increased many times. The writer believes it to be the duty of every person suffering from this disease

who can possible do so, to enjoy the wonderful opportunities for escaping the almost certain fate which lies before him by availing himself of the opportunity now afforded for the successful management of this disease.

Dr. Kellogg's Residence

Miss Fraser

Lectures to
Medical Students
on
Diseases
(7)

LECTURES TO MEDICAL STUDENTS.

Medical Dietetics.--Food --Source of Energy(Mar.14/98.)

J.H.Kellogg,M.D.

--- X ---

THERE is one principle which I think is fundamental and which we ought to consider very earnestly in connection with the subject of Food, and that is the fact that vegetable life is the divine means which God has devised for storing up energy. The sun is the source of energy in this world; sunlight is the beautiful vehicle by which God brings force down into this world. We cannot conceive of any kind of energy in this world which does not take its origin from the sun. Animals get their energy from plants; now where does the plant get its energy? From the sunlight which falls upon the leaves of the plant. If you plant a seed,--a potato,for instance--in the dark, it can grow only until the nourishment which it contains is exhausted,and then it ceases to grow,because it has no chlorophyll; chlorophyll is the active agent which utilizes the sunlight in building up the plant, just as pepsin, pancratin, saliva, etc.,build up the animal body.. The energies of the plant are brought together and held together by what we call vital energy. The sunlight shines upon the leaves ofplants and the leaves and bark of trees and penetrates to the roots, and under this stimulus the tree or plant stores up energy, and then it can be utilized by animals and men. We

can take a certain vegetable and put it in the stove and burn it, and it can be utilized in engines and running grist-mills or turning any kind of machinery,--we can burn it in the stove and keep our houses warm; heat is one form of energy. Natural gas comes from the coal-fields, and is of vegetable origin, by a decomposition of vegetable matter at some time --

Q. Does not the law of gravitation have something to do with it?

A. You must lift a thing up before it can come down. How does water get up onto the mountains? It is first evaporated by the sunlight. The sun heats part of the air and makes it lighter than the cold air and so it rises and the cold air rushes in to take its place, and thus the winds come from the sunshine.

Heat, light, electricity and magnetism are all immediately convertible; electricity is really light in another form. The sun makes the winds and the waves. The wind rustles the leaves and the friction of the leaves makes electricity in the air. The sun raises water in the clouds and the particles of water suspended in the air generate electricity; so through the action of the sun, and the movements of the clouds and the particles of water we have electricity generated,--but the sun is back of the whole thing. We can find no source of energy in this world except the sun. What a grand thought it is,--that all force comes down to us through the brilliant,glorious sunshine--that the ~~glorious~~ sun-

shine is the glorious channel in which all energy comes down to this earth.

Now God stores this golden sunshine in plants in various ways --for the purpose of utilizing energy. This brings us back at once to the fact that the taking of food is a divine ministration; it is the divine means by which the energy stored up in the plant is utilized in the body. The body, as has been well said, is simply a form through which a stream of matter flows,--"The animal body is simply a form through which a stream of matter flows." The body is not a fixed thing like a tree; the animal body is a ~~changeable thing and~~ changing thing. The tree is a fixed thing, still the tree is, to a certain extent, a form through which a stream of matter flows, because matter is brought up into the tree, the tree does its work in making fruit, then this matter is carried away and more matter comes up, so the trunk of the tree is certainly a form through which a stream of matter flows. Some parts of the body are more fixed than others,--for instance, the bones--but the body as a whole may be said to be simply a form through which a stream of matter flows.

When we speak of the form of the body through which this strea is flowing, we mean simply the shape,--the geometrical shape, if you please, the stream of matter which flows through it maintaining the activity of the body,--the life of the body. Now how

much matter goes through the body in a day ? Now the amount of food taken per diem is the rate at which the stream of matter flows through the body per day? Knowing this, we can tell how much would be required per hour. It has been ascertained that we require a half an ounce of water per day for each pound weight. Now how much solid food does a man weighing 150 pounds require daily,--how much so-called dry food which contains forty to fifty per cent.of water. This is a most interesting question?--do you know how this question has been settled heretofore? ("By feeding soldiers.") Yes,--and my voew is that the whole question has been settled wrong. In such countries as England,where they eat for the sake of enjoyment,it would be a good plan to make experiments and settle that question.. We have made such experiments here,--and what were they ? ("Ten of our class lived upon granose and fruit and fruit-juice--") It was mostly fruit-juice, and I think upon the average during the two weeks of the experiment,--Mr.--please tell us your experiment. ("About a year and a half ago ten of us lived upon granose and fruit and fruit-juice--it was mostly fruit-juice. I believe that during the two weeks the average was about a pound and a half a day. The first week we gained in flesh,and the second week we lost.") I think the amount ordinarily put down (23 ounces) is in excess for a daily allowance.

When the muscles are put to work hard there is a tremendous output of energy. You know the muscles burn up the food material

of the body. You know the amount of energy put forth by the muscles can be increased to such a degree that a man in an hour can do almost the total amount of work for an ordinary day. About how energy is put forth by the muscles every day by the ordinary laboring man,--how many foot-pounds ? About eighteen hundred thousand foot-pounds , or about nine hundred tons every twenty-four hours. The heart alone does about 124 foot-pounds of work in a day. Now this amount of force expended per day must be represented by food. Now suppose the amount of actual solid food taken per-diem is a pound and a quarter. Now we must have enough food to furnish that number of pounds' work must we not? This is the amount of work the man can do . About how much of the force of the body is utilized in work,--about how much is utilized as heat? ("Four-fifths.") Yes,--one-fifth in energy and the rest in heat. The human body is the most economical of machines,--for one-fifth of energy expended by the body in work, there is four times as much in heat,and five times the energy expended by the body in work would be the total output of the energy by the body in twenty-four hours according to that estimation. The estimate has been made that the body expends about 2700,000 calories but awe will not go into that at present. We must take food enough to support yhe work which is done by the body in heat - work and muscular work.

Now let us consider this for a moment,--let us see how much

food we would take in a whole year, supposing we use one and a quarter pounds of food a day. (blackboard calculation) 456 pounds in the course of a year,--nearly a quarter of a ton. Now if we add water to this food, as we usually take it, the amount would be a ton in the course of a year, but we ordinarily eat about a quarter of a ton of dry food. Now see how much we use in a month,- dividing by 12, we find it to be 38 pounds per month, about one quarter of ~~his~~ one's own weight; and including water we see that a person eats about his own weight every month. So the body changes about once every month, so far as bulk is concerned. But the blood does not change so rapidly as that,--how often does the blood change? ("In four to six weeks.") The brain changes pretty nearly as often, the soft parts changing more rapidly than the harder parts do.

Now this change takes place so rapidly, the body being a form through which a stream of matter flows, there must be a supply, and in order to do this, the first thing to consider is the rate of flow,--it is like a flowing tank--we want to know how much water will keep it at a certain level: if the water is flowing out at the rate of a cubic foot a minute, then it must flow in at the rate of a cubic foot a minute. It is important to regulate every animal body with the idea that it is a mahine,--a mechanism that works on the same principle as a locomotive, a steam-engine or a threshing-machine engine; that the amount of food we need

must be determined by the amount of work that is done,--and that is a very important principle--and just as soon as people begin to see and understand that, they begin to regulate their eating in accordance with rational principles; but so long as people eat for the pleasures of the table, and are thinking of what the bill of fare is to be at the next meal, the needs of the body will be neglected. But if we can induce people to look at the human body as a machine, as an energy-expending mechanism, then we can get people to base their dietary upon a rational basis . So it is important to place this principle before the people all we can. While I am giving you these principles I am thinking how you can help some one else with them and establish them in the right way. We are preparing ourselves to be missionaries to urge a propaganda in behalf of right living, --of living in accordance with the divine order.

The Lord has given us the vegetable as the means of storing up energy, and this energy we are to utilize.--Suppose I digress for a moment from our immediate subject and consider what we do when we take the flesh of an animal: In the first place we violate the divine order; the divine order was to store up energy in the vegetables and then let the animal take that energy and utilize that food,--can an animal produce food? ("No.") Can animals store up energy? ("No.") No,--not in the original sense; they cannot build up complex bodies out of simple elements, as vegetables do;

what do they do ? ("Tear down.") Yes, and the process of digestion is not a process which builds up very much. Now in the process of digestion there is an interesting point,--the change that takes place from albumen to peptone--the increase in the energy-containing qualities of peptone, that is, peptone of a higher number of food-units than albumen,--have you studied the food-units of food-elements? ("No.") How many food units are there represented as calories are there in a gram of dry fibrin? There are about 6200. You see there is a large amount of force stored up in a gram of dry vegetable fibrin. How much do you think it would be in animal fibrin ? It would be 400 less. That is an interesting fact; animal and vegetable fibrin are not the same; there is less energy in a gram of animal fibrin than in a gram of vegetable fibrin. Now when we convert that into peptone there is a falling off of several hundred more units. Why is that ? The process of peptonizing albumen is not a process of storing up energy in the molecule,--what are the processes of digestion in general ? ("Processes of hydration.") When we hydrate a thing what do we do to it ? ("Add water to it.") Suppose we add hydrogen and oxygen in the proportions whach are capable of forming water, (H_2O) to the albumen and then burn it,--can we get any energy out of the things we have added to it ? ("No.") Suppose we add oxygen,--does that increase or diminish the energy ~~diminishing~~

producing qualities of this molecule of albumen? (Diagram illustration.) Does it increase or diminish it? ("It increases it.") Yes, because the burning of the oxygen increases the energy. But we add an atom to the oxygen; we add H_2O--what is H_2O? ("Water.") Then we have burned hydrogen; if we add burned hydrogen to the albumen will that increase its force-producing value? ("No.") Not at all, you might as well add sand. So when we hydrate an element of food we don't increase its force-producing value--we don't build it up. Then the process of digestion does not increase the force-containing power of any of the food substances. Some of these food substances ,perhaps,in passing through the process of digestion ,are oxidized to some extent,and that may be the reason why the albumen digested in the form of peptone has less energy-producing power than the albumin we formerly had.

DR.PAULSON: The editor of the ... says that the vegetable molecule is so complex that it must be torn down by the animal before it can be utilized by the human body.

DR.KELLOGG: That is not true; he should furnish proof of that. Chemistry tells us that the animal and vegetable molecules are not essentially different; and no authority that I know of will undertake to maintain that the original elements are more difficult of digestion than the corresponding elements in an animal body,--there is no evidence that they are. We know that starch is

one of the most easily digestible of all the food-elements, and we know that vegetable fats do not become rancid so quickly as animal fats,--but we will take up this subject at another time.

We want to begin the study of foods and we want a foundation for that study. We must appreciate the value of food; the value of food is the amount of force which it contains.--

DR. PAULSON: So we are to eat for strength or force, and not for enjoyment.

DR. KELLOGG: Yes, we are to eat for strength, so we must know the strength ~~of food~~ value of food; so it becomees the duty of every man and woman to know the strength-producing value of food.

Then we must consider another point in reference to food,--and that is, its digestibility--because it might contain a great deal of energy and not be digestible; --for instance, sawdust has plenty of energy, but we cannot get it out by the process of digestion. There are plenty of rags which can be converted into sugar in a chemical laboratory, but not in the stomach. In Steele's Chemistry we read that Prof. Harper made 2 1/2 lbs of sugar out of his old woollen shirt,--but I suspect it was a cotton shirt instead of a woollen shirt,--you can't make sugar out of hair.. So we must consider the digestibility of food as well as its force-containing qualities.

