

The *Schädellehre*, Phrenology,
and Popular Science

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Acknowledgements:

If you asked me a year ago what I was going to write my senior honors thesis on, I would have asked you, “what thesis?” In just the short course of one year, I made the decision to write a senior thesis in German Studies and am now submitting what is definitely, the largest and most fulfilling piece of work that I have produced throughout my four years at the University of Michigan. It was by no means a simple task and the course that my thesis took symbolizes that. And now, that I am looking at the completed product, I feel it is necessary to relive the process once again...but quicker and less painful.

Originally, I wanted to focus on scientific experimentation under the Nazis in Germany. With the help of many, this topic was slowly narrowed down to the field of neuroscience and the actions of neurologists and neurosurgeons in Germany during this time period. While conducting my research on my newly focused topic, I was given an article by Fernando Vidal on “brainhood” that discussed phrenology and tied it to the practice of eugenics. Having never heard of phrenology before, and with a slight push from the Honors director in the German Department, Professor Vanessa Agnew, I shifted my focus to phrenology. With only a few months to go before the end of the first semester, I rushed to learn as much as I could about this even newer topic. After sitting down with Vanessa and mapping out, what possibly could have been enough research projects worthy of a dissertation, I once again realized I needed to narrow my topic down. At this point, I chose to investigate the connection between phrenology and criminology for the sake of having a focus.

This was my focus going into the second half of the thesis writing process and at the same time that I met my advisor, Professor Peter McIsaac. Not entirely happy with the topic, I

met with Peter weekly and started over with my research at the beginning in order to reanalyze my primary sources with criminology in mind. After two months of discussing texts, and after my first written progress report, it became apparent to me, and I am sure Peter as well, that I did not want to write my thesis on criminology. The problem was that I wasn't entirely sure what I wanted to focus on instead. I felt like we had discussed enough for me to be able to write something though, so for my next writing sample, I just wrote like I was talking to Peter. 12 pages later, there was not a single word about criminology, but surprisingly enough, there was a focus. Luckily for me, it was something that I was really interested in. With just two months left, I began writing, and now have completed my thesis on the popularization of phrenology – not scientific practices during World War II.

The point of explaining how I came to my topic is to demonstrate how trying of a process it was for me write this thesis. It was by no means an easy endeavor and I have a lot of people to thank for aiding me. Most obviously I want to thank Peter McIsaac – there are not enough thanks I can give you for how much you have helped me with this project. Thank you for meeting with me nearly every Friday morning at 9 am in Bruegger's discussing Gall's and Spurzheim's primary texts. As much trouble as I had getting up for half of my morning classes every week, I found no problem getting up to go to our meetings. Reporting on what I read each week and the hour long conversations that followed really helped guide me in developing this thesis. You helped me shape my thoughts and arguments as well as led me through the whole process without me being fully aware of what was going on. More importantly though, you showed me how much fun it could be to conduct research in a field other than science and write a composition of such a large magnitude on my own thoughts and arguments. I couldn't have asked for a better adviser - thank you for sticking with me.

I would also like to thank Vanessa Agnew – you didn't get rid of me. Surprisingly enough, you did not scare me off even after making fun of me for not liking poetry and telling me my writing was lazy. Even now, I wish I had a poem that I could quote and say was my favorite, but I still have not found anything worthy. On a more serious note though, thank you for all of the help you gave me, especially during the first half of this process as I tried to understand why I decided writing a thesis was a good idea along with trying to figure out what my topic would be. There were multiple times I thought about giving up, but you pushed me to keep working at it. Your class on the history of German science and the discussions with our class continued to help mold my thoughts and the trajectory of my project. Thank you for everything and hopefully you won't tear my thesis apart too much during my defense.

Now that I have thanked the two people, besides my mom, who will read my thesis, there are a few others that need mentioning. For starters, I need to thank Alayna Schreier and Beth Pedersen, who helped convince me that I should write a thesis and stuck with me throughout the whole process. Furthermore I want to thank two of my housemates, Ben Fensterheim and Cristina Pecci. I doubt either of you know how much you helped me, especially with the multiple conversations about fMRI studies that we had this last semester of school. Also, thanks for letting me vent my frustration nearly every week about how my evil German advisers were making me do unbearable amounts of reading and writing and reassuring me that I would come out on top. Finally, I must thank my family, especially my mother, who I called multiple times a week asking for help and advice and who is the only person besides my advisers who read my thesis. I couldn't have done this without any of you. I'm sure there are some people I forgot to mention, but enough rambling – let's move on to the subject for which I am giving all these thanks.

Introduction:

In December 1798, a letter from Dr. Franz Joseph Gall was published in *Der neue Teutsche Merkur*, which outlined the system he had developed about his ideas on the neurological functioning of the brain. An early theory of cortical localization, Gall believed that the cerebral cortex of the brain was composed of many “organs,” which were responsible for human behavior. He thought the locations of these organs could be identified due to corresponding protuberances on the skull, which in his opinion, was shaped by the underlying brain. Gall called this system the “*Schädellehre*” or “*Organologie*.” Starting in 1796, he lectured about his system in Vienna, where he was a practicing physician, and in 1804, hired his most famous assistant, Johann Gaspar Spurzheim. Together, the two traveled around Europe conducting a two year lecture series, and eventually settled in Paris in 1807, where they published an extensive four volume set on Gall’s system. Before the second volume was completed though, Spurzheim separated from Gall and traveled to Britain alone. In Britain, Spurzheim spread the message that Gall had spread throughout Central Europe, but took the liberty to make changes to the original system. These changes he made, including the choice to adopt the name “*Phrenology*,” resulted in the mass popularization of the “science” beyond what Gall had intended. Due to the high levels of popularity it experienced in Britain, the United States, and other countries in the West, it is this altered form of the *Schädellehre*, as spread by Spurzheim but with Gall credited as the founder, which is commonly thought of today.

Recently, Bernard Lightman has analyzed how the popularization of science related to publication strategies in nineteenth century Britain. What Lightman describes as the second of four ways to studying “the development of science for the general reading audience in the

nineteenth century,” will be the focus my thesis, in regards to the “alternative science” phrenology and how it was directed at various audiences.¹ In his book, *Victorian Popularizers of Science*, Lightman analyzes how popularizers of science thought of their audiences and how this affected their publications and other popularizing techniques. He argues that these popularizers felt they provided their audiences with “both entertainment and instruction.”² A description of Gall’s and Spurzheim’s targeted audiences will fit into my larger argument to distinguish phrenology from the *Schädellehre*. In order to distinguish the aims of Spurzheim and later phrenologists, I will utilize a discussion of their audiences as well as point out how the purpose of their publications shifted from informing of the “science” of their system to focusing mainly on application and entertainment. Just as Lightman questions authorship, the authority to popularize, and audience in late nineteenth century England, I will pose these same questions of Gall and Spurzheim to analyze the means they used to spread their individual systems.³

Throughout this thesis, I will show how phrenology, although based on the fundamental principles of the *Schädellehre*, in fact separated itself from its founder and his system, and instead of developing itself as a “science,” chose to remodel and make itself more acceptable for a popular audience through the efforts of Spurzheim and later phrenologists. Although Gall himself exercised some desire to popularize the *Schädellehre*, which is evidenced by his lecture tour throughout Europe and publication technique in Paris, he appeared more focused on spreading the scientific aspects of the system than reforming social structures. I will argue that each time the system passed hands, the aim of phrenology and its practitioners changed to one primarily based on popularizing the system through ideas of social reform, therefore slowly

¹ Lightman, Bernard. *Victorian Popularizers of Science: Designing Nature for New Audiences*. Chicago and London: University of Chicago Press, 2007, 13–15.

² Ibid, ix.

³ Ibid, 10.

developing the *Schädellehre* into the form of phrenology that is now recognized and discredited today. Throughout this thesis I try to supplement my arguments with evidence from Gall's and Spurzheim's original texts. Because Gall resided in Paris when he published his six volume collection, I use an English translation of the original French text. Otherwise, Spurzheim's publications in Britain and Gall's letter in *Der neue Teutsche Merkur* are used in the language in which they were originally published.

Thus in the first chapter, I will start off by considering Gall, the development of his system, and the *Schädellehre* in its original form in order to set up the foundation for phrenology to make its entrance at the start of the twentieth century. The second chapter will begin with the introduction of Spurzheim to Gall's office and demonstrate how, although accompanied by Spurzheim, Gall spread the word of his system after leaving Vienna. This chapter will examine Gall and Spurzheim's lecture tour, their relocation to and actions in Paris, and conclude with a discussion of the reasons for their separation in 1813. In the third chapter, I will mention Spurzheim's actions upon leaving Gall, but will focus mainly on the changes Spurzheim made to Gall's system upon his entrance to Britain, and therefore, the start of the system of phrenology. The end of this chapter will provide a sketch of the course phrenology took in Britain and the United States through parties including and extending beyond Spurzheim, point out some of the growing differences between the *Schädellehre* and phrenology, discuss the growing tension between Gall and the new direction of his system, and ultimately lead to an argument for the need to recognize the distance between Gall and phrenology. Finally, the fourth chapter will provide a commentary on the dangers of the popularization of science through a discussion of the development of Gall's system from the *Schädellehre* to phrenology, and make ties to current trends, specifically in the field of neuroscience. This thesis seeks neither to vindicate Gall nor his

system by any means, but rather to document how Gall's system was adapted and what implications these changes had for the enduring reception of phrenology.

Although my thesis will contain a discussion of the ties between phrenology and neuroscience, especially with regards to brain imaging studies, phrenology is relevant to other existing problems today. As a potential biological explanation for the workings of the mind, Gall's system and phrenology were active in conversations about criminality and insanity throughout the nineteenth century. Ideas on criminal behavior, the means of punishing those criminals, and especially capital punishment changed during the second half of the eighteenth century to consider the idea of rehabilitation. Offering a biological reason for criminal's actions allowed phrenology to play a role in this conversation. Furthermore, Gall's system helped shift the prevailing attitude of insanity from a moral illness to a physical disease, and was thus important in arguing for the treatment of mentally ill patients. Connections between Gall's organization of the mental faculties and topics such as race and gender have also been identified. All of these issues are still prevalent in today's discourse just as they were throughout the eighteenth and nineteenth centuries. Therefore I feel it is important to at least mention how phrenology helped shape the debate on the topics of criminality, insanity, race, and multiple other topics throughout the nineteenth century even though phrenology is now discredited.⁴

⁴ For more on the link between both criminality and insanity with phrenology, consult Rafter, Nicole. *The Criminal Brain: Understanding Biological Theories of Crime*. New York and London: New York University Press, 2008.

Chapter 1: Franz Joseph Gall and the *Schädellehre*

In this, the first chapter, I will begin my discussion of phrenology with Franz Joseph Gall, the founder of the *Schädellehre*. After a quick biographical sketch, I will show how Gall himself was an innovator whose advance with the *Schädellehre* partly consisted of memorably reformulating multiple people's influential thoughts during the eighteenth. Then, I will move on to the product of these influences and provide a brief discussion of his published letter in *Der neue Teutsche Merkur* as the key point in time when a formalized system made its entrance to Viennese society in order to establish the basic, underlying principles of Gall's system. Throughout this chapter, I will point out key steps in the *Schädellehre*'s development as a means of drawing a basic trajectory of its development as a "science" and the similar steps Gall took in order to model his system as a "science."