In order to get at that , I will show you how to make a table of nutritive values from these little books; we will put

the table of digestibility on one side and the table of nutritive values on the other side. How will we find the force-value of food? We must know first the digestibility of the food-elements which the food contains; and then, secondly, we must know the force-value of each of these elements. I will give you a few points,--for instance, dry casein has a food-value of 58 (5800) food-units per gram. In vegetable fibrin we have 6200 (food-units per gram). Of animal fibrin, we have 58--just the same as casein. Of fat, we have 9700. Starch, 4500. Sugar, 4200--sugar varies slightly, 4100-4200. I give you round numbers so that you can easily memorize them. You will find elaborate tables in Landois and Stirling, and several other works. In beef suet (which perhaps is a fair representative of fat) we have 9700; Vegetable and animal fibrin are about the same.. Now, but for another fact, ~~if necessary,~~ we might average up the two, and call it 6000 food units per gram; authors differ two or three hundred units--so we might say, in general, that albumen and fibrin contained about 6000 food units per gram. But, is the albumen in the body all oxidized? ("No.") Do we get all the energy out of the albumen in the body? ("No.") In what form does the albumen leave the body? ("Urea.") And that also can be burned; so we don't get all the force out of the albumen, so that reduces the proportion of food units to about 5100 per gram,--so that in albumen we get only about 5100 food units per gram, whereas, in case of fat, sugar and starch, we get it all, as these elements are completely burned in

the body, or appear as CO_2 and water. But in the case of albumen we have a residue of urea left unburned, so that, as I have said, we have to deduct a portion of the food-units, and the authorities give us 5100 food-units as the actual nutritive value of albumen.

Having this nutritive table, we can make another table of the actual food-value of food-substances. We will select a few of the most important of these, for this purpose,--some of the most important of the food-substances: We will take Michigan white wheat (Diehl), barley, oats, corn (Dent), and rice,--it would be well to take also Graham flour, wheat flour, whole wheat bread, white bread, and white zwieback. Then take some of the fruits--the apple, the banana, the grape, the strawberry, the peach, and perhaps the cherry is one of the most nutritious of the fruits. It wouldbe a good thing to figure out nuts also. Then suppose we take the white cabbage (not the winter cabbage), the potato, the white turnep, the ordinary beet, the sweet potato, the cucumber, the cauliflower the asparagus, the onion and the tomato, in the line of vegetables. Then suppose we take green peas, garden peas, the small pea, field beans, kidney beans, white beans or Lima beans and lentils. Take also, cow's milk, salmon, the entire egg, pork and poultry. I think there is a mistake in the book herein reference to winter cabbage; the winter cabbage has a large amount of non-nitrogenous substances. This table is based upon the latest reports (it is from a German work in my library.)

Now suppose we take up our list beginning with Michigan Diehl wheat,—here are the albuminous elements; it might be well to put our results in pounds for convenience. How many grains in a pound ~~Wofrtepoiert~~ ~~sc 37000.~~ How many grains in a gram? (15.4. By dividing by 1954 we find that there are 454 grains in a pound. We could use this number, figuring the whole thing by grams, but it is a shorter method to get the proportion. It is well to reduce all these amounts and save complicated figuring. Take the 5100 which represents the albumen,--dividing by 15.4 we have 331 calories in a grain. For ~~sugarx~~ fat,--9700,--dividing this by 15.4 we have 630 per grain. Starch,--4500; dividing this by 15.4 we have ~~292~~ per grain. Sugar,--4200: dividing this by 15.4 we have 273 per grain. Here we have a table. We have 938 grains of albumen in a pount od Diehl wheat and multiplying by 331 we ascertain the number of food-units in a pound of albumen. For starch we have 4333 x 292. For fat we have 84 x 630--these are the three combustibles. By multiplying and adding what we have here we get the total value of the food. I will ask you to take the Michigan white wheat, as the fat is not given for the Diehl wheat.

It is more important to know the facts which you will get from this table and which you can carry with you in your mind than to carry the chemical formula. Here is a fund which you can draw upon for facts, and you should become familiar with these tables and know the proportions and food-values. Take these

[illegible]

For the Bulletin.

2/7/98

A PRACTICAL REASON FOR WITHHOLDING PRESCRIPTIONS OF ALCOHOL.

There are few physicians, even among those who believe in the therapeutic value of alcohol, who would not hesitate to make a prescription of wine, brandy, or any other alcoholic beverage, for a person who had once been addicted to the use of alcoholic liquors but who had been reformed. While this class of patients is a pretty large one, owing to the rapid increase of inebriety within the last quarter of a century, there is a very much larger class which consists of the children of men, sometimes also women, who have been regularly addicted to the use of alcoholic drinks, and who have received a hereditary bias toward inebriety. These persons do not, of course, inherit and appetite for alcohol, but they do receive by hereditary transmission a neurotic temperament which is one of the strongest of all predisposing causes of drug addiction of various sorts, the opium and cocaine habits as well as alcoholic stimulants. Such persons cannot make even the smallest use of alcohol without running an exceedingly great risk of becoming inebriates.

A few cases which have quite recently come under the writer's observation illustrate both the classes referred to. A man of about forty five years, who, after years of intemperance, had made a thorough reformation, who had for several months lived a sober, temperate life, and who had become established in a good position as a machinist, suffered an attack of acute dysentery. He applied to a druggist for relief, and received a dose of blackberry brandy. Immediately his old appetite was revived, and rushing to a saloon he entered upon a spree which lasted for several days before he could be again reclaimed.

Another gentleman, a lawyer, a man of culture and great ability, who after several years of degradation had been reclaimed, and for a number of

of years had led an entirely sober and temperate life, while riding on the cars was taken suddenly ill, and was given by a physician who happend to be present, a dost of something which contained alcohol in appreciable amount, with the result that the drink demon was so thoroughly aroused that as soon as the man reached his destination he started out in search of a saloon. Fortunately, no saloon was open at the time, and in despair he went to his hotel and shut himself up in his room, and put in twenty four hours engaged in a most terrific battle for supremacy over the old craving for alcoholic spirits, which came upon him instantly when the drug was administered.

A young man of fine abilities, who was at one time under the writer's care for the cure of inebriety, gave a history which plainly indicated the origin of his unfortunate habit. His father, a banker, a man of great intelligence and resolution, had made use of wine in moderate quantity all his life, and a bottle of wine was usually found upon the dinner table. The parents of the young man shared the idea that the moderate use of wine is a protection against intemperance from the use of stronger liquors. As the young man grew in years, his appetite for wine and alcoholics increased, until at the age of twenty he was a most confirmed inebriate, not possessing the power of self-control nor the vigor of constitution to endure the influence of alcohol, which his father appeared to be able to take in moderation with impunity.

The number of young men of this class at the present time living in our large cities must be exceedingly great. Fifty per cent. is probably not too high an estimate of the proportion of this class of persons susceptible to the influence of alcohol. A prescription of alcohol in any form as a tonic or a stomachic, or drugs containing alcohol, such as fluid extracts, etc., is exceedingly likely to prove in these cases the starting point of a life of inebriety and a premature death from Bright's disease, apoplexy, serosis of the liver, or some other disease resulting

from tissue degeneration.

In view of these facts, it is evidently the duty of physicians to carefully consider in every individual case whether or not the administration of alcohol may not be the means of untold mischief and injury.

Should we grant that some possible benefit might be derived from the use of alcohol in these cases, it is evident that the amount of damage likely to arise therefrom must much more than counterbalance any possible good. But when we consider the additional fact that alcohol has been clearly shown to be unnecessary, either as a food or as a medicine, it is evidently the duty of physicians to consider most carefully and conscientiously whether or not it would be wise to cease the prescription of this drug under any and all circumstances. That it is the duty of physicians to study this question with care is shown by a fact recently developed by a visit at a large penetentiary in Canada. In answer to an inquiry as to the probable number of persons who were committed to the prison in consequence of the use of alcoholic liquors, the warden made a careful examination of the records, and reported that of the 804 prisoners, 716, or 89%, were certainly assisted to their unfortunate position by the influence of alcohol, since, according to the record, the crimes of which they had been convicted were committed under the influence of liquor.

For Good Health. 2/2/98

THE NATURE OF THE DRINK HABIT.

Apropos of the numerous cures for intemperance with which the country at the present time fairly swarms, we call attention to an excellent article in the July (1897) number of the Journal of the American Public Health Association, by Dr. A. N. Bell, of New York, in which a number of cases and experiences are cited to demonstrate that inebriety is a vice rather than a disease. It is, of course, admitted that the vice of drunkenness, if maintained for a sufficient length of time, results in disease, or rather in diseases, numerous and grave in character.

In the writer's opinion it is highly important that the popular notion that inebriety is a disease, sometimes heridetary, sometimes the natural result of diseased conditions which create a craving for stimulants, is true only in a secondary sense, that the disease is directly due to voluntary vicious habits.

2/2/99

For the Medical Temperance Bulletin.

NEW EXPERIMENTS RESPECTING THE EFFECT OF ALCOHOL UPON THE MUSCLES.

Professor Hermann Frey has recently taken up in a new way the study of the influence of alcohol upon the nervesupplies of the muscles and upon muscular work. He employed as a means of determining the effect produced by alcohol an instrument known as Mosso's ergograph, by which it is possible to determine with absolute accuracy the amount of the work accomplished in a given time by the flexor muscles acting upon the middle digit of the hand.until the muscle is completely exhausted.

The author was led to begin his investigations by an interesting observation made upon a ~~xxxxxxxxxxxxxxxx~~ workman suffering from traumatic hysteria, after which he extended his observations to a number of other individuals, both healthy and diseased. According to the report of his observations, Professor Frey noted a difference in the effect of alcohol according as the muscle was fresh or exhausted. In case of the non-fatigued muscle, he found in every case that the effect of alcohol was injurious. Even beer and very dilute solutions of alcohol were found to diminish the height to which the lifted weight could be raised. In the majority of persons the amount of work which the muscle was able to do in a given time was decreased. A fact noted as remarkable was that notwithstanding the actual diminution in the amount of work performed, the person experimented upon was under the impression that the weight lifted was lighter, and that the work was more easily accomplished.

This fact shows clearly the subtle deceptive power of alcohol. One of its most marked effects is the benumbing or paralyzing of those delicate sensibilities whereby the body is warned of danger. The cold man under the influence of alcohol has no impression of cold, but feels warm, although he is really colder than before. The weary man feels rested, although there has been no change in the condition of the muscles

or nerves, and no opportunity for recuperation. It was also observed that when alcohol was given to a person whose muscles had been greatly fatigued by work, although the sense of fatigue was greatly diminished, the permanancy of fatigue was much greater,-- that is, the restoration to the muscle of its ability to work took place much more slowly when work had been performed under the influence of alcohol.

Dr. Frey does not consider the influence of alcohol upon the fatigue muscle any evidence that it is a food.

For the above interesting facts we are indebted to the Deutsche Med. Woch.

Following Pages
Are Best
Copies Available

REPORT OF THE SOUTH ISLAND BRANCH SANITARIUM.

Aug. 31, 1898.

Dear Fellow-laborers:-

As we have been encouraged by the reports received from the Missionary Committee from time to time, we have thought a brief report of the work here might be helpful to some.

In a general way, the work is conducted as nearly as possible on the plan of the parent institition with some necessary modifications in the program. There is morning worship for the family at 6:45 and for the patients at 7:45 daily. On Mondays and Thursdays we have noon-day meetings for the family. On Friday evenings a Bible study is conducted for all, and on Sabbath we have Sabbath School in the morning and a study of the principles in the afternoon from the Testimonies and the Bible. The meetings are all held in the parlor and open to all who wish to attend, and the majority of those in the house seem interested in the religious features of the work here. One lady came to us this week, who has spend several months at the Sanitarium in Battle Creek, saying she came principally for the spiritual uplifting which she felt she needed and which she felt she could find here if she found the same sort of people that she did there. To her surprise, she found one of the same nurses who had been helpful to her there. A month ago, a lady was herewith her husband, and after their return home, he was taken very ill with typhoid fever. She showed her confidence in the religion which we profess, by writing and asking for the prayers of the workers here for her husband. They are both Christians.