Franz Joseph Gall was born on the 9th of March, 1758 to Joseph Anton Gall, a wealthy wool merchant and mayor of Tiefenbronn.⁵ The sixth of twelve children, Gall was encouraged by his parents to pursue a life within the Roman Catholic Church.⁶ Despite the wishes of his family, Gall decided to pursue a career in medicine. Having previously studied at Baden and afterwards Brucksal, Gall left for Strasbourg to begin his studies of medicine in 1777, moved to Vienna in 1781 to continue these studies, and finished his formal education in 1785.⁷ Gall remained in

⁵ Gall, F. J. *On the functions of the brain and each of its parts vol. 1*, Translated by Winslow Lewis. Boston: Marsh, Capen and Lyon, 1835, 1. Accessed November 12, 2010. <http://hdl.handle.net/2027/nyp.33433068200496> ; Greenblatt, Samuel H. "Phrenology in the Science and Culture of the 19th Century." *Neurosurgery* 37 (October 1995):790–805, 792. Accessed October 22, 2010. <http://journals.lww.com/neurosurgery/pages/default.aspx>. No information on Gall's mother was included in these sources.

⁶ Gall, *On the functions of the brain and each of its parts vol. 1*, 1. There is an extensive biography on Franz Joseph Gall at the start of this volume compiled by an editor from information in "The Transactions of the Edinburgh Phrenological Society," "The Edinburgh Phrenological Journal," and the "*Journal de la Société Phrénologique de Paris*."

⁷ Van Wyhe, John. "The authority of human nature: the *Schädellehre* of Franz Joseph Gall." *British Journal for the History of Science* 22 (2009): 5–36, 18.

Vienna to establish an esteemed private practice and was even offered a position as the private physician to the emperor of Austria in 1794, which he declined citing the need for time in order to continue conducting research.⁸ While in Vienna, Gall developed his system and gave lectures on it from 1796 to 1801, at which time they were ended by an imperial decree. Gall left Vienna in 1805 and settled in Paris in 1807, where he continued his researches. Most notably, he submitted a manuscript to the French Institute in 1808 on his system, and then published an expensive, four volume set (1810-1819) followed by a cheaper, six volume set (1822-1825) on his findings as well. While in Paris, Gall enjoyed a celebrated private practice alongside his researches until he suffered from a stroke in March, 1828, and ultimately died on the 22nd of August, 1828.⁹

Gall claimed that he started harboring feelings in his childhood that led to his investigations into, and development of, his organological system. “The schoolmates most formidable to me were those who learned by heart with such facility, that when our recitations came, they took from me the honors, which I had gained by my compositions. Some years afterwards I changed my abode, and I had the misfortune still to meet individuals endowed with a surprising facility for learning by heart.”¹⁰ In this quote, taken from the introduction of Gall’s six volume series, Gall identified his initial observation beginning in school and continuing throughout his education. These observations marked the start of a primitive scientific process for Gall. In this first stage, Gall identified something peculiar that he could not explain given his basis of knowledge and came up with a basic research question – why are these students better at memorizing than others? Because he was unable to explain this phenomenon, he needed to

⁸ Tomlinson, Stephen. *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*. Tuscaloosa: University of Alabama Press, 2005, 57.

⁹ Gall, *On the functions of the brain and each of its parts vol. 1*, 29.

¹⁰ *Ibid*, 58

search for, and come up with, some possible explanation on his own account. “It was then that I remarked, that all these resembled my former rivals in their large prominent eyes...Having still more assured myself [that the great facility of learning by heart and the prominence of the eyes was not the result of accident], I began to suspect that there must exist a connection between this conformation of the eyes, and the facility of learning by heart.”¹¹ Still in the first stage of his process, Gall began to formulate his hypothesis through means of correlating two of his observations – a propensity for memorization and the physically prominent eyes in the same individuals. Therefore, Gall concluded that there must be some sort of relationship between these two variables. With this hypothesis as his impetus, he would spend the end of the eighteenth century researching further explanations based on existing theories of the time, marking the second phase of his scientific process, which he later utilized to formulate his system and rationalize the correlation he found. Throughout the remainder of his lifetime, Gall moved on to a third phase, where he endlessly investigated in order to legitimize and publish his system for others to use as well as extend his original system to include explanations for similar phenomena. But before moving on to this third phase, we will focus on the second phase and the ideas that influenced the formulation of the *Schädellehre*.

Gall’s correlation between large prominent eyes and the ability to memorize would later lead him to conclude that the organ for “*Wort-gedächtnis*” was located in the frontal lobe of the brain, immediately behind the eyes. This initial conclusion demonstrated the close connection between the *Schädellehre* and physiognomy. Although concepts of physiognomy can be dated back to Aristotle and Plato, Johann Caspar Lavater and the publication of his four volume series titled, *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe*,

¹¹ Gall, *On the functions of the brain and each of its parts vol.*, 58–59.

revived discussions of physiognomy in Europe.¹² Published from 1775 to 1778, *Physiognomische Fragmente* had gone through 16 German, 15 French, 2 American, 2 Russian, 1 Dutch and 20 English editions by 1810.¹³ Ellis Shookman argues that the popularity of Lavater's books was so undeniably large at the end of the eighteenth and start of the nineteenth centuries that anyone who knew how to read or went to school during this time must have had at least some general understanding of Lavater's theories.¹⁴ Therefore, with such massive popularity of Lavater's ideas, it is hard to imagine that Gall did not come into contact with the ideas of physiognomy. In fact, physiognomy's popularity demonstrates that Gall grew up in an environment where he was frequently exposed to these ideas because they were practiced on a widespread, daily occurrence and would have been influenced by them to some degree. It isn't surprising therefore, that Gall would have looked at the facial features of his fellow students with a means of trying to decipher their character or moral inclinations. Whether or not Gall's system should be viewed as another form of physiognomy, we must recognize the foundation of Gall's system in physiognomical principles.¹⁵

After his graduation from medical studies, Gall remained in Vienna to establish himself as a private physician. As an esteemed physician, Gall benefitted from connections within the medical elite that allowed him to gain access to important medical institutions, such as the largest

¹² Twine, Richard. "Physiognomy, Phrenology and the Temporality of the Body." *Body & Society* 8 (2002): 67–88, 69–70. Accessed March 11, 2011. doi: 10.1177/1357034X02008001004.

¹³ Shookman, Michael. "Pseudo-Science, Social Fad, Literary Wonder: Johann Caspar Lavater and the Art of Physiognomy." In *The Faces of Physiognomy: Interdisciplinary Approaches to Johann Caspar Lavater*, edited by Ellis Shookman, 1–24. Columbia: Camden House, 1993, 2.

¹⁴ *Ibid.*, 2.

¹⁵ For more on the discussion about the ties between physiognomy and phrenology consult these texts; Twine, "Physiognomy, Phrenology, and the Temporality of the Body"; Gray, Richard T. *About Face: German Physiognomic Thought from Lavater to Auschwitz*. Detroit: Wayne State University Press, 2004; Pearl, Sharrona. *About Faces: Physiognomy in Nineteenth-Century Britain*. Cambridge, Massachusetts and London, England: Harvard University Press, 2010; and Shookman, *The Faces of Physiognomy*.

general hospital in Vienna and the adjoining new insane asylum.¹⁶ In conjunction with this privileged access, Gall was allowed to observe an immense number of patients suffering from mental disorders and compare the symptoms from these patients with their autopsies.¹⁷ Gall did not limit himself to asylums though. He visited prisons, schools and colleges, as well as had more private encounters, such as in the courts of Princes and the seats of Justice.¹⁸ “Wherever he heard of an individual distinguished in any particular way, either by remarkable endowment or deficiency, he observed and studied the development of his head.”¹⁹ Examining the skulls, and, whenever possible, the corresponding brains of such a vast number of patients helped Gall develop his system, the *Schädellehre*, and primitive theory of cortical localization.

It may have been through observing an extensive number of skulls and busts as well as retrospectively correlating their structures to behavior that Gall claimed to come up with the *Schädellehre*, but scholars claim there were more variables and influences that went into his system’s development than his initial interest and comparative anatomy. Whereas Macdonald Critchley traces the idea of the brain as the organ of the mind back to Plato and Pythagoras, and Samuel Greenblatt identifies Galen of Pergamon as the beginning of theories of neurophysiology, many of Gall’s contemporaries directly influenced the development of Gall’s ideas.²⁰ Charles Bonnet (1720-1793), for example, has been linked to Gall’s central argument for

¹⁶ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 20.

¹⁷ *Ibid*, 20.

¹⁸ Gall, *On the functions of the brain and each of its parts vol. 1*, 5.

¹⁹ *Ibid*, 5.

²⁰ This list of influences is by no means exhaustive. Samuel Thomas von Sömmering (1755-1830), for example, was another anatomist who studied the structure of the nervous system and became one of Gall’s leading critics. John Elliotson further identifies Bonnet, Tissot, and Cuvier (as well as Sömmering) as arguing for parts of the brain having specialized functions. Elliotson, John. *Human Physiology*. 5th ed. London: Longman, Orme, Browne, Green, and Longmans, 1835. Accessed March 18, 2011. <http://hdl.handle.net/2027/ucl.b3371756>.

the various, specialized organs of the brain²¹; Johann Gottfried Herder (1744-1803) and his law on the unity of nature have been argued to have directly led Gall to consider comparative anatomy as a tool for his investigations; and Johann Wolfgang von Goethe's (1749-1832) search for the *Urpflanze* is reminiscent of Gall's pursuit to define a standard for the structure of the nervous system.²² In fact, Gall even compared the structure and function of the nervous system to that of the structure of plants in his first publication, *Philosophisch-medizinische Untersuchungen über Natur und Kunst im kranken und gesunden Zustande des Menschen* (1791).²³ Interestingly enough, although Gall's first publication did not focus on the development of the *Schädellehre*, "the concept of the plurality and independence of cerebral organs" was discussed, "and that at a time when Gall had not yet begun dissecting," indicating Gall had formulated the basic ideas for his system early on.²⁴

Along with the influences of Bonnet, Herder, Goethe, and, as previously discussed, Lavater, there is one further icon that has been identified as key to the development of Gall's system – Albrecht von Haller. In the middle of the eighteenth century, Albrecht von Haller's doctrine of brain equipotentiality was the prevailing view of brain function.²⁵ Haller separated regions based on anatomical differences, such as white versus gray matter, instead of different functions in this doctrine, and emphasized these regions of the brain acting as a whole organ that functioned together, rather than as separate entities. Despite this being the leading theory in the

²¹ For a more in depth discussion of the link between Gall and Bonnet, consult: Lesky, Erna. "Structure and Function in Gall." *Bulletin of the History of Medicine* 44 (1970): 297–314. Accessed March 18, 2011. http://muse.jhu.edu/journals/bulletin_of_the_history_of_medicine/.

²² For a further description of the link between Gall and Goethe, consult Erna Lesky's "Structure and Function in Gall." For more on the connection between Gall and Herder, consult the same text, or also, "*Head Masters*" by Stephen Tomlinson.

²³ Lesky, "Structure and Function in Gall," 309.

²⁴ *Ibid*, 300.

²⁵ Zola-Morgan, S. "Localization of Brain Function: The Legacy of Franz Joseph Gall (1758–1828)." *Annual Review of Neuroscience* 18 (1995): 359–383, 364. Accessed March 11, 2011. www.annualreviews.org; Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 21.

1790s, at which point in time Gall was formulating his system, John van Wyhe argues that Gall was not alone in his ideas of cortical localization. Along with the ideas of Bonnet and Herder, “we should picture Gall living in a community of medical men preoccupied with similar themes. His theories were not radically new, but they were provocative and memorable.”²⁶

Gall shared the same ideas as some of his peers, and in fact used their ideas to help form his system. What separated Gall from his contemporaries in Vienna and peers such as Bonnet and Herder though, was that Gall dedicated himself to attempting to justify and spread the *Schädellehre*, which, as van Wyhe puts it, was both “provocative and memorable.” Gall put in a conscious effort to investigate and publicize as a means of entering into a conversation with and offering an alternative to the dominant theory of the time, Haller’s doctrine of brain equipotentiality. His technique of lecturing as a means of publicizing his ideas was what specifically separated Gall. Although most of his contemporaries published great works on their ideas, Gall went the extra step to lecture in order to reach a broader audience, making it memorable to people on a wide scale. According to Andreas Daum, the number of individuals in German speaking areas at the middle of the eighteenth century who could read was around 10%. This increased to around 15% in 1770 and 25% in 1800.²⁷ Although the focus of reading changed from an “*intensiv*” approach to “*extensiv*,” marking an overall increase in reading for leisure, lectures were expanded outside of private spheres due to an increase in demand.²⁸ At the end of the eighteenth century, spoken lectures were by far the best means for popularizing a “science” because the vast majority of the German-speaking population could not read, as

²⁶ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 20.

²⁷ Daum, Andreas. *Wissenschaftspopularisierung im 19. Jahrhundert: Bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Öffentlichkeit, 1848-1914*. München: Oldenbourg, 1998, 238; “Inzwischen sind sogar die gängigen Schätzungen angezweifelt worden, wonach um die Mitte des 18. Jahrhunderts im deutschsprachigen Raum ca. 10% der Bevölkerung lesen konnten, 1770 ca. 15%, um 1800 etwa 25%, bevor dieser Anteil noch im Vormärz auf ca. 40%, bis 1870 auf ca. 75% und bis 1900 auf etwa 90% gestiegen sei.“

²⁸ *Ibid*, 238.

symbolized by the increased demand for lectures.²⁹ Furthermore, lectures were a practical means of reaching a mass audience. Therefore, the best means of spreading new ideas in the German-speaking population at the end of the eighteenth century was through verbal, rather than written media.

Lecturing in Vienna served this purpose for Gall, who sought to use both forms of media. Gall, who is described as a great orator, only published his letter while living in Vienna.³⁰ This letter was not the only publication floating around Vienna on the *Schädellehre*, but it was the only piece of writing Gall published in Vienna on his system. Those who attended Gall's lectures, which he started two years before publishing his letter in 1798, were so moved by what he had presented, that they took it upon themselves to publish pamphlets and notices on the lectures, aiding Gall in spreading awareness and publicizing his newly developed system through written means.³¹ The success that Gall experienced with his lectures in Vienna, and would later receive after leaving Vienna, started a long tradition of his successors in phrenology to his system lecturing in Britain and the United States as a necessary tool for publicizing the system, aided by written publications.³² It is important to note though that the audiences of these lectures started off as mainly members of the elite class but shifted to include more lay members of society as his system gained notice.³³

Using key arguments from all of his contemporaries, Gall began the endeavor of formalizing his system in 1792 through collecting specimens for comparative anatomy purposes and began lecturing in Vienna in 1796, marking the second phase of his scientific process, which would culminate with the first formal publication of the *Schädellehre*. By 1802 his collection was made

²⁹ Daum, *Wissenschaftspopularisierung im 19. Jahrhundert*, 242.

³⁰ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 34.

³¹ Gall, *On the functions of the brain and of each of its parts vol. 1*, 19.

³² *Ibid*, 19.

³³ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 33.

up of three hundred human skulls and 120 plaster casts, all from the skulls of people with relatively pronounced characteristics.³⁴ With all of the empirical evidence he gathered from these specimens, Gall published an outline in the form of a letter in *Der neue Teutsche Merkur*, marking his first publication dedicated to the subject in 1798. In this letter, Gall laid out his argument, the fundamental claims of his system, as well as pointed out the practical applications that his system could have in the fields of law, medicine and ethics.³⁵ The basic premises are laid out as seven principles, which Gall refined into four major points in later publications:

1. „Fähigkeiten und Neigungen find dem Menschen und dem Thiere angeboren.
2. Die Fähigkeiten und Neigungen haben ihren Sitz, ihren Grund, im Hirne.
3. 4. Nicht nur die Fähigkeiten sind wesentlich von den Neigungen verschieden und unabhängig, sondern auch die Fähigkeiten unter sich und die Neigungen unter sich, sind von einander wesentlich verschieden und unabhängig; folglich müßen sie ihren Sitz in verschiedenen und unabhängigen Theilen des Hirns haben.
5. Aus der verschiedenen Austheilung der verschiedenen Organe, und aus der verschiedenen Entwicklung derselben, entstehen verschiedene Formen des Hirns.
6. Aus der Zusammenstellung und Entwicklung bestimmter Organe entsteht eine bestimmte Form theils des ganzen Hirns, theils einzelner Theile oder Gegenden desselben.
7. Von Entstehung der Kopfknochen an bis zum höchsten Alter wird die Form der innern Schädelfläche von der äußern Form des Gehirns bestimmt; folglich kann so lange auf gewisse Fähigkeiten und Neigungen geschlossen werden, als die äußere Schädelfläche mit der innern übereinstimmt, oder von den bekannten Abweichungen keine Ausnahme macht.“³⁶

In the principles of his system, Gall argued for the innateness of the different propensities and faculties of the brain as well as the presence of different combinations in different species of animals. Gall further described the relationship between the organization and development of the brain with the structure of the skull, and how this differed amongst various species because of

³⁴ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 22.

³⁵ Gall, F. J. “Des Herrn Dr. F. J. Gall Schreiben über seinen bereits geendigten Prodomus über die Berrichtungen des Gehirns der Menschen und der Thiere an Herrn Jos. Fr. Von Retzer.” *Der neue Teutsche Merkur* 70 (1798): 311–332, 312–313. Accessed March 7, 2011. <http://hdl.handle.net/2027/inu.30000003083957>; „Die wichtigsten Wahrheiten und Folgerungen, welche sich hieraus für die Arzneywissenschaft, für die Sittenlehre, Erziehung, Gesetzgebungen u.s.w und überhaupt für die nähere Menschenkenntniß ergeben, einleuchtend vorzutragen.“ For a translated version, see Gall, *On the functions of the brain and of each of its parts vol. 1*, 7–19.

³⁶ Gall, *Der neue Teutsche Merkur*, 314–323.

the presence of, or lack thereof, certain organs. Most importantly, he illustrated how certain organs could be located due to the shape of the outside surface of the skull. Interestingly, Gall described the relationship between all of the propensities and faculties as a *Kampf*, identifying an internal struggle that a person's brain undergoes on a constant basis. Not only did man have the primitive organs that are present amongst all of the animals, but he also had higher order organs which allowed for this struggle.³⁷ The idea of a conscious in competition with primal urges anticipated the ideas published by Sigmund Freud about the psychoanalytic unconscious at the start of the 20th century.³⁸

In *Der neue Teutsche Merkur*, we see a highly developed system already in place focused on describing the nature of man through the organization of his brain. The primary, underlying principles were summarized and Gall even pointed out the components and impacts that the system would have on social structures. He did not, however, introduce his audience to the nature of any of the organs he identified at this point. Gall furthermore tried to define his system within the realm of "science" by limiting his discussion to the physiology of the brain. Later, on his lecture tour and in publications, Gall introduced his anatomical findings, which were not completed at this point in time, as the scientific background for his organological physiology and psychology of the brain. Most of the structure to the letter entailed a description of the development and necessary parts of the system, but he also already engaged with criticism that his system had received. He denounced physiognomy, setting aside a spot to discuss the relationship between the two, and brought up his disdain for the use of the term "*Kranioskopie*"

³⁷ Gall, *Der neue Teutsche Merkur*, 314–323; "Der Mensch aber hat ausser den thierischen Eigenschaften, Sprachfähigkeit und ausgedehnteste Erziehungsfähigkeit; zwey Quellen von unerschöpflichen Kenntnissen und Beweggründen. Er hat Sinn für Wahrheit und Irrthum, für Recht und Unrecht, für Vorstellungen eines unabhängigen Wesensö das Vergangene und die Zukunft können seine Handlungen leiten; er ist mit dem Gefühle von Sittlichkeit und mit deutlichem Bewußtseyn begabt, u.s.w. Mit diesen Waffen tritt der Mensch gegen seinen Neigungen in Kampf.

³⁸ For more discussion on the connection between Gall and Freud refer to Richard T. Gray's book, *About Face*.

for the *Schädellehre*.³⁹ By setting up arguments against criticism, Gall demonstrated two things about the state of his system in 1798. The first is that it had been heard of by enough people to cause controversy, which needed to be addressed in his letter. Secondly, Gall had enough time to develop a response to these controversies. Because his system caused controversy and Gall was able to come up with arguments against these criticisms, the *Schädellehre* appears to have been a rather developed system in 1798. Thus, his publication in *Der neue Teutsche Merkur* symbolized the movement of Gall from the second to the third phase of his scientific process. He had developed and published on his system, but the next step, this third phase, was to further spread the word of his system and gather more supporting evidence to combat growing criticism.

Thus far, we have seen how Gall's system was a compilation of multiple thoughts prevalent in Europe throughout the eighteenth century mixed with anatomical observations Gall gathered himself. Furthermore, I have pointed out three major steps that Gall took to form a "science" out of his system. The first stage was characterized by preliminary observations, the formation of a question, and his hypothesis to that question. The second stage consisted of conducting research and developing his system in response to his findings. In the third stage, Gall began publicizing his system through lectures and his publication in *Der neue Teutsche Merkur*. As will be shown in the next chapter, Gall remained in this third stage, further publicizing his system and submitting a manuscript to the French Institute, demonstrating his own perception of his system as a "science."

³⁹ Gall, *Der neue Teutsche Merkur*, 330; „Über Pysiognomiy. Hier zeige ichh, daß ich nichts weniger als Pysiognomiser bin. Ich höre, daß die Herrn Gelehrten das Kind getauft haben, ehe es auf der Welt war. Sie nennen mich einen Kranioskopen, und meine ausgestellte Wissenschaft eine Kranioskopie. Allein für erste sind mir alle die gelehrten Wörter zuwider; fürs zweite ist das nicht der Titel der mir gebührt, und der mein Bewerb gehörig bezeichnet.“

Chapter 2: Moving the *Schädellehre* to Paris

Having discussed the foundation of the *Schädellehre* and the extent to which Gall publicized his system to a mainly elite, medical audience in Vienna, I will now turn my attention to the development outside of Vienna. This will start where the last chapter left off – after Gall’s publication in *Der neue Teutsche Merkur* and continue as I trace Gall’s movement from Vienna, throughout Europe, and eventually to Paris. I will discuss the reception to his lectures in these areas as well as Gall’s continued dedication to furthering his system. Furthermore, I will analyze the texts which Gall published in Paris in order to compare them with his outline in *Der neue Teutsche Merkur*. All the while, I will examine and point out the ways Gall tried to spread his system, both during his tour to Paris and once he settled there. During Gall’s physical relocation to Paris, he added a new party to his office, Johann Gaspar Spurzheim, who became extremely influential in the progression and development of phrenology. In this chapter, I will also highlight the entrance of Spurzheim, ending this chapter with the separation of Gall and Spurzheim, and setting ground for the birth of phrenology and its divergence from the *Schädellehre*.