Another patient, a young gentleman, left us a few weeks ago, keeping the Sabbath and fully determined to do so after his return if it meant the giving up of his position as it probably would. He said he believed the Lord brought him here. Before he went, he spent sometime in canvassing for Good Health and probably quite a number will be at the school of health as a result of his labors. He is a bright, intelligent young man and capable of doing much good.

Another, on leaving, wished to know what steps would be necessary for him to take to join the S. D. A. church. He had fully determined to be a Christian. He is a landscape painter of some renown and expects to go to the Sanitarium at B. C. soon. Another interesting case

is that of a boy only fifteen years old who has been spending the summer here with his parents. He commenced keeping the Sabbath three weeks ago, and seems very firm in spite of the opposition received from the rest of the family. He attends all religious services regularly, and refuses to join the family on pleasure trips on the Sabbath. He says he will stick to it when he gets home and manifests a determination which will be helpful to him. They are people of wealth and influence and are in harmony with our health principles. Another young man left us recently who was almost persuaded and was still studying with unprejudiced mind.

With very few exceptions, the patients appreciate the religious features of the work and tell us they feel at home when they awake in the morning and the first sound that greets their ears is some familiar Gospel song. We realize every day, that our strength is in our Christianity and that the work is the Lord's and that He is carrying it forward and blessing it with a reasonable degree of success. Many good friends of the Sanitarium find their way to us here and often speak of the spiritual help received at Battle Creek. It makes us realize, more than ever, the power and influence there is in a cheerful face and a consistent Christian life.

We have at the present time about forty guests in the house, some of whom, wish to remain as long as we are able to continue the work here. The usual feeling when patients leave us is that they have been benefited by their stay and have learned how to better care for themselves after going home. We are of good courage in the work.

Yours very truly,

Mary B. Nicola.

Dec. 1898

THE NEBRASKA SANITARIUM.

The work has had a gradual growth from the beginning. It was not long before it became necessary to enlarge the building, which was done in 1895, affording more commodious office rooms and several more rooms for patients. As this was soon insufficient to accomodate the increasing patronage, it was decided to devote to Sanitarium work one half of the large brick dormitory belonging to the College, which was situated conveniently for that purpose, and was sufficient for our needs for some time. It soon appeared that the kitchen and dining room, also our bath apartments, were much too small for the increasing demands upon them. So early in the spring of 1898 the large kitchen, dining room, store rooms, etc., in the basement of that part of the College building already occupied by our work were brought into requisition, and once more we felt the satisfaction of more ample breathing room. The large kitchen in the main building was added to the ladies' bath room, while the abandoned dining room was partitioned so as to serve the purpose of a ladies' waiting room and a business office.

As the work has steadily increased, becoming more widely known in the city and elsewhere, it has seemed necessary for its proper advancement that a sort of head quarters be established in the city of Lincoln. In harmony with this idea an office and treatment rooms have recently been opened in the business center of the city, on the corner of 13th and P Sts. The electric light bath, spray and massage are given special attention. This office is so located as to be accessible to those whose home cares and business interests prevent their visiting the Sanitarium in the suburb for treatment. This latest addition to the work, together with the Sanitarium exhibit at the Trans-Mississippi Exposition at Omaha, has made the past season a busy one.

There have been received and treatment in the institution during the past six months, 250 patients. From time to time changes have taken

place among our helpers.

A nurses' training school is now in full operation in connection with our work here, so that we shall soon be able to supply experienced nurses from our own institution.

In October of 1897 Dr. Lou S. Cleveland connected with the Neb. Sanitarium. In the Spring of 1898 Dr. W. S. Butterbaugh was sent to assist in the work. He was soon called away to the Colorado Sanitarium, and Dr. D. W. Reed and his wife, Dr. Eva Reed, were sent to take his place.

Charity treatments have been given which at the regular rates would amount to $4,630.00, twenty-five gratis major surgical operations have been performed, and a great many free visits have been made which have not been recorded. This in the three and one half years during which the institution has been in active operation.

The spiritual interests of the work here have received careful tought and consideration during its entire history, as the workers have realized that in this the success of the work largely depends. Some of the patients have been, as we believe, truly converted, while others have been led to enjoy a deeper Christian experience. The noon-day prayer meetings and Bible studies are well attended by the helpers, where the subjects of Christian Help work and personal work are largely dwelt upon.

R.T.11-30, 1898

THE ELECTRIC LIGHT OR RADIANT HEAT BATH. In 1891 the author's attention was called by a colleague to the convenience of the ordinary incandescent electric lamp wrapped in flannel as a means of applying heat in cases of severe pain. I immediately began experiments with various kinds of apparatus designed to make therapeutic application of the incandescent electric light, which resulted in the development of the electric light cabinet and various other devices for the local and general application of heat by means of the electric light.

In the following paragraphs descriptive of the electric light bath and its effects, the author has drawn largely upon papers presented by him before the American Electrotherapeutic Association at its annual meeting in New York City October 25-7, 1894, and other papers read before this Association and other bodies of medical men.

Considering the manifold uses to which the electric light has been put, and especially in view of the fact that it was early employed in photography, it is indeed surprising that its value for therapeutic purposes should have remained so long unknown, for it is scarcely half a dozen years since attention was first directed to the high value of this therapeutic agent.

From a physical standpoint, light and heat seem to be nearly, if not quite, synonymous terms. The physicist tells us that the phenomenon of light is the result of certain rythmical disturbances of the universal ether, the pulsations of which are, in some sense, analagous to those of air which produce the phenomenon of sound. The whole gamut of these disturbances, which are recognized as heat and light, comprises, we are told about four octaves, one only of which produces so-called luminous waves, there being two octaves below and one above which give rise to the impression which we call heat. The skin seems to have a greater range of sensibility in this regard than the eye, a fact which

we need not consider remarkable, since the eye is only a highly differentiated and specialized portion of the skin. The thermic function of the skin is, when understood, certainly as remarkable, and presents as many problems, which are not easily explicible, as does the eye.

Radiant energy is concerted into heat only when it meets with resistance. The skin is translucent, almost transparent, when in a thoroughly healthy condition. The rays of radiant energy which we call heat or light, passing through the skin, meet with obstruction in the deeper tissues, and are there converted into heat. Hence, the therapeutic effects of the electric light are practically those of heat.

<u>Description:</u> The Electric Light Bath is employed in a variety of forms, some of which are general, receiving all the body, others restricted or local. The author has had constructed many different kinds of cabinets and special apparatus. Of the cabinet there are two generic forms. In one of these (Fig. .....), the patient sits upright with the head exposed to the heated rays or excluded from the bath as may be desired. In the other (Fig. .....), the patient lies horizontally upon a glass-top table. In this form also the head may be excluded or not as may be desired. I have also made extensive use of the bath in various limited forms, some of which are shown on the accompanying figures. One of the most serviceable of these is an arrangement for applying the light to the trunk with the patient in a sitting position. I find this to be especially valuable in cases of disorders of the liver, kidneys, stomach, and bowels. Applied in this way the application is usually followed by a cold trunk pack or a cold spray douche to the surface which has been exposed to the heat.

In all these forms of baths the heat is under perfect controll by means of switches which regulate the number of lights in use at any moment The cabinet is not closed, but is freely opened, so that the patient can breathe pure air at all times, and air at a temperature not much above that of the room in which the bath is given. In the administration of the bath it must be remembered tht the effects cited are not obtained by means of heated air, but by exposing the body to rays of radiant energy, which emanate from the incandescent film of the electric light. These rays readily pass through not only glass and air, but also through the patient's skin, the skin being, if not transparent, at least translucent. The length of time of the bath depends upon the effect desired. This bth is usually followed by a shampoo, a cold ~~xxxx~~ shower, the finishing treatment being essentially the same as for the Turkish and Russian baths.

<u>Physiological Effects.</u> A study of the influence of the electric light upon living forms has been prosecuted by numerous observers, especially since the interesting paper by William Siemanns in 1880, in which the following conclusions were drawn:

1. That the electric light is efficacious in producing chlorophyl in the leaves of plants, and in promoting growth.

2. That an electric center of light, equal to 1400 candles, placed at a distance of two metres from growing plants, appeared to be e qual in effect to average daylight at this season of the year (March), but that more economical effects can be obtained by more powerful light centers.

3. That the carbonic acid and nitrogenous compounds generated in diminutive quantities in the electric arc, produce no sensible deleterious effects upon plants enclosed in the same space.

4. That plants do not appear to require a period of rest during the twenty-four hours of the day, but make increased and vigorous progress if subjected during the daytime to sunlight and during the night to electric light.

5. That the radiation of heat from powerful electric arcs can be made available to counteract the effect of night frosts, and is likely to promote the setting and ripening of fruit in the open air.

6. That while under the influence of electric light, plants can sustain increased stove heat without collapsing, a circumstance favorable to forcing by electric light.

Similar experiments have been made by others. The first to make experiments was Hervé -Mangon (Compt. Rend. 53, 243). These experiments showed that the electric light was capable of causing the development of chlorophyl and inducing heliotropism, or the phenomenon of turning or bending toward the light.

Prillieux (Compt. Rend.69,410) showed in 1869 that the electric light is capable of promoting assimilation in plants, or decomposition of carbon dioxide and water.

Siemens found that plants exposed to ordinary daylight and six hours of electric light in addition "far surpassed the others in darkness of green and vigorous appearance generally." Strawberries and other fruits were fully equal to those raised under ordinary conditions, and grapes were of stronger flavor than usual. Melons were remarkably large and aromatic, and bananas were pronounced by excellent judges to be "unsurpassed in flavor."

Many of these experiments have been repeated in this country and with similar results. The most important experiment

were those conducted at the Cornell University Agricultural Station in 1889-90. These results show clearly--

1. That the electric light may be used under such conditions as to make it fairly comparable to sunlight in its power to promote protoplasmic activity.

2. That the electric light acts as a tonic to plants so that they are able to endure adverse conditions which otherwise would cause th to collapse.

3. That the electric light is a true vital stimulus, since the effect of its use at night, upon plants, is essentially the same as that of the larger day of the Arctics upon plants growing in that region.

Another fact of importance which has sometimes been observed, was the deliterious influence of powerful arc lights upon workmen engaged in close proximity to them, effects analogous to those of sunstroke.

Although not fully acquainted with the facts above referred to when I first began the use of the electric light bath, I had seen brief notices of these experiments, and thereby became interested in the subject from a therapeutic standpoint. For more than twenty years I have made use of the sun-bath as a therapeutic means, and many years ag experimented with large convex lenses for the purpose of concentrating the sunlight, and thus intendifying its effects in the treatment of neuralgia, and spinal and other hyperesthesias. I found good results from its use employed in this way , but did not complete my observations, on account of the great amount of time required and the uncertainty of having sunlight at the time desired.

In experiments conducted by myself by the aid of Drs. Paulson and Rand, and Prof. Gunberg, of the University of Michigan, who superintended the chemical work for me, I have succeeded in demonstrating several very useful and interesting facts respecting the physiological effects of the electric light bath. I ascertained for example that the electric light bath is without doubt the most efficient and satisfactory of all modes of inducing perspiration, for it produces the most powerful stimulation of the perspiratory glands and othr structures of the skin. In the electric light bath, perspiration appears in a remarkably short space of time, thus not necessitatinf the exposure of the body to the exhausting effect of prolonged exposure to heat. Profuse perspiration generally appears in the electric light bath in three to five minutes, and often when the temperature of the air surrounding the patient is not above 85° F., while the dry pack not infrequently fails to produce vigorous activity of the skin within less than an hour and a half or two hours, a longer time being som times requires.