After the publication in *Der neue Teutsche Merkur*, Gall continued to lecture on his system and was joined in 1804 by Johann Gaspar Spurzheim, who assisted him with the dissections during Gall’s public lectures. Spurzheim was born on December 31, 1776 to a farmer in the village of Longvich.⁴⁰ Originally, Spurzheim was educated in the clerical profession, studying Philosophy and Divinity until Treves, the city where he was studying, was overrun by

⁴⁰ Capen, Nahum. *Reminiscences of Dr. Spurzheim and George Combe*. New York: Fowler and Wells, 1881, 88. Accessed November 13, 2010. <http://hdl.handle.net/2027/uc2.ark:/13960/t56d6523v>. Nahum Capen gives an extensive biography and description of the movements and efforts of Spurzheim from his birth and association with Gall up until his death in the United States.

the French army in 1792.⁴¹ He then moved to Vienna, where he met Gall in 1800 and was hired by him in 1804.⁴² Spurzheim remained with Gall as he traveled through Europe and settled with him in Paris in 1807. Together, they submitted a manuscript to the French Institute and worked on publishing 4 volumes, containing both their anatomical discoveries as well as the system which Gall had developed in Vienna. In 1813, Spurzheim departed from Gall's company and headed to Britain, where he developed phrenology as well as extensively published and lectured about this modified version of the *Schädellehre*. Spurzheim made two trips to Britain, and in order to support the spread of phrenology into the United States, he departed from Paris on June 20th, 1832, arriving in August.⁴³ He engaged in many social appointments as well as visited asylums, prisons, and universities upon arriving in the United States until he became sick and passed away in October of the same year as his arrival.

The role Spurzheim played during his collaboration with Gall is hard to distinguish throughout their nine years together, because both sides give themselves more credit than the other does. Deciphering the lines is further complicated by their followers, who, tend to remain loyal and praise one side or the other, and undermine the work of the other party. I will try to distinguish the role each played by showing some of the opposing arguments. After Spurzheim met Gall, Gall was forbidden from lecturing or publishing on his theory while in Vienna due to a decree from Emperor Franz II in December 1801. Although the decree cited various justifications for the prohibition, the most likely reasons were due to opponents' claims that the system was materialistic and the heightened popularity of his system, which I mentioned in the

⁴¹ Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 88.

⁴² Van Wyhe, John. "The History of Phrenology on the Web: Timeline." Last modified December 5, 2001. Accessed February 8, 2011. <http://www.historyofphrenology.org.uk/timeline.htm>.

⁴³ Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 8.

previous chapter.⁴⁴ Because of this decree, Gall was unable to publish the official document fully describing his system in Vienna as he had hoped, which he had already prepared and titled *Lehre über die Verrichtungen des Hirns, und über die Möglichkeit, die Anlagen mehrere Geistes- und Gemüthseigenschaften aus dem Bau des Kopfes, und des Schedels des Menschen und der Thiere zu erkennen*.⁴⁵ The decree actually helped Gall's system spread. Twice as many pamphlets on his system were published in 1802 and the number published doubled the following two years until Gall left Vienna.⁴⁶ But, unable to further publicize in Vienna himself, and with the situation growing more and more adverse for Gall and his system⁴⁷, Gall and Spurzheim left four years after the decree to conduct a lecture tour and expand the *Schädellehre* by continuing his researches on a vast amount of new subjects and visiting many scholars and institutions throughout central Europe. It is important to mention here that Gall was neither forced to leave, nor chased out of Vienna, but instead left by his own free will, and intended on returning to Vienna after his tour.⁴⁸

Gall's tour throughout Europe was extensive, covering many of the major cities throughout the German-speaking areas and lasting for over two years. A constructed map, based on description of Gall and Spurzheim's travels, is depicted in van Wyhe's "The authority of human nature," but there are also written descriptions in other sources of the places they visited

⁴⁴ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 25. Van Wyhe provides examples of reasons for why Gall was forbidden; "the enthusiasm with which Gall's system was discussed, the possibility that some enthusiasts might get carried away, the attendance of ladies, the danger the system might lead to materialism and thereby go against the 'the first principles of morality and religion', but it did not mention atheism. In, *On the functions of the brain and each of its parts, vol.1*, the editor of Gall's biography claims that "his doctrines [were] considered dangerous to religion" (19). For more information discussing possible influences going into the ordering of the decree, see Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 25–26.

⁴⁵ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 25.

⁴⁶ Ibid, 26.

⁴⁷ Ackerknecht states that the atmosphere in Vienna was becoming more unfavorable, citing an example where Johann Peter Frank, one of Gall's "protectors" left Vienna in 1804 to "find freedom in Russia." Ackerknecht, Erwin H. and Henri V. Vallois. *Franz Joseph Gall, inventor of phrenology and his collection*. Translated by Claire St. Léon. Madison: University of Wisconsin Medical School, 1956, 9.

⁴⁸ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 26.

as well as the activities they conducted in each city.⁴⁹ To name a few of the major places, Gall and Spurzheim visited and lectured in Berlin, Dresden, Weimar, Hamburg, Copenhagen, Amsterdam, Düsseldorf, Stuttgart, Heidelberg, Zurich and Bern.⁵⁰ Even though Gall charged for his lectures in order to fund his trip, he was well received, his lectures filled, and his system enjoyed the height of its popularity in Germany while he was lecturing there.⁵¹ “In these travels ‘I experienced everywhere,’ says Gall, ‘the most flattering reception. Sovereigns, ministers, philosophers, legislators, artists, seconded my design on all occasions, augmenting my collection, and furnishing me everywhere with new observations. The circumstances were too favorable to permit me to resist the invitations which came to me from most of the Universities.’”⁵² He was granted many honors throughout the cities he visited, along with these privileged encounters with Germany’s elite, and three commemorative medals were even made in his honor in Berlin.⁵³ Because of the heightened popularity he received amongst Germany’s elite and lay classes, Gall extended his tour, which he had originally only intended to last several months.⁵⁴

Besides the popularity, the lecture tour served as professional advancement for Gall. As Gall remembers, “[t]his journey afforded me the opportunity of studying the organization of a great number of men of eminent talents, and of others extremely limited, and I had the advantage of observing the difference between them. I gathered innumerable facts in the schools, and in the great establishments of education, in the asylums for orphans and foundlings, in the insane hospitals, in the houses of correction, in prisons, in judicial courts, and even in places of

⁴⁹ Van Wyhe himself discusses the places that Gall and Spurzheim visited and constructs a map (28), but a list of the cities can be found in: Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 89–90; and, Gall, *On the functions of the brain and of each of its parts vol. 1*, 20–21.

⁵⁰ Gall, *On the functions of the brain and of each of its parts vol. 1*, 21.

⁵¹ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 26

⁵² Gall, *On the functions of the brain and of each of its parts vol. 1*, 21.

⁵³ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 27.

⁵⁴ *Ibid*, 26.

execution; the multiplied researches on suicides, idiots, and madmen, have contributed greatly to correct and confirm my opinions.”⁵⁵ Gall and Spurzheim had multitudes of engagements and excursions to keep their schedule busy outside of lecturing. In the meantime, they were meeting with many of the top minds of central Europe, including one of those who influenced his system, Johann Wolfgang von Goethe.⁵⁶

It is necessary to state briefly that Gall received much criticism as well as support from the elite.⁵⁷ Goethe, although a supporter and defender of Gall’s system, was himself somewhat hesitant in regard to the extent to which Gall defined his system.⁵⁸ One critic in particular was outspoken in his stance against Gall. Jacob Fidelis Ackermann (1765-1815) was an anatomist in Heidelberg who started his statements against Gall in a book, where he criticized Gall for not “investigating Nature as a romantic *Naturphilosoph*.”⁵⁹ In response, Gall published a paper and headed to Heidelberg in order to contest Ackermann’s claims. During what van Wyhe labels as a personal battle, Gall claimed victory over Ackermann with his skilled dissection and “natural rhetoric.”⁶⁰

The lecture tour was a great opportunity to gain new material and increase their observations and data. Whereas Spurzheim claimed to have helped a lot in making discoveries along the journey, Gall claimed the opposite.⁶¹ Although it is impossible to say, especially for the

⁵⁵ Gall, *On the functions of the brain and of each of its parts vol. 1*, 21.

⁵⁶ Greenblatt, “Phrenology in the Science and Culture of the 19th Century,” 792.

⁵⁷ Oehler-Klein, Sigrid. *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*. Stuttgart and New York: Gustav Fischer Verlag, 1990. In chapter 6, she discusses the conflicts scholars had with Gall’s system in “der Goethezeit.”

⁵⁸ *Ibid*, 213–227.

⁵⁹ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 38.

⁶⁰ *Ibid*, 40.

⁶¹ From Elliotson, *Human Physiology*, 331–332; “Now, [Spurzheim] never gave a lecture; and only obeyed Gall’s orders mechanically in silence, while Gall was demonstrating. Dr. Spurzheim never then pretended to discoveries; and yet all the great discoveries were already made. Gall assured me that the discoveries, both anatomical and physiological, made after he engaged Dr. Spurzheim as his assistant, were merely slight modifications.” Elliotson, a supporter and vindicator of Gall, attempts to give as much credit to Gall while discrediting Spurzheim’s contributions.

sections dedicated to anatomy, it is more plausible that Gall was the main contributor in regards to the system as evidenced by the high level of development exhibited in his letter, which was published two years before Gall met Spurzheim. Spectators to Gall's lectures further commented that it was Gall who lectured the whole time, sometimes conducting the dissections himself, with Spurzheim there to collect funds, occasionally dissect "according to Gall's method," and unpack and hand skulls to Gall when he needed them. These observations corroborated the idea that Gall was the one in charge and making any discoveries during the tour.⁶² To conclude this massive lecture tour throughout central Europe, which started in March of 1805, Franz Joseph Gall and his assistant, Spurzheim settled in Paris, France in October of 1807.⁶³

Despite the popularity that Gall and his system experienced in Germany, which had grown to become prevalent especially amongst artists, who materialized Gall's system through skulls marked with the boundaries of Gall's "organs" or snuffboxes and ladies' fans, the hype did not last long after Gall's lectures ended.⁶⁴ Van Wyhe argues for multiple reasons for the drastic decline in interest within Germany upon Gall's exit. He discusses the impact of the philosophical principles of the *Naturphilosophen* on his system, as well as a conscious effort by Gall to not train any followers or leave his system behind in Germany, due to his desire to be the supreme source of knowledge on the subject.⁶⁵ Van Wyhe depicts Gall as one primarily striving to promote his social standing, and therefore discouraged people from practicing his system.⁶⁶ The concept of the *Naturphilosophen* is probable. Most of those who admired his lectures in Germany had been of an older generation; Goethe, Hufeland, Blumenbach and J.D. Metzger. Ackerknecht wrote that it was only the old generation that appreciated Gall's system. Because of

⁶² Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 28.

⁶³ *Ibid*, 26.

⁶⁴ *Ibid*, 27.

⁶⁵ *Ibid*, 17–42.

⁶⁶ *Ibid*, 37.

his reliance on empirical observation, the limited applications, and the highly scientific versus philosophical description of his system, his ideas were not welcome amongst the younger, “romantic generation.”⁶⁷ It was this younger generation that would lead development in German medicine and “science” for the following thirty years, which corresponded to the time that Gall’s system was ignored in Germany.⁶⁸ This separation between the older and younger generation could also be used to further analyze the separation of Spurzheim, who was part of the younger generation, from Gall.

Van Wyhe argues that Gall’s purpose of touring was to generate elite social status and financial benefit for himself. “If we consider what [his tour] did for Gall’s social and intellectual status and authority, then it was a dazzling success, which is how Gall himself regarded it.”⁶⁹ I want to counter his argument, and argue that it is unlikely that Gall’s sole focus was to “generate elite intellectual status” over publicizing his system based on the fact that Gall did not publish during his tour, but rather that he also sought scientific legitimization for his system.⁷⁰ The flaw in van Wyhe’s argument is the realization that publishing a large multivolume series would have been extremely difficult since Gall was traveling the whole time. Gall showed that he wanted to publish and therefore publicize his system, but had been stymied by the decree, which van Wyhe furthermore cites as a reason why Gall could not publish in Germany.⁷¹ It is important to note that Gall was trying to spread his system, which I have shown through his desire to lecture in both Vienna and Germany as well as publish in Vienna, and will show later when I discuss his publications in Paris. In comparison to Spurzheim though, who tried to reach a much broader

⁶⁷ Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 32.

⁶⁸ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 38.

⁶⁹ *Ibid*, 30.

⁷⁰ *Ibid*, 42.

⁷¹ *Ibid*, 31

audience and therefore adjusted Gall's system to support broad popularization, Gall's desire to reach a lay audience was relatively smaller.

Despite his reasons for not publishing during his tour, an important aspect of the declined response to Gall's system, was that Gall and Spurzheim did not leave behind many tangible materials in the way of books or other publications necessary for continuing the popularity of his system. His main source of publicizing had been lectures. Therefore, besides pamphlets that were published by third parties about his lectures, when Gall and Spurzheim left Germany, so did the means of obtaining information on their system from the primary source. This shows not only the immense influence that lecturing had on spreading Gall's system, but also demonstrates how important written works were for maintaining prolonged interest, especially for one who did not belong to an university or other institution.⁷² The controversies about and reactions to how Gall spread his system (charging for lectures, not publishing, lecturing without membership to an academy or university) demonstrated the absence of an accepted way to develop and disseminate "science" at the start of the nineteenth century, and furthermore that it was "odd" for someone to publicize their findings orally rather than written.⁷³ Therefore, Gall was innovative not only in forming his system by molding many pre-existing ideas and theories for his purpose, but also in the developmental and publication techniques he used for his system.

Having established himself in Paris at the end of the tour, Gall took a key step to legitimize his system as a "science." In 1808 he and Spurzheim submitted a manuscript on the

⁷² Ackerknecht argues that Gall was handicapped in his pursuits because he didn't have a position within "any academic hierarchy," which, along with his charging funds for his lectures, led to him being called a charlatan by his critics in Germany. Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 15. Van Wyhe also contributes claiming that Gall "lacked two proper ingredients to impart proper science [during his tour]: an exclusive audience and non-profit lectures." Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 33.

⁷³ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 41.

anatomy of the brain to the French Institute, which was then “in all of its glory.”⁷⁴ Although Cuvier, who read the manuscript, was a supporter of Gall’s system, their application was turned down for what are shown to be political reasons.⁷⁵ Nevertheless, this demonstrated that Gall desired to broadcast his system as a “science” as well as entertained a scientific, elite audience. Furthermore, the action of submitting the manuscript for scientific recognition was the peak of Gall’s process of developing his system. At this point in time, his system was fully developed and Gall strove to continue refining his arguments as well as spread awareness of his system.

After being rejected by the French Institute, Gall and Spurzheim commenced working on a massive four volume collection, which Gall later reworked into a six volume set. This collection outlined, explained, and defended the theory that Gall had discovered and, with the help of Spurzheim, developed in Vienna as well as on their lecture tour. Originally published in French, Gall and Spurzheim released each volume in series starting in 1810 and the final in 1819. The first two of these volumes focused entirely on the anatomical findings, with the latter two focusing on and developing Gall’s system, the *Schädellehre*. Gall promoted Spurzheim to a collaborator in 1809 with hopes of motivating Spurzheim to continue researches into the fields that Gall had begun once Gall was incapable of doing so himself.⁷⁶ Although the process of composing these volumes was a collaborative process between Gall and Spurzheim, Spurzheim left Gall and Paris in 1813, before the publication of the second volume.

The exact reason why Spurzheim left Gall is unknown, but some scholars believe that it was due to serious disagreements over the system itself.⁷⁷ Interestingly, Spurzheim’s departure

⁷⁴ Gall, *On the functions of the brain and of each of its parts* vol. 1, 22.

⁷⁵ For more on the reasons why the manuscript was refused, consult Gall, *On the functions of the brain and of each of its parts* vol. 1, 22–27.

⁷⁶ Elliotson, *Human Physiology*, 384.

⁷⁷ Tomlinson, *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*, 62–63; Van Wyhe, John. *Phrenology and the Origins of Victorian Scientific Naturalism*. Aldershot and Burlington: Ashgate, 2004, 27–29.

from Gall was not long after he had been made a collaborator, indicating that Spurzheim had ideas for the system that he and Gall could not reconcile.⁷⁸ As became more evident when Spurzheim published without the accompanying name of Gall, Spurzheim had a more optimistic approach to human nature, whereas Gall was often pointed out as being more pessimistic.⁷⁹ Gall is argued to have been “far more interested in laying the foundation of a physiological psychology than the philosophical systemizing and moral reforms advocated by Spurzheim, who Gall complained ‘too frequently deviated from the pure path of observation and...[threw] himself into ideal-metaphysical and even theological reveries.’”⁸⁰ Gall required a certain level of “scientific rigor,” in that he required further investigation and evidence in order to develop and refine his system, but Spurzheim was resistant, favoring “immediate popularization” through social reform application without obtaining more evidence.⁸¹ This argument, which fits with the prevailing mindset of the younger and older generations in Germany, led Zola-Morgan to hypothesize that the disagreement between Spurzheim and Gall focused on “the process of science rather than from disagreements about the doctrine.”⁸² This corresponds to Spurzheim’s desire to speculate and expand the applications of the system without further experimentation in order to publicize on a grander scale, whereas Gall required more research and did not share the dream of mass popularization. Originally, the two had planned on going to Britain together to lecture, but Spurzheim had other ideas. He studied English for six months without Gall’s knowledge, showing his pre-emptive plan to visit Britain without Gall’s company, and within one week of announcing to Gall that he would be going alone, Spurzheim departed Gall’s

⁷⁸ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 29.

⁷⁹ Zola-Morgan, *Localization of Brain Function: The Legacy of Franz Joseph Gall (1758–1828)*, 369.

⁸⁰ Tomlinson, *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*, 62–63.

⁸¹ Zola-Morgan, *Localization of Brain Function: The Legacy of Franz Joseph Gall (1758–1828)*, 371.

⁸² *Ibid*, 371.

company.⁸³ Thus Gall compiled the remaining volumes himself, while Spurzheim ventured to Britain, conducted his own research, and developed a different form of Gall's system more useful to social reform, which he called phrenology.

Because Gall and Spurzheim split up before they published the second volume, Gall had to finish it as well as the remaining two, which focused entirely on developing and explaining his organological system. Unlike the first volume, Gall did not include Spurzheim's name as an author on the remaining three volumes, drawing into question how much of a part Spurzheim played in writing these volumes. Van Wyhe states that Spurzheim's contributions to the volumes were merely to help with notes, as well as to arrange and supervise the construction of the plates, pointing out that the text was completely Gall's.⁸⁴ Gall himself claimed that Spurzheim had nothing more to do than the reference sections.⁸⁵ Therefore, Gall said that the whole composition was solely his work, which Elliotson further corroborated, due to the same style of writing being exhibited throughout all four volumes.⁸⁶ Finally, after he had been prohibited from publishing or lecturing in Vienna, Gall published an extensive work on the system that he had outlined in 1798. This was the first comprehensive publication of Gall's system, complete with words and pictures.

Three years after he had published the final volume in the four-volume set, Gall published a six-volume set. His original multivolume work was expensively priced at 1000 francs⁸⁷, but Gall did not want to cut out any detail of his system and anatomical findings based on price in his original work. He recognized this as a problem and stated in the preface to his revised publication, "the execution of this vast plan, raised the price of my work above the means

⁸³ Elliotson, *Human Physiology*, 384.

⁸⁴ Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 30.

⁸⁵ Elliotson, *Human Physiology*, 334.

⁸⁶ *Ibid*, 384.

⁸⁷ Gall, *On the functions of the brain and of each of its parts vol. 1*, 27.

of most persons, to whom labors ought to prove of the most utility; and I was therefore urged from all quarters to publish an edition, which in its price might come within the reach of the public in general.”⁸⁸ Gall admitted here that publicizing and spreading his system were amongst his aims, and was at this point actively trying to expand his system beyond a restricted scientific elite to a broader, lay audience in Paris, which he had reached in both Vienna and Germany. Whereas the first phase of his “science” had been spent conducting research and development in Vienna, in Paris he was focused entirely on the third phase, characterized by publicizing and refining his system, which he also had worked on while in Germany. Furthermore, Gall entered into the conversation about Spurzheim’s contribution to the four-volume set by stating in his preface, “it is three years since *I* published *my* large work on the anatomy and physiology of the brain.”⁸⁹ Gall’s use of the words “I” and “my” here denote his impression that the work was singularly his synthesis. These singular pronouns refer entirely to Gall, and thus exclude Spurzheim from the picture. Thus, Gall tried to settle the dispute by claiming the responsibility for the publication of the four volumes all for himself.

Along with Gall’s admitted purpose to make his system accessible to a larger audience, there are many ties between the outline Gall published in 1798 and these volumes that he published between 1822 and 1825. The seven basic premises were refined into four major points but still stress that the various faculties were innate and that their seats were within the brain.⁹⁰ It was the activity and development of these faculties and propensities which drove an individual’s actions, and due to the various development of the organs for each individual, there was a unique organization for each unique person, which accounted for the diversity amongst humankind. In

⁸⁸ Gall, *On the functions of the brain and of each of its parts vol. 1*, 53–54.

⁸⁹ The italics were added on my behalf to help emphasize Gall’s use of singular personal pronouns, referring to himself and therefore excluding Spurzheim. *Ibid*, 53.

⁹⁰ *Ibid*, 55.

the third, fourth, and fifth volumes of this set, Gall explained each of his 27 organs, including their location and how he located them based on both human and animal observations. In some of his descriptions, he even formed links to his ideas of social reform. For example, when Gall discussed the organ labeled “carnivorous instinct; disposition to murder,” he made a clear connection between hyperactivity of this organ and the desire to commit homicide.⁹¹ At the start of the chapter dedicated to this organ, he discussed how it was important for jurists and legislators to understand his system because if they did, then they would regard and punish criminals differently.⁹² The argument for penal reform was mentioned in this section as well as in the first volume, where Gall dedicated a whole section to social reform, which included topics on insanity, criminals, and education.⁹³ He even took it upon himself to offer suggestions for prison reform, treatment of the insane, and more specific examples such as how to punish and rehabilitate thieves.⁹⁴

His suggestions for all of these reforms were based on his new outlook on the organization of the brain and its impact on human behavior. Being enlightened to the functioning of the brain, Gall argued for criminality and insanity to be considered as a disease of the brain, instead of moral corruption, and thus a malady that could be treated. In the fifth and sixth volumes, Gall elaborated on this philosophy behind his system and what it meant for the nature of humans. This psychology and what his physiology of the brain meant for human nature was one aspect of Gall’s argument for considering his system as a “science.” He also confronted criticisms that were raised against his system, such as materialism and fatalism, as well as

⁹¹ Gall, *On the functions of the brain and of each of its parts vol. 4*, 74.