It was also ascertained that the lings throw off, while exposed to the incandescent light, a decidedly larger proportion of carbonic acid gas. The peculiar value of the electric light bath I consider due to its efficiency as a source of radiant energy. In the Turkish bath, heat is communicated to the body chiefly by the convection of heat and air. Air, being a poor conductor xxxxxxx communicates heat to the body very slowly. Absorption of heat is further hindered by the skin, an excellent non-conductor, and by the rapid evaporation of moisture upon the skin, whereby it is cooled so rapidly that it is possible for a man to enter and remain for a considerable time in an atmosphere far above the boiling point. I have several times been in a Turkish bath at 300 degrees, and suffered no inconvenience. The heat is detived

from the electric light, however, by radiation, and not by convection. The skin, as well as the air, is to a large extent transparent to radiant heat,, and the same is true of all the living tissues. This is evidenced by the phenomenon of transillumination. By a speculum placed in the vagina or rectum and a suitably arranged electric light of 16 or 32 candle placed over the abdomen, I have seen the whole interior of the trunk illuminated and made to glow with a bright red light, the red color being due to reflection from the red corpuscles of the blood. Even the bones are transparent to light when in a living state. This is clearly shown kk by placing the hand between an electric light and the eye, with the fingers in close contact; the hand being placed near enough to the light the whole fingers will be seen to be illuminated by the light, and not simply the soft parts.

It may thus be said that heat from the electric light penetrates the body just as it would penetrate any other transparent or semi-transparent medium, while the heat of the Turkish, vapor, or Russian bath, is communicated to the body by convection, and slowly works its way into the body by heating the successive layers of living tissue which, although like glass, transparent to radiant energy, also possess to a greater or less degree the non-conducting powers of glass and allied substances. It is true that non-luminous as well as luminous heat waves are thrown off by heated bodies, the whole gamut of radiant radiant energy in the form of heat being stated to consist of fully four octaves, more than two of which are below the red, while a whole octave is above the violet, the luminous range occupying a space only a trifle greater than what would correspond to the chord of the sixth in music. But the lower octaves of the heat waves

seem to be far less active than those included within the luminous area and above it. I do not consider that there is any specific effect obtainable from the electric light which would not be derived from any equally efficient source of radiant heat, and on this account I have preferred the term, the radiant heat bath rather than the electric light bath, as the former term leaves room for the employment of any luminous source of heat which may possess properties identical with those of the electric light.

Therapeutic Applications. I have found the electric light bath of far greater value in the treatment of a great variety of maladies than any other means of applying heat, except water, and find that it may be much more generally employed than the ordinary Turkish, Russian, vapor, or hot-air baths. One reason of this is the convenience and rapidity with which the degree of heat may be graduated by turning on or off one or more groups of lamps, by which means the amount of heat is rendered absolutely and instantly controllable. The source of heat relied upon is the incandescent filaments of the lamps rather than upon a heated atmosphere, and hence is easily or instantly controllable.

The instant the lamp is turned off, the heat which had previously emitted is withdrawn from operation. If additional heat is required, the desired number of lamps may be turned on and become instantly operative.

Another reason for the more universal application of the incandescent light bath is the fact that when properly applied, its effect are highly tonic in character. A short application of the bath at full force for a time just sufficient to induce powerful stimulation of the skin without provoking perspiration, is one of the most effective

means of peripheral stimulation with which I am acquainted. The tonic effects of such an application may be still further intensified by instantly following the bath with a cold spray or other cold application, thus producing a revulsive effect of the most agreeable and effective character. The excessive heating of the skin prepares the way for a cold application, without at the same time so overheating and relaxing the bloodvessels as to render recovery of the tone of the cutaneous tissues so tardy as to involve the risk of exhausting the patient too greatly or exposing him to the liability of taking cold.

In the experiments referred to the amount of perspiration produced in the electric light bath was found to be double that produced in the Turkish bath. The bodily temperature is raised much more rapidly in the electric light bath than in any other forms of bath because the rays of radiant energy pass through the skin and reach the interior of the body at once. The electric light bath is especially valuable in ..... and in diabetes in which prolonged sweating measures generally cannot be employed without more or less risk. The penetrating nature of the heat of the electric light bath stimulates oxidation of the residual tissues and thus hastens the disappearance of the redundant fat. In dropsy, without heart, cardiac or Bright's disease, in the toxaemia of chronic dyspepsia, and in all conditions for which general and local applications of heat are applicable, the electric light bath stands preeminent.

In rheumatics and in anemic patients, persons whose heat-making capacity is small the electric light bath serves an exceedingly useful purpose in preparing the skin by storing up in it supplies of heat, so as to prepare it for a cold application, and it serves a useful purpose in this way, not only in preparing the patient for tonic

applications of water, but as means of producing most excellent revulsive effects. For pure revulsive effect, one desires only circulatory reaction. It is, in fact, necessary to suppress thermic reaction altogether; hence cold applications which follow hot applications should be only of such length as to neutralize the heat which has been absorbed by the skin in the previous hot application. The electric light bath having the power to store up quickly a large amount of heat in the skin, it is consequently of special service in applications of this kind, which are the most effective means of relieving internal congestions, and the most powerful of all external agents for the relief of pain.

A local application of the electric light for three or four minutes, followed by an application of an ice compress for fifteen seconds, is almost an paracea for the pain of sciatica and for other similar painful affections in which there is no inflammatory action.

For general revulsive effects, I have devised a new form of bath, which combines the shower and douche with the electric light bath. The cabinet is made of such shape that the patient stands in an upright position. After the skin has become thoroughly warmed by the heat from the lamps, a cold shower or horizontal jet douche, of the desired temperature, is applied, the lamps being protected from the cold water by an internal lining of plate glass. The revulsion thus produced is of the most powerful character, and can be repeated as many times as required. By making the hot and the cold applications of equal length, this bath can be made more exciting than any other therapeutic application can be made, and thus the most powerful tonic effects can be produced.

By combining the electric light bath and the cold douche, cold compress, rubbing with ice, or any similar cold application, the most powerful, alterative and resolvent effects may be produced. I have found this measure to be of immense value in the treatment of

chronic arthritis, especially when accompanied by exudates.

The author is glad to be able to note tht the electric light bath was warmly received in Germany and Austria has been so rapidly introduced It has the endorsement of the most eminent hydrotherapists and therapeutists in both Germany and Austria, and numerous establishments have been founded in which this bath is the principal measure employed. Dr. Winternitz, Professor of Hydrotherapy and Dietetics in the Imperial and Royal University at Vienna, after summarizing the physiological effects of the bth to which the author called attention in his paper upon the subject, adds the following points of interest: "The quantity of perspiration in the electric light bath is considerably larger than in the vapor bath. That radiant heat here plays the most important part, and not the temperature of the air in the cabinet, is demonstrated by the fact that the external surface of the thighs, which were directly exposed to the light, perspired much more rapidly and profusely than the inner surfaces, which received only reflected rays. Within ten to thirty mintues the body temperature reached 39 to 40° C., (102° to 104° F.) Pulse 100 to 160, respiration 42, with symptoms of a fever-like condition I have employed the electric light bath, heretofore, like the vapor bath, only in a few disorders such as chlorosis, chronic rheumatism, and gout, and have obtained satisfactory results. Kellogg reports regarding very favoravle results of treatment of xxh chlorosis, gout, and a number of cases in which there is increased metabolism; Lahman reports regarding psoriasis. As we now possess a thermic method in which the electric light bath by means of which we are able to measure the exact dose, and knowing the powerful influence on cell life and the entire organism, we believe this method of thermic application should receive an important place. It enables us to influence a nume

ber o maladies much more rapidly, better and more intensely than we have heretofore bee able to do."

610.84

Add to Electric Light Bath.

The electric light bath enjoys the advantage over every other means of applying heat in the readiness with which the dosage may be regulated as regards time and intensity. The instant the button closing the circuit is turned the whole force of the bath or that portion of it in use is brought to bear at once upon the body. The instant the button is again turned, opening the circuit, the heat is wholly and absolutely withdrawn. By means of properly adjusted switches whereby the number of lamps in use may be controlled, the amount of heat applied may be exactly regulated.

Another advantage of the electric light bath is that it does not interfere with heat elimination; it in fact encourages heat elimination by exciting freeperspiration. Many other forms of hot application, particularly hot water baths, cause perspiration by the retention of the bodily heat. In the electric light bath heat elimination and the excretions of effete matters which accompanies vigorou sperspiration proceed inthe usual manner while at the same time the rays of radiant heat are penetrating the tissues, elevating the temperature of the blood, and quickening all the vital processes.

Note. Electric light bath.)

Recent physiological experiments have shown that the elevated temperature of the febrile condition is one of the methods by which nature combats the causes of disease or neutralizes some of the conditions resulting from disease. The physiological effects of the electric light bath might exercise in many cases a strongly curative influence by the elevation of the bodily temperature. This is a subject which needs further elucidation.

Jour. A. M. A. Oct. 26, 1901.P. 1148.

Deutsche Med. Wochenschrift, Oct. 3.

ELECTRIC LIGHT SWEAT BATHS.

Krebs.--As the results of experiences and observations at the hydrotherapeutic institution connected with the University of Berlin, Krebs announces that incandescent light baths induce profuse sweating more rapidly and at a lower temperature than is required for hot-air baths. This effect is probably due to the heat rays in these lights. The arc light is much less effective. Patients with organic heart defects may find these baths injurious.

The Medical Times.

COLORED RAYS OF LIGHT IN THE TREATMENT OF TUBERCULOSIS.

By Dr. J. Mount Bleyer, F.R.A.M.S., LL.D., of N.Y. City.

Friction even of two dried pieces of wood excites combustion by the ecolution of hydrogen gas which bursts into flame when brought into contact with the opposidte electricity--evolved by the heat.

Light is inimical to, and under favorable conditions may wholly prevent, the development of organism. The action of light entirely destroys the bacteria, or reduces them to a condition of torpidity, which requires months of darkness in favorable surroundings for them to overcome. In my experiments which were made I took small test tubes containing cultivation fluid, which were suspended in deep, narrow boxes made of garnet, red, yellow, blue and ordinary glass, respectively. Although the blue and yellow glasses were not monochromatic, the results showed that the action is chiefly dependent on the blue and the violet rays.

Light acts as a stimulus to animal and plant protoplasm. It induces characteristic changes of form in individual cells, and causes movements in fixed directions in free-living unicellular organisms.

I have discovered by experiment and practice the special and specific efficacy in the use of the combination of the caloric rays of the sun, and the electric arc light in stimulating the glands and cells of the body, the nervous system generally, and the secretive organs of man and animals. It, therefore, becomes a most important adjunct element in the treatment of acute and chronic diseases, especially such as have become chronic, or result from derangement of secretive, perspiratory or glandular functions, as it vitalizes and gives renewed activity and force to the vital currents that keep the health unimpaired, or restore them when disordered or deranged. My entire early experience in this line of work was founded on patient experiments upon young and old animals of several kinds. Since the last five years I employed these different rays of light in the treatment of many forms of tuberculosis and various other forms of diseases. I came to the conclusion that light is one of the most marvellous therapeutic agents yet

employed to combat tuberculous conditions. Many experiments could be brought forward to show you how its effects are made visible by comparison, but suffice it to say, that trials by others will prove my work; that it stands upon its own merits.