⁹² *Ibid*, 74–75.

⁹³ Gall, *On the functions of the brain and of each of its parts vol. 1*, 55; In section 5 (250–253), Gall discussed the implications his system has for different types of social reform. Amongst these, he touched upon education, punishment, houses of correction and prisons, and madness.

⁹⁴ Gall, *On the functions of the brain and of each of its parts vol. 4*, 136.

denounced physiognomy, just as he promised in his outline. Thus, just as Gall laid out in his outline, he described the depth and philosophy of his system and included the applications his new way of understanding the functions of the brain had on ideas of social reform.

Unlike his outline though, Gall spent some time going over his anatomical discoveries further demonstrating his desire to label his system as “science.” Gall did not include any of these findings in his outline, probably due to the fact that he had not located the majority of them by 1798. Although he set up his volumes with a description of anatomy first and then moved on to his physiology, and therefore, the system of *Organologie*, his research was conducted in the opposite direction. Because Gall did not believe structure dictated function, he sought for physiology first and then anatomy.⁹⁵ His theories of mental faculties and propensities came first, and then he attempted to confirm these ideas through dissection and explanations of anatomy.⁹⁶ Therefore, his dissections served merely to prove his ideas, or at least, his work with anatomy was guided by his theories, which were by this point a “foregone conclusion” to Gall marking one point of contention amongst his critics.⁹⁷ Despite the presence of the anatomy in his volumes, the vast majority of the time was spent explaining the basis and application of his system in his first volume, going further in depth in each consecutive volume and including justification and evidence for each of his claims.

Besides working on the publications, Gall established a practice in Paris and prospered as he had in Vienna, giving lectures on his system. As a physician, he had many notable patients, such as a Duke Decazes, Benjamin Constant, Saint Simon, Prince Metternich, the Count Capod’Istria, and the Count Potocki, who had a medal made in remembrance of Gall’s service to

⁹⁵ Lesky, “Structure and Function in Gall,” 299.

⁹⁶ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 20.

⁹⁷ Lesky, “Structure and Function in Gall,” 308.

him.⁹⁸ In 1819 he began lecturing on his system and anatomical discoveries strictly for medical students at the Minister of the Interior's request.⁹⁹ These lectures were massively popular, with a regular audience of between 200 and 300 observers, such that the lecture room was filled half an hour before the lectures began.¹⁰⁰ Although he remained in Paris for nearly the remainder of his life, he did journey to Britain in 1823 to give a brief series of lectures.¹⁰¹ Besides this trip, Gall enjoyed the remainder of his life in Paris where his death was greatly lamented.¹⁰²

Spurzheim, on the other hand, had just begun what would be his contribution to the development of phrenology with his departure for Britain. As Greenblatt puts it, "Spurzheim's break with Gall in 1812 amounted to a geographical and intellectual break in phrenology's subsequent history."¹⁰³ While Gall remained in Paris, where his system did not fully catch on or experience wide popularization, Spurzheim took the system to Britain, and after some manipulation, developed it into the social phenomenon that is recognized today as phrenology. In the next chapter, I will follow Spurzheim to Britain, leaving Gall and his contribution to phrenology behind in Paris. Although Gall will be mentioned throughout the following chapters, it will be mainly to point out the discrepancies between Gall's original system and Spurzheim's phrenology, in order to mark the development of phrenology as a social phenomenon.

⁹⁸ Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 10.

⁹⁹ Gall, *On the functions of the brain and of each of its parts vol. 1*, 27.

¹⁰⁰ *Ibid*, 28.

¹⁰¹ Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 794.

¹⁰² "His death gave rise to a succession of eulogiums and attacks in the French newspapers that had scarcely every been paralleled, and public sentiment was warmly and loudly expressed in his favor." Gall, *On the functions of the brain and of each of its parts vol. 1*, 29.

¹⁰³ Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 794.

Chapter 3: Spurzheim and the Development of Phrenology

This, the third chapter, will focus entirely on the development of phrenology through the hands of Spurzheim and his successors in Britain and the United States. I will start off by briefly explaining the situation in England before Spurzheim arrived. Afterward, I will discuss Spurzheim in depth, focusing on his popularization techniques and comparing his publications with those of Gall in order to create a separation between the system Spurzheim spread and Gall's system. Specifically, I will point out how Spurzheim morphed the *Schädellehre* into phrenology through a change in language and terms used, a reorganization of Gall's organs, a push for increased specializations within phrenology, an acceptance of physiognomy, and finally a shift to an optimistic, rather than pessimistic or realistic, view of human nature. Furthermore, I will demonstrate that Spurzheim made these changes in order to make his system popular on a wider scale than Gall achieved or imagined, and did so because he was more focused on obtaining the benefit of a popularizer than a physician. After separating Spurzheim's phrenology from Gall's *Schädellehre*, I will offer a few more examples, specifically George Combe and the Fowler brothers, to show how phrenology continued to change beyond Spurzheim, and will conclude this chapter laying out phrenology's overall geographical and chronological trajectory through 1967, when the last phrenological society was closed and phrenology had long before been discredited amongst scientists.

Gall had not ventured to Britain before Spurzheim went there in 1814. This meant the general public had not been exposed to lectures or firsthand material on Gall's system. Instead, everything had been passed on through pamphlets or hearsay from traveling academics. At first, the system had been positively spoken of, but by the time Spurzheim reached Britain, Gall's

system was viewed as false.¹⁰⁴ Besides general knowledge of the system, many of the specifics were not known, including Spurzheim's role in the development and publication of Gall's system.¹⁰⁵ Spurzheim had an uphill battle to fight since his name wasn't welcomed as warmly as Gall's was within Paris and central Europe, and because the public had grown weary of theories such as *Mesmerism*, which had been discredited in England.¹⁰⁶ At the same time, the terrain was neutral in regards to him, which allowed Spurzheim to change the system how he saw fit. In fact, Gall's works were not translated into English until 1835, and therefore the vast majority of Spurzheim's English audience was unaware of what Gall had accomplished in Europe, and how Spurzheim altered and used it.¹⁰⁷ This language and geographical barrier granted Spurzheim the ability to start anew, where no one knew about the beginning and development of Gall's system in Europe. It allowed him to distort the reality of his role in the development of the system and contribution to Gall's four-volume work, which was in the middle of being published at the time. This marked the difference in how Gall and Spurzheim founded their systems. Whereas Gall developed his system from start to finish, Spurzheim did not use the same path. Taking what he needed from the *Schädellehre*, Spurzheim exploited what was there for further application to human nature. Unlike Gall, Spurzheim's development had two aspects, adjustments and popularization, which he enacted concurrently.

Although he departed Paris and Gall in 1813, Spurzheim did not arrive in England until March 1814, due to a brief stop in Vienna to complete his medical degree.¹⁰⁸ Just as Gall had done in Germany, Spurzheim planned a lecture tour throughout England, Ireland, and Scotland in

¹⁰⁴ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 29.

¹⁰⁵ *Ibid*, 29.

¹⁰⁶ Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 100: Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 29.

¹⁰⁷ Tomlinson, *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*, 75.

¹⁰⁸ Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 99.

order to publicize and spread his modified version of Gall's system. Spurzheim's lectures in London did not experience the same amount of popularity as Gall's had in Germany.¹⁰⁹ At first, Spurzheim targeted a medical audience, lecturing as he had seen Gall lecture, but this was not popularly received.¹¹⁰ Instead of lecturing on Gall's system, Spurzheim wanted to forge a larger role for himself in the development of the system, and thus lectured on "the physiognomical system of Drs. Gall *and* Spurzheim."¹¹¹ By including his name in the title of these lectures, Spurzheim tried to establish himself as an authority on the system, parallel to Gall, which marked the first major step of Spurzheim changing Gall's system and developing his own. Despite the initial lack of popularity for his lectures, Spurzheim continued to lecture and traveled on further to Bath, Bristol, Cork and then Dublin.¹¹² As he continued to lecture, and word of his ideas spread, his lectures were greeted with greater success.

The next stop on his tour was Edinburgh, where one of his largest critics, John Gordon, resided, lectured on anatomy, and published articles in the *Edinburgh Review* as well as *Quarterly Review*, denouncing Spurzheim and Gall's system.¹¹³ Just as controversy had helped Gall publicize the *Schädellehre*, especially in Vienna and Germany, the controversy that Gordon's publications created helped spread awareness of Spurzheim's lectures. In Edinburgh, Spurzheim confronted the published article in the *Edinburgh Review* and lectured as he had throughout England and Ireland but did not draw attention to Gordon who was in attendance. This lecture was essential to legitimizing Spurzheim and his system, and therefore increased his

¹⁰⁹ "The effect in its favor, however, was not so general as might have been expected. When a course of lectures was delivered, not more than forty auditors were present; neither did a second course attract a more numerous circle." Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 100.

¹¹⁰ Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 303.

¹¹¹ Italics were added on my behalf for emphasis. Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 29.

¹¹² Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 103.

¹¹³ *Ibid*, 103.

number of followers in Great Britain substantially.¹¹⁴ Spurzheim continued his lectures, traveling to Dublin and Cambridge, where he further confronted critics and converted more spectators into followers.¹¹⁵ In 1817 he returned to Paris after lecturing one more time in London.¹¹⁶

While Spurzheim lectured throughout Great Britain from 1815 to 1817, he also published a great quantity of pieces in English. Publishing achieved two goals; firstly, it kept people in Great Britain interested in Spurzheim's system by providing them with a tangible, long-lasting representation of his system while allowing him to gain enduring credit and recognition for the system he was spreading; and secondly, it allowed Spurzheim to formalize the separation between his system of phrenology and Gall's system of the *Schädellehre*. In 1815, he published his first work titled *The physiognomical system of Drs. Gall and Spurzheim*, as a condensed version of Gall's four volume series. Instead of writing in French, Spurzheim wrote in English, reflecting his desire to spread phrenology to a new English audience.¹¹⁷

The years of 1825 and 1826 were Spurzheim's busiest years in terms of publications, which coincided with his return to Britain. Interestingly, Spurzheim only published while he was in Britain and in the English language, showing the dedication to his new intended audience. In those two years alone he published seven pieces, some of which are titled *Phrenology, in connection with the study of physiognomy, Phrenology, or the doctrine of the mental phenomena, A view of the philosophical principles of Phrenology*, and *Education: its elementary principles, founded on the nature of man*. Some of these works, such as *Education*, were published in multiple editions.

¹¹⁴ Capen, *Reminiscences of Dr. Spurzheim and George Combe*, 104.

¹¹⁵ *Ibid*, 105.

¹¹⁶ Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 334.

¹¹⁷ "I here confine myself to the publication of outlines of our investigations, in order to give the English reader a correct view of our general doctrine, and to enable him to judge of its solidity and importance." Spurzheim, J. G. *The physiognomical system of Drs. Gall and Spurzheim*. London: Baldwin, Cradock, and Joy, 1815, Preface, vii. Accessed January 19, 2011. <http://hdl.handle.net/2027/njp.32101068788965>.

The amount of works published by Spurzheim between 1825 and 1826 demonstrated two motives – the desire to broaden the audience for phrenology, as well as the move toward various specializations as evidenced by the diverse fields his titles incorporated. Whereas the four volume set published by Gall and Spurzheim was arguably for a specialized audience due to the pure size, cost, and immense detail, the topics that Spurzheim chose to focus on, such as education and philosophy, demonstrated the variety of specialized audiences he was reaching out to for each individual publication. This specialization and mass publication strategy marked another of Spurzheim’s attempts to alter Gall’s system and form phrenology, a term which he already began to use, by showing a shift in Spurzheim’s focus to a broader audience than Gall had targeted. Spurzheim was moving far beyond a specialized, medical audience – he wanted to encompass both more specialties and classes below the upper elite.

Spurzheim’s desire to reach classes below the upper elite through multiple publications corresponded to an increase in reading in England in the 1820s.¹¹⁸ The large number of publications produced by Spurzheim fit under the “popular science” term that Bernard Lightman uses in his study of the relationship between the popularization of “science” and publication strategies in nineteenth century Britain, which he claims were “aimed at audiences defined by the new social and intellectual divisions of the industrial age.”¹¹⁹ At the end of the 1830s, the literacy rate was roughly 50%, and by the turn of the century, the number of illiterate Britons was as low as 1%. Therefore, many publishers were trying to reach the new audience of readers, which was not just characterized by an increase in numbers, but a change in the “composition.”¹²⁰ This new audience of readers included members of the middle class as well as the upper working class.

¹¹⁸ Lightman, *Victorian Popularizers of Science*, 18.

¹¹⁹ *Ibid*, 18.

¹²⁰ *Ibid*, 18.

Spurzheim's publications were most likely targeted at this audience, and as will be discussed later, this audience had a particular interest in phrenology and its philosophy.

Looking generally at the style Spurzheim used in his publications, we can further see the effort on his behalf to separate his ideas from Gall's. Although most of the comments Spurzheim made were similar, if not identical to those made by Gall in the four and six volume series, the distinction between Spurzheim and Gall becomes much more apparent.¹²¹ Throughout his texts he used phrases like "to *me*" in such a way to create a discontinuity between what he wrote and what had been said previously by Gall. Also, the singularity one infers from the use of "*I*" instead of "*us*", which Gall used in the first couple volumes of the six volume series, implies Spurzheim's views on phrenology differed from Gall's, and Gall recognized it as well. In fact, in the preface to his first piece of work published separately from Gall, Spurzheim stated, "this book itself will show how much *I* have improved *our* doctrine in the last few years, during which nothing else has been published on the subject."¹²² Here Spurzheim was not directly attacking Gall, but his statement gave off a condescending tone directed at Gall. Spurzheim confronted Gall for not continuing to publish while at the same time trying to point out improvements he made in order to gain recognition for his contribution to phrenology.¹²³ Although Gall and Spurzheim never encountered each other after their split, they engaged each other often through

¹²¹ Gall actually accused Spurzheim of copying 246 pages of the four volume series into his own publications. Elliotson, *Human Physiology*, 386.

¹²² Italics added by the author for emphasis. Spurzheim, *The physiognomical system of Drs. Gall and Spurzheim*, Preface, vii.

¹²³ The first two volumes of the series were published in 1810 and 1812, which was before Spurzheim departed from Gall's company. The next two volumes were published in 1818 and 1819 and Gall's six volume set wasn't published until 1822. Thus, they came after Spurzheim published his piece in 1815. For more instances where Spurzheim credits himself with Gall, or takes credit from Gall see the section in Elliotson, *Human Physiology*, where Elliotson discusses phrenology.

written media, especially on Gall's behalf who did not approve of Spurzheim's actions.¹²⁴ In fact, when Gall was on his deathbed, Spurzheim was not allowed to see him.¹²⁵

Beyond claiming certain discoveries for himself and trying to distance himself from Gall, Spurzheim remodeled Gall's system to create phrenology through a change in the language used to describe the system. Whereas Gall had denounced the use of the terms "*Craniology*" or "*Phrenology*" for his system, Spurzheim adopted them. Dr. Thomas Forster was the first to coin the term "*Phrenology*" in his 1816 publication on the system in London, *Sketch of the Phrenology of Gall and Spurzheim*.¹²⁶ Despite this, Spurzheim takes the credit for the name himself.¹²⁷ What is interesting to note, was that Spurzheim never used the same term for Gall's system that Gall did, and in fact, chose two terms that Gall did not approve of. His first phrase was "the *physiognomical system*", which made a connection to physiognomy, which Gall openly denounced. The second term, "*Phrenology*," was another that Gall did not condone using. Besides the name of the system, Spurzheim also changed the names of the organs. Whereas Gall used multiple words and phrases in order to label each of his organs, Spurzheim transformed the labels into agreeable, one word names. For example, the organ originally described as "*carnivorous instinct; disposition to murder*" by Gall, was relabeled by Spurzheim as "*destructiveness*." Another example was the organ of "*acquisitiveness*," which Gall had named

¹²⁴ "[Gall bemängelte], daß die von diesem vorgenommenen sprachlichen Änderungen in der Fakultätsbezeichnung zugleich eine inhaltliche Abweichung von den ursprünglichen Bedeutungen kennzeichnen." Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 328.

¹²⁵ Elliotson, *Human Physiology*, 386.

¹²⁶ "In 1816 I [Dr. Thomas Forster] published my *Sketch of the Phrenology of Gall and Spurzheim*, London 1816:- a name which the science has never lost." Elliotson, *Human Physiology*, 386. Also noted in The History of Phrenology on the Web – Timeline. <http://www.historyofphrenology.org.uk/timeline.htm>.

¹²⁷ "In extending my views, I found it necessary to change the name again. I have chosen that of Phrenology, which is derived from two Greek words: φρην-mind, and λόγος-discourse: and I understand by it, the doctrine of the special phenomena of the mind, and of the relations between the mental dispositions and the body, particularly the brain." Spurzheim, J. G. *Phrenology, or the doctrine of the mental phenomena 1st ed., vol. 1*. Boston: Marsh, Capen, and Lyon, 1832, 12. Accessed February 2, 2011. <http://hdl.handle.net/2027/mdp.39015022476975>.

“sense of property, instinct of providing, covetousness, propensity to steal.”¹²⁸ Gall utilized multiple terms in order to demonstrate his “inexact understanding of the functions of the organs” and discouraged using single terms because of the certainty that it assumed.¹²⁹ Therefore, Spurzheim was once again going against what his previous master had preached in order to separate himself and his system from that of Gall. But separation was not the only goal of renaming the organs.

Part of the reason for changing the names was due to the fact that Spurzheim did not believe any of the faculties were inherently bad. Gall recognized that he was criticized for admitting negative faculties in man, but stood by his decision.¹³⁰ Spurzheim openly spoke out against this aspect of Gall’s system and stated that he was of the opposite opinion – “there are no evil faculties, and bad actions are due to a diseased faculty, not a normally functioning one.”¹³¹ This disagreement in philosophies was most evident for the organ of “*Würgsinn, murder, the wish to destroy.*” The organ of *murder*, as Gall named it, did not please Spurzheim, who changed the name to *destructiveness*. For Gall, the word murder was not to be taken as the act of killing another human. Killing another human was homicide and Gall drew a line in order to distinguish between the two terms.¹³² He did not want to change the name of the organ in order to make it sound better to his audience. For Gall, it was the organ or murder, and he actually reprimanded

¹²⁸ The comparison of terms used to describe the organs came from Gall, *On the functions of the brain and of each of its parts vol. 4*, and, Spurzheim, J. G. *Outlines of Phrenology*. Boston: Marsh, Capen, and Lyon, 1832.

¹²⁹ Van Wyhe, “The authority of human nature: the *Schädellehre* of Franz Joseph Gall,” 23.

¹³⁰ “I am bitterly reproached for admitting in man, innate evil inclinations and propensities to injurious acts; and my antagonists especially, never fail to remark, that, among these evil inclinations, are found the propensity to theft, and the propensity to murder.” Gall, *On the functions of the brain and of each of its parts vol. 1*, 211.

¹³¹ “Dr. Gall is disposed to admit wicked propensities. He says, that man must submit to the laws of creation in regard to moral as in regard to physical evil; that no one can say he is without temptations; and that all thoughts and inclinations are not innocent or virtuous... I am intimately convinced that no faculty in itself can be bad, and that all the innate powers of man have some aim; that everyone is necessary; that none leads inevitably to evil but that each may produce abuses.” Spurzheim, J. G. *A view of the philosophical principles of Phrenology*. London: Treuttel, Wurtz, and Richter, 1845, 133. Accessed November 20, 2010. <http://hdl.handle.net/2027/ucl.b3419753>.

¹³² “But never, as some of my opponents, with equal assurance and folly, have sedulously endeavored to make people believe, never, in speak of the *instinct of murder*, did I mean thereby, a propensity to *homicide*.” Gall, *On the functions of the brain and of each of its parts vol. 4*, 106.

Spurzheim's choice in renaming it.¹³³ Changing the names of faculties from “*carnivorous instinct; disposition to murder*” or “*sense of property, instinct of providing, covetousness, propensity to steal*” to “*destructiveness*” and “*acquisitiveness*” respectively, made it easier for followers to remember the organs as well as gave phrenology a more positive outlook on human nature, which was key for Spurzheim to make his system appeal to a broad audience.

Another change Spurzheim made to Gall's system, was to increase the number and change the organization of the organs.¹³⁴ In Gall's publications, he located 27 distinct organs, but recognized that there were most likely more organs which he did not identify due to leftover space in the cerebral hemispheres that he did not assign to an organ.¹³⁵ He even described the “*sense of order*” and “*sense of time*” but he did not have enough empirical evidence to localize them to a specific section, despite his belief of their existence. Therefore he did not include them in his list.¹³⁶ Spurzheim, on the other hand, expanded the original 27 into 35 separate organs.¹³⁷ Whereas Gall required a certain amount of evidence in order to justify the presence of a given organ, Spurzheim was more speculative about it, reflecting the different philosophies of the two. His speculative identification of organs was present most noticeably in the organs of “*hope*”, “*marvelousness*”, “*conscientiousness*”, “*size*”, “*weight*”, “*order*”, and “*time*.”¹³⁸ In Gall's and most of Spurzheim's writings, evidence was provided in the description of the organs to justify its existence and location. For the previously mentioned organs, there was no justification. Rather, Spurzheim merely discussed their function and then designated a location for them. He

¹³³ “The propensity to destroy, or destructiveness, as Dr. Spurzheim calls it, gives a too general and extensive signification to the carnivorous instinct.” Gall, *On the functions of the brain and of each of its parts vol. 4*, 106.

¹³⁴ For a structured display of Gall and Spurzheim's organs refer to the appendix.

¹³⁵ Gall only accounted for two-thirds of the cerebral hemispheres with his organs. Critchley, Macdonald. “Neurology's debt to F. J. Gall (1758-1828).” *British Medical Journal* 2 (1965): 775–781, 777. Accessed October 22, 2010. www.bmj.com.

¹³⁶ Elliotson, *Human Physiology*, 350.

¹³⁷ A complete listing of the organs as identified and named by Gall and Spurzheim can be found in Gall, *On the functions of the brain and of each of its parts vol. 1*, 41–42.

¹³⁸ Elliotson, *Human Physiology*, 379.

provided no evidence, from either humans or animals, for their presence.¹³⁹ Therefore, Spurzheim took a step that Gall would not and located specific functions to the brain that he had no evidence for.