All these important and pointed phenomena of violet and blue rays led me to test their efficacy upon the human organism for different ailments as I say, and I found that exposure to the rays for an hour or two daily, in all forms of tuberculosis and other forms of lung diseases, gave excellent in nervous exhaustion produced from worry, overwork, in weaklings, senile decay, and a host of other diseases, gave excellent account of themselves. A number of experiments were carried out in acute infectious diseases, gave as in scarlatina, diphtheria, etc., to the power of this light may be credit ded also much therapeutic value.

I have found the best results were gotten from the violet rays, as generated by colored glass and concentrated sunlight by means of lenses, or as passed through colored glass alone, or colored fluid media, produced during the period of the season in this latitude when the sun's rays were strongest, as during May, June, July, August, September and October. Though, nevertheless, some of my experiments on animals for comparison have shown that the influence of the violet rays were very marked, even whe when the declination of the sun was such, during aperiod of comparative feebleness of the force fo the actinic or chemical rays. This time was especially selected for experiment for that very reason. It is almost immaterial whether strong electric light is employed or the solar light . Of course, one can always depend on electricity al all hours of the day and season, and so be independent as to its regular employment. We know positively that electric light has similar chemical properties to sunlight; it effects the combination of chlorine and hydrogen, acts chemically on choride of silver, and can be applied in photography.

I am of the positive belief, from my acquired practical and theoretical knowledge of facts, that the best method to treat tuberculosis and other forms of lung disease is in specially designed solariums at home or at a sanitarium where violet lights can be generated, according to the requirements of each individual case and specially treated upon principles according to the condition of each case.

The Lancet.

THE "LIGHT TREATMENT."

Mr. Morris does not appear to accept the theory that the chemical rays act in a remedial manner entirely by their bactericidal power, but space does not permit of discussing this point. The curative agency of these chemical rays does not seem to be confined to lupus vulgaris, for Mr. Morris showed a case of lupus erythematosus in which great improvement had resulted, and he also exhibited a typical case of redent ulcer in which the hardness had disappeared, leaving only a superficial healing ulcer.

The Lancet.P. 286. July, 28, 1900.

THE LIGHT TREATMENT AT THE LONDON HOSPITAL.

More than three years have now elapsed since Finsen of Copenhagen introduced to the profession his method of treating lupus by means of light, and the favourable evidence obtained at his clinic is amply sufficient to justify a more extended employment of this valuable agent in the treatment of this troublesome disease. Although Professor Finsen has used his method for three years, yet it is only a little more than six weeks since any public institution in this country has been in a position to employ this therapeutic aid. The London Hospital is the pioneer in this matter, and this is due partly to the gift to the Hospital by the Princess of Wales of some fo the apparatus needed for its working and partly to the praiseworthy energy og the authorities of the London Hospital who have done all that can be required for the efficient working of the method. The "light cure" is carried on under the superintendence of Dr. Stephen Mackenzie and more immediately under the direction of Dr. J. H. Sequeira who attends for several hours daily for that purpose. A fair-sized ward has been set apart for the treatment and it includes dressing-rooms for the patients. The apparatus consists of an arc light surrounded by a shade so as to prevent the eyes of those present being dazzled. From this light there radiate four or more telescopes, each telescope conveying the light to one patient. The telescope contains lenses composed of quartz which has less obstructive effect on the active rays than any other refractive medium. The space between two of the constituent lenses of the telescope is filled with distilled water to moderate the temperature and an enclosing water-jacket serves still more to abstract the heat. The lenses are so arranged as to render convergent the divergent rays proceeding from the arc light, and they are brought to a focus by another lens which is held in position by a nurse. This lens is composed of two plates, which may be of quartz or even of glass, and the space between them is filled with water and may be connected with a supply so that there is a continuous reppacing of the water which may have

become heated by water which is cold. This cooling lens is held by the nurse and pressed by her fairly firmly on to the affected part. The object of this pressure is to render anaemic the part to be treated, as it has been found by experience that the therapeutic effect is much greater if the tissues are bloodless than if the circulationin them is proceeding normally. The active rays seem to be those which are usually called actinic, and are ultra-violet in the spectrum; they are therefore the most refractive rays, and they are accurately focussed on the part, the pressure being so adjusted that a red halo is seen surrounding a colourless centre of a little less than a shilling in size. The lens pressing on the skin may be held in position by rubber bands, but it is thus liable to shift and the employment of an intelligent nurse gives much more satisfactory results. It is, however, necessary that the nurse's eyes should be protected by coloured spectacles, as the light reflected from the lens pressed on the skin is intensely brilliant. Whenever it is necessary to readjust the position of the patient a red cloth cap is placed over the lower end of the telescope. The patient lies on a raised table or is seated in an adjustable chair the position of which can be varied so that the rays of light shall fall perpendicularly on to the skin. Each application or seance lasts about an hour and as each patient is treated once a day and the department is open from 9 A.M. to 12:30 P.M. three sets of patients are under treatment every day, an interval of a few minutes being allowed between sittings. The nurses after a little practice do not find it at all tedious to keep the compressing lens in position, exerting pressure at the same time, even though it lasts three hours each day. Great care is taken against sepsis; in order to prevent any such accidnet a separte pressure lens is kept for each patient and also separate parts of any other portion of the apparatus which comes in contact with him. These are kept in a series of lockers inscribed with the patient's names. Care is taken to protect the eyes and the unaffected parts of the patients' skin from the effects of the light rays.

The light is provided by an arc light taking 60 to 80 ampore of current. This is obtained in the following way: the public electric amin is employed tbowwkkaacobnverter which increases theamperage of the current from 10 to 60 or 80, while reducing its voltage from 140 to 60. Tha present converter is quite capable of supplying two such arc lamps as that employed at present, so that the capacity of the department could be doubled if necessary.

The same treatment can be carried out by the employment of the direct rays of the sun, and a small portion of the grounds has been shut off by a high paling from which can be hung curtains so as to exclude the gaze of the curious. The parallel rays of the sun are focussed on to the part by a large hollow lens containing an ammoniacal solution of copper which absorbs a large proportion of the heat rays. A separate lens has to be employed for each patient and a pressure lens, like that used with the electric light, is held against the affected part. There is no essential difference in the results obtained by the two methods.

The effect on the patient is in no way painful; the application itself causes no discomfort, and in so far as it is felt at all it is said by the patients to give a sensation of gentle warmth, BUt a few hours after the first application there is a certain amount of "reaction": the part swells, becomes reddened, and is tender, but even then there is not real pain. This reaction varies in degree in different cases and is always seen in lupus vulagaris, but does not occur in cases of lupus erythematosus, so that it may be of some diagnostic value. As a rule it may be said that

the greater the reaction there is the better the result. The beneficial effect of the treatment is often manifested whithin a few days, and one or two cases have occurred in which recovery ensued after only a few applications Generally about 15 to 20 or 25 applications have to be employed before a satisfactory result is obtained. At one time an area not larger than the size of a shilling can be treated, so that if the diseased patches are extensive a prolonged course of treatment is required. The results, however,

are eminently satisfactory; the skin becomes smooth, soft, and pluable, and what scar there is attracts little notice. The cases that are the most suitable are those with small recent patches of disease, but extensive chronic cases are improved, though not so rapidly. Lupus vulgaris seems to be the only disease in which the results are marked; in lupus erthematosus there is a little beneficial action , and one case of this disease is now under treatment at the London Hospital. It is early yet to speak of the permanence of the result, but Professor Finsen finds that recurrence occurs in only a small proportion of the cases, and in those a little further treatment removes the recurrent in those a little further treatment removes the recurrent disease. When each patient is first admitted to this treatment at the London Hospital a photograph is taken, and we hope in a few months'time to show the results when sufficient interval has occured to render it probable that recovery is permanent. It is intended in a short time to provide an afternoon seance for paying patients if a sufficient number present themselves. Whatever may be the ultimate verdict of dermatologists on the Finsen treatment no one can deny the striking beneficial effects in lupus of this variety of phototherapy.

The British Medical Journal .

THE "LIGHT TREATMENT" AT THE LONDON HOSPITAL.

A Light Department for the treatment of lupus and other superficial local skin diseases that depend on bacterial influence has recently been organised at the London Hospital by Dr. Stephen Mackenzie. The methods and apparatus which he uses are almos identical with those of Professor Finsen of Copenhagen, which were lucidly described in the British Medical Journal of September 30th, 1899, by Dr. Valdemar Bie, of Professor Finsen's Medical Light Institut at Copenhagen.

It will be remembered that if a beam of white light is focussed on a thin glass bulb containing a simple mixture of chlorine and hydrogen gases, the element unite and the globe explodes with a loud report. If now the solar spectrum be used and the different rays be focusses on the globe, beginning at the red end, the red and yellow produce no effect, but the villet cause as before an explosion. Charcot, as long ago as 1859, expressed the opinion that sunburn or erythema solare was due to the ultra-violet chemical rays. It has been a matter oc constant observation among mountaineers that after a day on the snow-fields where there has been no excessive heat, but rather coldness, that severe sumptoms of sunburn were felt on the following morning, not limited to the bridge of the nose and those parts on which the direct rays of the sun can fall, but under the chin and on other parts more or less protected form them. Wildmark has advanced evidence that this erythema solare is due to the action of the ultra-violet rays, t and Finsen showed that this effect is shared, but in a less degree, by the other more refrangible rays of the spectrum, the visible violet and blue rays.

Godneff advanced a step further when he showed that these chemical rays can blacken silver chloride when placed in sealed glass tubes under the skin of animals, and Finsen demonstrated that this effect was more certain and greated quantitiatively when the intervening tissues were rendered approximately bloodless. This he did by placing ordinary silver chloride

photographic paper behind the lobe of an ear made comparatively anaemic by compression. Of couse it has been for long known that yellow and red solutions can obsorb the violet rays of the spectrum, and that if a thin layer of blood be examined with the spectroscope, the red end of the spectrum is visible alone, and so the observation that if the unaltered lobe of the ear be looked through with the spectroscope only a red band is seen, but if through the lobe emptied of blood all the clours are seen might have been anticipated.

The sunlight could kill microbes was first proved by Downes and Blunt, and this bactericidal power was shown to depend especially on the blue, violet, and ultra-violet rays. From the researches of Dr. Bie and others it is known that bright sunshine can kill the bacillus prodigiosus in thin plate culture in an hour and a-half, and that the light from an electric arc lamp of 25 amperes current can kill a similar plate culture at a distance of about Sainches (75c.m.) in eight or nine hours. But to produce a sufficiently vigorous effect of utilisable therapeutic value it is necessary to concentrate the bactericidal chemical light, used after the manner of Finsen, it was then discovered, would kill most pathogenic organisms, when growing on a thin film of agar, in a few seconds.

THE APPARATUS AND METHODS OF THE LIGHT TREATMENT.

The problem, therefore, is how to bring to bear on the microorganesms contained in the tissues of the skin a concentrated yet cool light, or more strictly the chemical rays of light, both visible and invisible, freed fron the heating and illumintaing rays. In Finsen's apparatus the power of water is utilised to absorb the ultra-red or most caloric rays, and that of blue substances dissolved in it to absorb many of the red and yellow rays In the case of the sunlight, a hollow planoconvex lens, 8 to 16 inches in dh diameter, containin g a bright blue ammoniacal solution of copper sulphate, es the essential part in achieving these objects. But the resulting light is still too warm for purposes of treatment, so a further cooling mechanism is requisite, and thisisiapplied in the course of the rays just before they

enter the skin. It is a hollow lens similar in shape to that just described, but only about an inch in diameter; it is provided with inflow and outflow tubes, through which cold water is kept constantly circulating; and that it may not only be used to cool the light and the skin, but also to exert pressure on the area of skin to be treated, and thus rende it approximately bloodless, it is provided with four metal arms detérgéng concentrated from the brass rim to which elastic bands may be attached, so that they can pass across the head or other part, and exert constant traction on the pressure lens. If from any reason the use of sunlight is impossible, then an electric arc lamp of 50 to 80 amperes-light-is-very-rich creenet (not an incandescent lamp) is used, as its light is very rich in chemical rays. It is necessary that the divergent rays from sych a lamp should first be rendered parallel before being converged, contentrated into a focus and cooled. Shortly described, the apparatus used is a telescope, the large end of which is place next the lamp, having lenses made of quartz or rock crystal which itself can absorb heat rays, and between tow such lenses a length fo tube filled with distilled water(copper sulphate solution is not now needed, seeing that the chemical rays are so plentiful) around which cold tap water is made to circulate, in a sort of water jacket, that absorbs still more of the clasric rays. The selection of the source of the chemical rays, whether lamp or sun, depends on the following considerations. The local effects of the light from the electric arc lamp have been found from experience to have, if anything, rather greatertherapeutic efficacy than the those from the sun, and at the same time the rays have much less heat effect But in summer when the sky is clear sunlight is preferred, partly because it is not costly, as the electric light certainly is, and partly on account of the beneficia l general effects of the openair during the lengthy seance, included in which is the psychical influence of the bright sunshine.

The light as it reaches the patient feels, we were told by some of the patients, just moderately warm. After the area fo skin selected for the day has received its hour's treatment, a dressing of zinc carbonare and lanolin is applied (but if suppuration should subsequently occur, as it very occasionally may, a boric ointment is used), and the patient is allowed to leave. There is at the time no redness, or swelling, or pain--in short, no heat effect; but from six to twelve hours later redness and swelling set in, but without pain, a reaction which is more marked in the skin of the younger patients. At the end of twenty-four hours the reaction is fully developed. Bullae often form, and there is usuallu some serous weeping; but there is rarely pustulation, and never necrosis of tissue. The antiseptic precautions which have been described are taken chiefly to avoid the occurrence of erysipelas.

The Lancet.

Malcolm (Copenhagen)

THE "LIGHT TREATMENT."

Mr. Morris does not appear to accept the theory that the chemical rays act in a remedial manner entirely by their bactericidal power, but space does not permit of discussing this point. The curative agency of these chemical rays does not seem to be confined to lupus vulgaris, for Mr. Morris showed a case of lupus erythematosus in which great improvement had resulted, and he also exhibited a typical case of rodent ulcer in which the hardness had disappeared, leaving only a superficial healing ulcer.

DR. S. SOLIS-COHEN

HOURS:
9 TO 10 A.M.
2.30 TO 4 P.M.
MONDAY AND THURSDAY EVENINGS, 7.30.

TELEPHONE 1-38-14.

1525 WALNUT STREET

104 Blvd St-Germain.
Paris France

PHILADELPHIA, Oct. 10, 1901. 190

Dr. J. H. Kellogg,

Battle Creek, Mich.

Dear Doctor Kellogg :-

I have your kind favor of October 8th, for which accept my thanks. The names of the books to which I have referred are as follows : "Lichttherapie", Prof. Dr. H. Rieder, in München. (Handbuch der Physikalischen Therapie. Dr. A. Goldscheider und Dr. Paul Jacob.) "Thermotherapie. A. Physiologisches" von Prof. Dr. A. Goldscheider, in Berlin; and "B. Technik und Anwendung der Thermotherapie", von Dr. R. Friedlaender, in Wiesbaden. From what you say I presume you have them, therefore I shall not send them to you unless you notify me to that effect.

Yours very truly,

S. S. Cohen

(Both in (Handbuch der Physikalischen Therapie. Dr. A. Goldscheider und Dr. Paul Jacob.)

Med. Record. Aug. 3, 1901.P.200.

INSECTS AND THE X-RAYS.--

A box was made half of wood and half of sheet lead. In the wooden half a number of larvae of flies, bees, beetles, and other insects was placed, and the box was then put in the field of the x-rays. The insect colony at once became greatly excited, and after crawling to and fro, finally emigrated , to a worm, to the leaden half of the box, where the rays could not penetrate. The experiment was repeated many times, and always with the same result. A similar experiment was tried with the blind larvae of a certain species of beetle. A number of them were placed in an open cigar-box, which also contained a metal box with an opening. No sooner were the rays turned on than the insects showed signs of distress. Their uneasiness increased, and in a little while they all sought refuge in the metal box. As the larvae in the second experiment were entirely sightless, their perception of the rays must take place through the nerves of the skin.-

The Amer. X-Ray Journal.

loveliness such as they had never seen before. A dim, pinky flush stole for the first time into his sallow cheeks, and something like a light of human passion came into his eyes.

Then he spoke. The words were slowly uttered, passionless, and very distinct. As words they were unintelligible but there was no mistaking their meaning or that of the gestures which accompanied them. He bent forward, towering over her with outstretched arms, huge, hideous, and half human.

Zaidie took a step backwards and, just as Redgrave whipped out one of his revolvers, she pulled the trigger of hers. The bullet cut a clean hole through the smooth, hairless skull of the Martian, and he dropped to the deck without a sound other than what was made by his falling body.

Zaidie took a step backwards and pulled the trigger.

"That's the first man I've ever killed," she faltered, as her hand fell to her side, and the revolver dropped from it. "Still, do you think it really was a man?"

"That a man!" said Redgrave through his clenched teeth. "Not much! Here, Andrew, open that door again and help me to heave this thing overboard, and then we'd better be off or we shall be having the rest of the fleet with their poison guns around us. Hurry up! Zaidie, I think you'd better go below for the present, little woman, and keep the door of your room tight shut. There's no telling what these animals may do if they get a chance at us."

Although she would rather have remained on deck to see what was to happen, she saw that he was in earnest, and so she at once obeyed.

The dead body of the Martian was tumbled out, Murgatroyd closed all the air-tight doors of the upper deck chamber, while Redgrave set the engines in motion and, with hardly a moment's delay, the *Astronef* sprang up into the crimson sky from her first and last battle-field in the well-named world of the War God.

6/5.84 Pearson's Magazine Feb. 1900.

BATHING IN ELECTRIC LIGHT

By Herbert C. Fyfe.

The great advance that has been made in the Healing Art in the nineteenth century would be sufficient if there were nothing else to mark it out as a century more fertile in discovery and invention than any, or all, of those that have gone before. Electricity, that mysterious force, has been applied with marvellous results in the medical profession, as it has in so many other walks of life; and among the recent uses that have been found for it in the cure of bodies, none can rank in higher importance than the Bath of Electric Light.

It has been found that there are many painful ailments which, when acted upon by electric heat and light rays, are completely banished from the sufferer's body. Strong electric light is thrown on to the seat of suffering; the patient basks in a bath of light and heat, experiencing nothing but pleasant sensations, and, in most cases, an immediate and comforting sense of relief from pain. Men and women, who for years have lost control of their limbs, and who have unavailingly tried every known cure, have arisen, after a course of electric heat baths, and walked with perfect freedom.

Doctors have shown a marked tendency of late years to treat many ailments by external, rather than internal, remedies. At the present time, as a medical paper puts it, there is a kind of heat-wave passing over the profession. There is nothing new in the idea. One can imagine the first human being who ever fell sick crawling into the sunshine to seek relief in the heat and light. That was the first case of the therapeutic use of heat, and the electric light bath is a cure founded on precisely the same principles, only better adapted to the same end.

In early times, those barbarians with whom sunlight was scarce, warmed stones, as do the Red Indians to this day, and placed them on their ailing bodies; or they sat themselves in rude ovens, and found comfort in the heat; and it is an historical fact that many Northern nations as Russians, Swedes, Tartars, and Finns, have had at all times, in some form or another, the hot-air bath.

Through the ancient Greeks and Romans, Turks and Russians, the idea of hot-air baths has been handed down to the moderns; while rheumatism, and kindred complaints, have been treated externally in all ages with blisters, leeches, hot sand, friction, and the like. At the present time, heat-cures of all kinds are in vogue in more abundance than ever before, in the form of poultices, hot-water bottles, fomentations, sand baths, mud baths, vapour and Turkish baths. To-day, every fashionable watering-place has its own particular kind of hot-air cure.

But the effect of all these remedies is limited by the fact that the heat they produce can only be borne at a comparatively low temperature, whereas a heat of 200° to 300° F. is required if there is to be any lasting benefit. Moist heat, however applied, becomes painful at 115° F., and unbearable at 120° F. Baths at 105°, and vapour at 115°, induce exhaustion so rapidly that they cannot be borne for any length of time. Hot-air

Pg. 120

baths are usually bearable at temperatures of 130° to 150°—but many people cannot breathe such hot air without incurring great risks, and it is on this account that the Turkish bath is used so sparingly by medical men, especially with patients suffering from weak hearts. If Turkish baths could be constructed so that patients could receive the benefit of the hot-air treatment without breathing the heated air, there would not be a city without these institutions.

For a long while medical men have felt the want of some more perfect device for producing hot air at a very high temperature; and when, a few years ago, an apparatus employing gas as a source of heat was introduced, doctors quickly availed themselves of the invention. But there were many objections to this contrivance—the main disadvantage being that the atmosphere was soon polluted by the many gas-jets employed, so that the patients were compelled to breathe air containing poisonous gases.

It was evident that electricity alone was suitable for producing the intense, dry heat that the doctors sought. A distinguished London physician determined to make experiments, and Mr. H. J. Dowsing, M.I.E.E., of electrical-cooking fame, devised the precise apparatus he required. The result was the invention of what is now known as the "Dowsing Radiant Heat and Light Bath"—and the establishment of many institutions, where now, daily, hundreds of sufferers from such ailments as gout in all its forms, rheumatism, cramp, stiff joints, stiffness, inflammation of the veins, neuralgia, sciatica, and other nerve troubles—are relieved from their pains by a pleasant process, immediate in its good effects.

The apparatus which enables patients to bathe in electric light is extremely simple. To an adjustable stand are fitted two large copper or nickel-plated reflectors, which can be moved in any direction. If a patient is lying in bed, reflectors are placed on either side, adjusted to the exact position for locating the rays where desired. On the reflecting surfaces are the electric lamps, which radiate the luminous heat-rays. The heat may be regulated by varying the distance of the reflectors, or the number of lamps, or by means of a special regulator which controls the electric current. Those parts of the body, such as the armpits, or shoulders, which it would be impossible to treat locally with other arrangements, are easily dealt with by the new system.

When the patient is in the right position, and is comfortably settled (he may be fully clothed, or covered with blankets, without affecting the power of the rays), the current is turned on, and heat and light of considerable intensity are immediately produced. In a few moments the thermometer will register 300° F. I have seen patients chatting cheerfully, and experiencing no inconvenience, while an affected limb has been exposed to heat-rays at a temperature of 400° F. It might be supposed that such a heat as this would roast a limb! Undoubtedly, there would be evil results, were it not for the important fact that *dry heat* is employed, which evaporates perspiration as soon as it appears on the body.

Treatment of the hand by electricity.

The baths usually last for forty minutes, or an hour, and it is to this prolonged application of the brilliant light and the intense heat, bearable under no other circumstances, that the marvellous results are mainly due. The rays may be applied in three ways: They may be directly applied to the body without heating the surrounding air; they may be partially screened, so that they fall only on one spot, as on an arm, or

A patient under treatment for sciatica. The apparatus has been opened out in order to show exactly how the rays are directed.

hand; or they may be diffused, and caused to heat the air surrounding the patient. As a rule, better results are obtained when a complete body bath is taken, even when the ailment to be treated is only in one limb or joint.

The result of the bath is that a free perspiration breaks out over the whole body, even when the rays are applied only locally; at the same time the body temperature is raised as much as one, two, or even three degrees, a physiological effect hitherto regarded as impossible. There is an increased circulation of the blood; the pulse increases in frequency, and also the respiration, but a few minutes after the bath, pulse, respiration, and temperature return to their normal or previous condition — while an hour later the pulse is found to be slower and stronger than before, especially in the case of patients with weak hearts. With painful afflictions, the pain is almost immediately relieved on the application of the rays. After the bath the whole body is briskly rubbed with a dry towel, and perhaps massaged—and the patient rises from his bed, a new man.

The peculiarity of the heat supplied by the electric lamps is that the rays require no medium, but may be radiated directly on to the body, even through a glass screen, or in a vacuum. The air surrounding the bather may be freezing, yet the body would still be warmed by the radiation from the electric lamps. In all other baths of a similar character air as a medium is necessary in applying the heat to the body.

It is a remarkable fact, of which no satisfactory explanation is forthcoming, that luminous heat-rays are much more intense than obscure or invisible heat-rays. When for instance, you warm your hands at a fire, the heated air plays a very insignificant part in the process—the effect is produced by direct heat-rays. The tissues of the body can only be efficiently penetrated by the use of luminous heat; in fact, several medical experts, who have tested the electric heat-baths, declare the good results to be due as much to the light as to the heat.

The electric light-rays so closely resemble the sun's rays, that they will cause sun-burn and freckles when directed for any length of time on the uncovered skin. This discovery

is full of possibilities—no doubt there are slaves of the desk, who, when it becomes generally known, will take electric heat and light baths for the sake of gaining a complexion which may compare favourably with a yachtsman's, after a long cruise in the tropics.

There are portable appliances for giving electric baths; which may be connected with ordinary electric lamp wires, thus allowing patients who are unable to leave their beds, or to visit one of the Radiant Bath Establishments, to be treated at home

One important development of this method of treatment is in connection with the open air system of cure for consumption. Exhaustive trials are being made and great results are expected.

The bacillus of consumption cannot live at a temperature of 170°, and it is hoped that it will be found possible to pass the electric heat and light rays at this temperature into the lungs, if only for a short period, and so kill the disease in the most direct manner possible.

It would be tedious to describe the cases where wonders have been worked in the cure of all manner of ailments by the electric light baths—they are numbered by the thousand already, in spite of the fact that the idea has only come into operation during the last two years.

Under treatment for a stiff neck.

It may be mentioned that these baths have been sought after throughout the world, but nowhere have they been more appreciated than at the well-known Footballers' Hospital, at Matlock House, Manchester, England. Many severe cases of sprains, inflammations, swollen limbs, and other results of football, which would have taken weeks to cure by the old-fashioned methods of poulticing and embrocation, have yielded to the light and heat rays in a few hours—and, of course, such rapid cures are of inestimable worth to those who earn their living by playing games.

London doctors are now recommending the heat baths to those who have exhausted themselves in the gaieties of the London season, and who, in the ordinary way, would seek recuperation by taking the waters of Continental Spas. A long journey, and a long, tedious sojourn in some dull French or German health resort is thus avoided, to say nothing of the accompanying expense, while half-a-dozen electric light baths will do more to revive jaded bodies and spirits than any number of mud, water, grape, or other fanciful cures.

500 Radiant Heat Bath, maximum bearable heat without danger, for treatment of single limbs.

400 Radiant Heat Bath, maximum bearable heat for full body bath.

300 Radiant Heat. Bath comfortable.

240— Very hot Turkish Bath.

212— Water boils.

200

180— Hot air dangerous to breathe for lengthened periods.

130— Hot air bearable.

120— Vapour baths unbearable.

115— Vapour baths painful.

105— Vapour baths exhaust rapidly.

100

98— Blood heat.

76— Summer heat.

32— Freezing.

0

An interesting Fahrenheit thermometer.

By Allen Upward.

No. II.—A SECRET OF THE TOWER OF LONDON.

Within the walls of the Tower of London in the year 1613 there took place one of those dark and extraordinary transactions which historians have vainly attempted to unravel.

The Lieutenant of the Tower at this time was Sir Gervaise Helwysse, a worthy and religious person, whose discreet conduct had earned for him the name of wise Sir Gervaise. This gentleman, on sitting down to his dinner one morning, happened to observe among the attendants a certain gaoler who had not been long in his service, called Weston, making furtive efforts to catch his eye.

Curious to know what this man wanted, the Lieutenant nodded for him to approach. Thereupon Weston stepped close up to his master, and, lowering his voice, put this singular question:

"Shall I do it now?" His eyes at the same time wandered in a very significant manner towards the dishes on the table.

"Do what?" demanded Sir Gervaise, thoroughly mystified by these manœuvres.

Weston's conduct became still more inexplicable. Instead of answering, he drew back in confusion, at the same time throwing at his master a surprised, reproachful glance.

It was not for nothing that the Lieutenant had received his name of wise Sir Gervaise. Dropping his inquiry for the present, he contented himself with saying quietly:

"No, not yet."

At the same time he gave a warning frown to the gaoler, who turned away, and, presently went out of the room.

Determined to penetrate the mystery, Helwysse hurried over his dinner, and as soon as it was finished, shut himself in his private room and sent for Weston. In those days the position of a governor of a prison was sometimes a dangerous one. There were two kinds of prisoners, those who were obnoxious on public grounds, and those who were obnoxious for private reasons to powerful personages. The first class of prisoners gave very little trouble; it was simply necessary to see that they did not escape; but the second class were a source of much greater anxiety, and it was not always their escape which formed the chief danger to be guarded against.

The question put by Weston showed that he believed the Lieutenant to be privy to some secret design. Judiciously availing himself of this misunderstanding, Sir Gervaise contrived to draw from the man an admission

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Dublin Journal of Medical Science, March, 1901.

A CRITICISM ON THE LIGHT TREATMENT OF LUPUS.

R. Stapleton has investigated this plan of treatment so ardently advocated by Finsen, and is inclined to be sceptical as to its real value. In the first place he calls attention to the fact that the mucous membrances of the nose and lips have not been found suitable for treatment, partly because the pressure of the apparatus employed to keep the light from hurting the patient cannot be borne and partly becouase, owing to irregularity of surface accurate focalization is impossible. Neither can the septum nasi, owing to its inaccessibility, be acted on by the rays of light. Now, as the mucus membranes of the nose and lips and the septum nasi are parts frequently attacked by the disease, this at once estanlishes a very serious limitation. To get over the difficulty other methods are emploued to supplement the l i light, and, in addition to the usual chemical, mechanical, and thermal agents generally adopted, the x-rays are commonly used. The action of the light causes an irritation of the skin, varying in severity from a slight erythema to the formation of vesicles and desquamation. Each time the light is applied an inflammation of the skin is set up which lasts about twelve hours. In Stapleton's opinion it is this inflammatory reaction which brings about the cure when one is effected-- the bacteria being killed incidentally. The advocates of the light therapy admit that the early and superficial cases are those which afford the best prospect of cure, but these are just the cases that would naturally be the most amenable to other forms of treatment. Even six months' continuous treatment with the light therapy fails to cure many cases, and the length of time necessary in any case to produce beneficial results is another great objection to the plan. From three to four months are necessary, with a daily attendance of one hour. The apparatus required is very expensive, and its management requires a large force of assistants with special training.

The Lancet.P. 286. July, 28, 1900.

THE LIGHT TREATMENT AT THE LONDON HOSPITAL.

More than three years have now elapsed since Finsen of Copenhagen introduced to the profession his method of treating lupus by means of light, and the favourable evidence obtained at his clinic is amply sufficient to justify a more extended employment of this valuable agent in the treatment of this troublesome disease. Although Professor Finsen has used his method for three years, yet it is only a little more than six weeks since any public institution in this country has been in a position to emply this therapeutic aid. The London Hospital is the pioneer in this matter, and this is due partly to the gift to the Hospital by the Princess of Wales of some fo the apparatus needed for its working and partly to the praiseworthy energy og the authorities of the London Hospital who have done all that can be required for the efficient working of the method. The "light cure" is carried on under the superintendence of Dr. Stephen Mackenzie and more immediately under the direction of Dr. J. H. Sequeira who attends for several hours daily for that purpose. A fair-sized ward has been set apart for the treatment and it includes dressing-rooms for the patients. The apparatus consists of an arc light surrounded by a shade so as to prevent the eyes of those present being dazzled. From this light there radiate four or more telescopes, each telescope conveying the light to one patient. The telescope contains lenses composed of quartz which has less obstructive effect on the active rays than any other refractive medium. The space between two of the constituent lenses of the telescope is filled with distilled water to moderate the temperature and an enclosing water-jacket serves still more to abstract the heat. The lenses are so arranged as to render convergent the divergent rays proceeding from the arc light, and they are brought to a focus by another lens which is held in position by a nurse. This lens is composed of two plates, which may be of quartz or even of glass, and the space between them is filled with water and may be connected with a supply so that there is a continuous replacing of the water which may have

become heated by water which is cold. This cooling lens is held by the nurse and pressed by her fairly firmly on to the affected part. The object of this pressure is to render anaemic the part to be treated, a it ahs been found by experience that the therapeutic effect is mych great er if the tissues are bloodless than if the circulationin them is proceeding normally. The active rays seem to be those which are usually called actinic, and are ultra-violet in the spectrum; they are therefore the most refractive rays, and they are accurately focussed on the part, the pressure being so adjusted that a red halo is seen surrounding a colourless centre of a little less than a shilling in size. The lens pressing on the skin may be held in position by rubber bands, but it is thus liable to shift and the employment of an intelligent nurse gives much more satisfactory results. It is, however, necessary that the nurse's eyes should be protected by coloured spectacles, as the light reflected from the lens pressed on the skin is intensely brilliant. Whenever it is necessary to readjust the position of the patient a red cloth cap is placed over the lower end of the telescope. The patient lies on a raised table or is seated in an adjustable chair the position of which can be varied so thath the rays of light shall fall perpendicularly on to the skin. Each application or seance lasts about an hour and as each patient is treated only once a day and the department is open from 9 A.M. to 12:30 P.M. three sets of patients are under treatment every day, an interval of a few minutes being allowed between sittings. The nurses after a little practice do not find it at all tedious to keep the compressing lens in position, exerting pressure at the same time, even though it lasts three hours each day. Great care is taken against sepsis; in order to prevent any such accidnet a separte pressure lens is kept for each patient and also separate parts of any other portion of the apparatus which comes in contact with him. These are kept in a series of lockers inscribed with the patient's names. Care is taken to protect the eyes and the unaffected parts of the patients' skin from the effects of the light rays.

The light is provided by an arc light taking 60 to 80 ampere of current. This is obtained in the following way: the public electric main is employed to work a converter which increases the amperage of the current from 10 to 60 or 80, while reducing its voltage from 140 to 60. The present converter is quite capable of supplying two such arc lamps as that employed at present, so that the capacity of the department could be doubled if necessary.

The same treatment can be carried out by the employment of the direct rays of the sun, and a small portion of the grounds has been shut off by a high paling from which can be hung curtains so as to exclude the gaze of the curious. The parallel rays of the sun are focussed on to the part by a large hollow lens containing an ammoniacal solution of copper which absorbs a large proportion of the heat rays. A separate lens has to be employed for each patient and a pressure lens, like that used with the electric light, is held against the affected part. There is no essential difference in the results obtained by the two methods.

The effect on the patient is in no way painful; the application itself causes no discomfort, and in so far as it is felt at all it is said by the patients to give a sensation of gentle warmth. BUt a few hours after the first application there is a certain amount of "reaction"; the part swells, becomes reddened, and is tender, but even then there is not real pain. This reaction varies in degree in different cases and is always seen in lupus vulagaris, but does not occur in cases of lupus erythematosus, so that it may be of some diagnostic value. As a rule it may be said that the greater the reaction there is the better the result. The beneficial affect of the treatment is often manifested whithin a few days, and one or two cases have occurred in which recovery ensued after only a few applications Generally about 15 to 20 or 25 applications have to be employed before a satisfactory result is obtained. At one time an area not larger than the size of a shilling can be treated, so that if the diseased patches are extensive a prolonged course of treatment is required. The results, however,

are eminently satisfactory; the skin becomes smooth, soft, and pliable, and what scar there is attracts little notice. The cases that are the most suitable are those with small recent patches of disease, but extensife chronic cases are improved, though not so rapidly. Lupus vulgaris seems to be the only disease in which the results are marked; in lupus erthematosus there is a little beneficial action , and one case of this disease is now under treatment at the London Hospital. It is early yet to speak of the permanence of the result, but Professor Finsen finds that recurrence occurs in only a small proportion of the cases, and in those a little further treatment removes the recurrent in those a little further treatment removes the recurrent disease. When each patient is first admitted to this treatment at the London Hospital a photograph is taken, and we hope in a few months'stime to show the results when sufficient interval has occured to render it probable that recovery is permanent. It is intended in a short time to provide an afternoon seance for paying patients if a sufficient number present themselves. Whatever may be the ultimate verdict of dermatologists on the Finsen treatment no one can deny the striking beneficial effects in lupus of this variety of phototherapy.

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Med. Record. April 27, 1901. P. 679.

Manhattan Dermatological Society

PHOTOGRAPHIC APPARATUS.-- Dr. Gottheil presented an elaborate apparatus for the Finsen treatment of various dermatological affections.

LUPUS VULGARIS.-- Dr. Geyser exhibited a patient with an extensive lupus vulgaris of the face, which had been successfully treated with the x-ray. The right side at present showed a large, smooth, shining cicatrix and a few linear masses: The left side showed a superficial burn and a mild degree of alopecia due to the rays. Each séance lasted from seven to ten minutes and was followed by a ststic spray for the relief of pain. This method was superior to Finsen's because exposure was shorter and the penetrating power was greater.

R. E.12-1,'98

THE ELECTRO-HYDRIC OR ELECTRO-THERMAL BATH.--This bath is simply a water bath with the addition of electricity; either faradic, galvanic, or sinusoidal electrical currents may be ~~used~~ employed . The electricity is communicated to the patient in the tub by means of a stationary head plate and sliding metallic electrodes on either side. The electrical apparatus may be placed at the head of the of the bed or in any other convenient place, in easy reach of the operator. The temperature of the bath depends upon the effects desired; the temperature most commonly employed is from 92° to 98°.

When tonic effects are desired the faradic current is most commonly employed. The temperature of the bath may be from 92° to 95° for five to six minutes, and at the last end cooled to 80°, the patient being rubbed in the meantime to prevent chilling. The strength of the current should be such as to produce distinct tingling in the various parts of the body to which the current is directed, but not sufficiently strong to cause contraction of the muscles .

When sedative effects are desired the temperature of thebath should be 92° to 97°--ordinarily about 95°, and the galvanic or sinusoidal current should be employed. The bath should be continued for ~~twelve~~ twelve to fifteen minutes. The direction of the current should be from head to foot, that is, the positive pole should be connected with the head of the bath, the negative with the foot .

The electric neutral bath is an excellent ~~means~~ application in insomnia. It is in fact adapted to all classes of cases in which the nervous system is abdormally irritable.

The sinusoidal current is especially useful in cases in which neuralgic pains are a prominent feature of the nervous irritability.

In administring the electro-thermal bath the current should be entirely turned off before the patient enters the bath, and then should be turned on very gradually until the current is just sufficient to produce decided sensations, as tingling, prickling, and other sensations. Great care should be taken to avoid giving the patient a shock of any kind by the sudden interruption of the current. This is of especial importance in the case of the galvanic bath . If the bath is supplied with electricity from a street-current of high tension, as a 500 volt or 1000 volt, current, great care must be taken to avoid ~~xxxxx~~ the possibility of a sudden afflux of current which might be in the highest degree dangrous to life. On this account it is better to supply the galvanic bath with a current from a cell battery of such size that the total current furnished by it will not be capable of producing more than temporary inconvenience .

THE SUN BATH OR INSULATION.--Sunlight is one of the most powerful of all hygienic and curative agencies. As a hygienic agency it is of inestimable value in the destruction of dangerous microbes, the most of which are unable to resist the action of the direct rays of the sun for more than a few minutes. Sunlight is thus the most important of all disinfecting and sterilizing agencies. The value of sunlight in the maintenance of health is well shown in the dwarfed ~~xxxxxxxxxx~~ development or rapid deterioration of plants deprived of its stimulating influence. In caves, mines, and other places excluded from the influence of the light, plants, with the exception of the fungi, do not grow, or if they do, they quickly die, never attaining ~~x~~maturity. Animals also are dwarfed and sickly under these conditions.

It was long~~xx~~ago noticed that in hospitals ~~the~~ a larger percentage

of recoveries occurred on the sunny side than on the shady side of the ward. At least a part of the well- known good effects obtainable from an out of door life or from systematic exercise out of doors must be attributed to the influence of the sunlight.

In taking a sun-bath either the whole or a part of the body may be exposed to the direct influence of the sun's rays, or some protection may be afforded by a covering of white cheesecloth .

IThe bath may best taken in a room properly constructed for the purpose. The room should face the South, the windows should be very sloping, and before the window should be placed a cot on which the patient should lie. The head should be protected from the direct rays of the sun. The length of time the patient should remain in the bath depends upon the intensity of the sun's rays, and the effects sought. If the sun's rays are very intense or the patient is very feeble, the bath should not be continued more than five minutes if the whole body is exposed. In less sensitive patients or those accustomed to the sun-bath, it my be continued to twenty minutes, or half or three quarters of an hour.

<u>Physiological Effects:</u> The effects of the sun bath are in many respects similar to those of the hot baths. The effectsm however, are more thorough going and profound than those which result from the hot water bath, the Turkish. vapor, hot air, and Russian baths. The sun's rays effect not only the skin, but pass through the skin into the body, exciting and stimulating every nerve, and every cell, of the entire body, the surface circulation is greatly accelerated, free perspiration occurs the heart's action is increased and the activity of all the vital functions is increased. In many cases the patient experiences very pronoun-

ced sensations of languor, ~~if~~ ~~not~~ often drowsiness. Not infrequently the patient falls asleep in the bath.

The effects of the sun-bath are practically identical with those of the electric light bath, which has previously been described. ( )

Therapeutic Applications. The sun bath is useful in all cases of malnutrition, anemia, inactivity of the skin, chronic dyspepsia, most cases of neurasthenia, indigestion, chlorosis, rheumatism, diabetis and obesity . The only class of cases in which the bath is positively contraindicated is that in which the patient has recently suffered from heat-stroke, and is especially susceptible to the action of the direct rays of the sun.

The ancients made great use of the sun-bath in the treatment of the sick. According to Plutarch, Diogenes, the renowned Athenian cynic, was, in his old age, accustomed to lie in the sunshine for the purpose of recruiting his energies,--a custom which, according to Pliny, was common among old men in Greece. It is stated that Diogenes valued his sun-bath so highly that when calbd upon by Alexander, who offered to render him any service in his power, he replied in answer to his kind offer, "Only stand a little out of my sunshine." According to Pliny the custom of the sun-bath was common among the Romans. Indeed, both the older and the younger Pliny were accustomed to spend an hour in exposure to the sun daily after dinner. Hippocrates prescribed the sun-bath for chills. Numerous other evidences might be cited of the ancient use of the sun-bath, but these will perhap be sufficient. A French physician once said to some people who had brought their children to him for treatment, Take these children to the country; feed them as well as you can; but above all, roast them--roast them in the sun."

Suggestions and Precautions.-- It must be remembered that some people are very susceptible to the sun's rays so that untoward effects resembling or identical with heat-stroke are very readily produced. On this account it is well to be constantly on the look-out for cases of this class and the patient should be under careful supervision during the bath, especially during the first applications. If the sun's rays are very intense it is well to throw a sheet over the patient at the first application to avoid the possibility of extreme effects.

IRRIGATION.2-In this procedure a compress consisting of sevral thickness of cheesecloth or soft muslin, or a mass of absorpent cotton, having first been saturated with cold water, is laid upon the part to be treated. It is then kept moist by an arrangement whereby cold or cold water is made to trickle slowly upon the compress, thus keeping it saturated and constantly changing the water which it contains so that as fast as the water in contact with the skin becomes warm it is displaced by water of a lower temperature. The parts should be so disposed as to be inclined somewhat that the water which enters the compress at the upper end will run away at the lower end. By means of a surgical cushion or an oilcloth the water may be collected as it runs away in a vessel at the side of the bed or couch. A ~~xxxxx~~ convenient arrangement for conducting the cold water from the container to the limb is a simple siphon, as shown in Fig.....The tube should be so constricted by tying a string about it or other means that the water will flow at just the right rate to maintain the temperature desired. If a fountain with a stopcock is employed the flow of water may be regulated by the cock.

The Physiologi cal Effects and the Therapeutic Applications of this procedure are the same as for the ordinary compress; the only different is that by the method of irrigation the temperature of the appli ation may be maintained at a certain point so long as may be desirable; thus reaction may be easily suppressed. The method of irrigation is especially applicable in cases of wounds, burns, bruises, and other injuries in which the dressing cannot be readily removed without irritating the injured surface.

Suggestions and Precautions It shoul be remembered that when a very low temperature has employeddthe parts may be so devitalized by the long-continued applitation of cold as to be injured. Consequently water at a higher temperature hould be employed for a brief period daily several times a day to afford a chance for circulation.

We have been asked by many of our correspondents to suggest articl- of food which are suitable for persons suffering from fever. This is a most important question. The diet generally recommended is milk. In many fevers, especially typhoid fever, it would hardly be possible to make a worse selection. Meat broths, beef juice, etc., are still less wholesome, but a milk diet is without doubt in large degree responsible for the diarrhea, the coated tongue, and many of the worst symptoms characteristic of this disease.

If milk is taken at all in fever, it should be in the form of butter milk or kumyss; but it is better to discard milk and to administer some of the foods named in the next paragraph. For the first three or five days a diet of fruit juices will be amply sufficient. The patient may be allowed to take all he wants of natural fruit juices, such as apple juice, grape juice, orange juice, etc. The addition of cane sugar is objectionable. Malt honey, the sweet syrup obtained by stewing raisins in a small amount of water, and California sweet wine are far better and more wholesome than cane sugar for sweetening purposes.

After the first few days, farinaceous foods should be taken, but should be well dextrinized; that is, they should be cooked in such a way as to produce slight browning of the starch. This converts the starch into dextrin, and renders it easily digestible. Saliva is necessary for the digestion of starch, but the fever patient produces very little saliva, hence the digestion of starch is difficult. Thoroughly dextrinized or predigested starch is preferable for this reason. Malt honey, malted cereal, and other preparations are of great value on this account. The value of the following articles in the fever dietary has been abundantly demonstrated by actual experience in fever cases: Granola fruit gruel, granola nut porridge, granut gruel, Sanitas porridge, gluten almond nut porridge, gluten fruit porridge, vegetable broth, protose broth, nut broth, malted nuts, almond

cream, fruit coco, malt honey with fruit juice, fruit soup, fruit juice,-- grape, raspberry and apple,-- carbonated fruit juice, buttermilk, kumyzoon, kumyss.