As for the organization of the organs, Gall split them into two different classes; those shared by animals and man, and those special to man. Spurzheim on the other hand rearranged them into a hierarchical system beyond Gall's two categories. First, the faculties were split up into two different "orders" - one for "*feelings, or affective faculties*" and the other for "*intellectual faculties*", which Spurzheim designated as representing the difference between "soul and spirit;- moral and intellectual faculties;- understanding and will;- heart and head."¹⁴⁰ Each *order* was split up into multiple "*genera,*" with the first *order* having two ("*propensities*" and "*sentiments*"), and the second having three ("*external senses*", "*perceptive faculties*", and "*reflective faculties*").¹⁴¹ Although he did not split them up further in *Outlines on Phrenology*, Spurzheim stated that the each *genus* could be broken down into several "*species,*" which further had multiple varieties.¹⁴² Despite the more specific classifications, Spurzheim did not separate the faculties based on their relevance to man and animals. He did recognize the difference though. The *propensities*, for example, were all common to both man and animals, but the *sentiments* were a mixture of faculties common to both man and animals, as well as faculties special to man.¹⁴³ Implementing a more structured hierarchy allowed Spurzheim to add his own touch to Gall's system, revamping it to appear more organized and therefore more legitimate despite the speculative nature of some of his identified faculties.

¹³⁹ Spurzheim, *Outlines of Phrenology*, 59–68.

¹⁴⁰ *Ibid*, 20.

¹⁴¹ *Ibid*, 24–73.

¹⁴² *Ibid*, 20–21.

¹⁴³ *Ibid*, 20.

A large change in phrenology's philosophy, compared to the *Schädellehre's*, was the outlook on human nature and the perfectibility of man. More specifically, Spurzheim believed that man had the ability to alter the activity and organization of the faculties through mental exercise and education, whereas Gall believed that it could be done, but only to a limited extent. Therefore, the extent to which their system was applicable to the rehabilitation of criminals and the education of the classes was more progressed for Spurzheim than Gall. Both Gall and Spurzheim placed value on education on rehabilitating and preventing crime. They defined education as exercising the moral faculties by putting them into action, and, "exercise must be proportionate to the innate dispositions, too little or too much does harm, but applied in a proper degree, it makes the organ increase in size, modifies their internal constitution, and produces greater activity and facility."¹⁴⁴ Exercise of the moral faculties was thus the key to rehabilitation. Once the organs that were overactive had been identified, the other organs could be exercised and the problem organs ignored so that the proper balance of activity in all of the organs was once again achieved.

The extent of changing the balance of activity in the organs was a matter of contention between Gall and Spurzheim though. Gall believed there was a limit – "the hope of a constantly increasing improvement of our species is a pleasing and animating sentiment. But, alas! The laws of organization and the records of history, destroy the illusions of the metaphysicians."¹⁴⁵ Although Gall recognized and praised the ability to change the level of activity of the organs, he believed that the organization of the faculties and thus the character of man could never be ultimately perfected. "The moral perfectibility of the human species is confined within the limits

¹⁴⁴ Spurzheim, J. G. *Education: its elementary principles, found on the nature of man*. New York: Fowler and wells, 1848, 132. Accessed February 2, 2011. <http://hdl.handle.net/2027/nyp.3343307597886>.

¹⁴⁵ Gall, *On the functions of the brain and of each of its parts vol. 6*, 281–282.

of his organization.”¹⁴⁶ Man and his faculties, in his opinion, had existed in the same organization throughout history and because of this psychology, along with his physiological reasoning of the faculties, it was illogical to believe in the progression of human nature.¹⁴⁷

Spurzheim, on the other hand, had a more optimistic view on the ability to change the organization of the faculties, and thus the perfectibility of man. Besides Spurzheim’s hierarchical system, the moral faculties of the brain were divided into two different categories, one of which belonged to both man and animals, and the other which resided only in the human brain. It was Spurzheim’s belief that the animal faculties were to blame for the problems of society. The organs of *combateness*, *destructiveness* and *covetiveness* all fell into the category of animal faculties. Spurzheim encouraged people to strive in exercising the faculties “proper to man” in order to develop them while at the same time restraining from activities that would develop and exercise the animal faculties.¹⁴⁸ This followed the same principle of education, except that Spurzheim seemed to take exercise a bit further than re-establishing the balance necessary for normal, everyday functioning. “As the predominance of the animal faculties is the principal cause of human misery, their energy must, by all means, be diminished.”¹⁴⁹ Spurzheim further advocated the development of the human faculties, but strongly incriminated the animal faculties as the cause of human misery. Through calling for their energy to be diminished, he not merely called for their level of activity to be kept in balance with the other faculties, but rather suggested that the level of activity should be brought to the lowest level possible, if not even rendered inactive. It seems that Spurzheim believed inactivating the animal faculties would diminish, if not eliminate, human misery, thus projecting humans into a state of perfection, whereas Gall

¹⁴⁶ Gall, *On the functions of the brain and of each of its parts* vol. 6, 287.

¹⁴⁷ Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 28.

¹⁴⁸ Spurzheim, *A view of the philosophical principles of Phrenology*, 182

¹⁴⁹ *Ibid*, 183.

believed that humans would always suffer from these faculties.¹⁵⁰ This difference allowed Spurzheim to promote a more optimistic view with phrenology, rather than the more pessimistic view of Gall's system.

As I have demonstrated so far, Spurzheim attempted to increase the specialization of his system, changed the language used to describe his system and the organs, increased the organization and number of the organs, and argued for the perfection of man through physiological and psychological ideas in order to separate his system from Gall's, make his system more acceptable for a wider audience, and popularize his system beyond what Gall had accomplished. There was one more aspect to Spurzheim's system that allowed him to do this, and that was the connection he formed between phrenology and physiognomy. As mentioned in the first chapter, physiognomy was popular throughout Europe and Britain at the end of the eighteenth and start of the nineteenth century. Therefore, Spurzheim would have gained immediate recognition and popularity by associating his system with physiognomy.¹⁵¹ Gall was aware of the already apparent connection between his system and physiognomy, but had tried to combat it.¹⁵² This connection was mainly due to the principle that one could use the shape of the skull in order to determine the shape of the brain and therefore, characteristics of an individual's personality. He tried to argue against this being considered physiognomy because only the brain was the seat of the soul, and since he "proved" that the skull took the same shape as the underlying brain, no other part of the body, like hands, could be used to determine properties of

¹⁵⁰ "Men always have been, and always will be inclined to all sorts of perverse actions; they have always been besieged by temptations within and without; they have always been, and always will be, tormented by carnal desires, covetousness, ambition, pride, &c." Gall, *On the functions of the brain and of each of its parts vol. 1*, 212.

¹⁵¹ Pearl, *About Faces: Physiognomy in Nineteenth-Century Britain*, 186.

¹⁵² "Others imagine that my researches on the functions of the individual cerebral parts, and on the inferences to be drawn from a certain form of head, are of the same nature as those of the physiognomists. There is, however, absolutely no reaction between the two." Gall, *On the functions of the brain and of each of its parts vol. 5*, 261. Gall even presents a similar article back in his outline; "der Gegenstand meiner Untersuchung ist das Hirn; der Schädel ist es nur in so fern, als er ein getreuer Abdruck der äußern Hirnfläche ist, und ist folglich nur ein Theil des Hauptgegenstandes." Gall, *Der neue Teutsche Merkur*, 330.

the faculties.¹⁵³ Gall further claimed that unlike his system, physiognomy was not guided by “knowledge of anatomy and of physiology” and that physiognomists had been unable to produce a single proof.¹⁵⁴ Therefore, Gall used the act of reading bumps on the skull as a minor part of his system, and focused on developing a system of *Organologie* which was limited to the anatomy and physiology of the brain.¹⁵⁵

Spurzheim was of a different opinion, and immediately with his first publication, attempted to forge a connection between his system and physiognomy by calling his system a “*physiognomical system*.” Later he published his work, *Phrenology, in connection with the study of physiognomy*, which was dedicated to strengthening the bond between phrenology and physiognomy, which Spurzheim took as an opportunity to define physiognomy in his own terms. In the introduction, Spurzheim vaguely defined physiognomy as, “knowledge of the external signs which proclaim internal qualities,” so that a connection between the study of nature and physiognomy, let alone phrenology and physiognomy, could be denied.¹⁵⁶ He later mentioned that the faculties of the brain exhibit themselves in “*physiognomical sign*”, which could be seen “in the size and organic constitution of the cerebral parts.”¹⁵⁷ For Spurzheim, physiognomy was a practical application of phrenology, and thus he placed a larger emphasis on skull readings than Gall.¹⁵⁸ Along with the increased reliance of skull readings, Spurzheim allowed the ancient four humors (yellow bile/choleric, black bile/melancholic, blood/sanguine, and phlegm/phlegmatic)

¹⁵³ Gall, *On the functions of the brain and of each of its parts vol. 5*, 263–264. Gall also makes an argument in his outline based on “good” not having the same appearance across multiple species, and therefore physiognomy is fallible; “Denn finde ich zum Beispiel am gutmuthigen Esel nicht eben das Merkmal wie am gutmuthigen Hunde, und an dem nicht so wie am gutmuthigen Hahne oder Philosophen, und zwar nicht an jedem an der nämlichen Stelle; so hat ein Zeichen keinen Werth für mich, weil ich in den Naturwerken keine Ausnahme annehme.“ Gall, *Der neue Teutsche Merkur*, 331.

¹⁵⁴ Gall, *On the functions of the brain and of each of its parts vol. 5*, 261.

¹⁵⁵ Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 8.

¹⁵⁶ Spurzheim, *Phrenology, in connection with the study of physiognomy*, 177.

¹⁵⁷ *Ibid.* 183–184.

¹⁵⁸ *Ibid.* 186.

to gain influence in phrenology, giving these temperaments an important influence on character diagnosis.¹⁵⁹

The connection between phrenology and physiognomy was noticeable in one more aspect of Spurzheim's system. Whereas models of the faculties based on Gall's system had been represented on a skull, Spurzheim's organization was shown on the face and naked scalp of a human bust. Instead of the depictions of Gall's system on skulls, which often were renditions of actual specimens, Spurzheim's image of the head was a "more charismatic and less technical representation, more palatable to lay audiences, and more easily applied to head readings."¹⁶⁰ Changing this display from a skull to a head made it easier for viewers to locate specific organs on the scalp, and therefore make their own observations and judgments in everyday situations as people had learned to use the theories of physiognomy. The ability to see where the organs resided with respect to the shape of someone's head, aided practitioners of phrenology in connecting the outward signs with the underlying organs, a necessary step to forming the link between the physiognomical skills that many people already had with the phrenological theories.

Spurzheim's actions to rename organs and restructure the organization of the faculties enabled him to form a system that had a much more optimistic tone than the *Schädellehre*. Furthermore, he paired this restructuring with a philosophy conducive to the perfectibility of human nature, which only aided his pursuit to make phrenology an optimistic "science." Adding the connection to physiognomy helped initiate his audience to phrenology, because it formed a bridge between what they were already familiar with to the new theories that Spurzheim was spreading. All of these changes that Spurzheim made were necessary to aid him in his pursuit to argue for phrenology's application in social reform as well as for a large push in popularization.

¹⁵⁹ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 15–17; Spurzheim, *Outlines of Phrenology*, 3.

¹⁶⁰ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 34.

Therefore, phrenology exuded an ideology of human nature useful for popularization and social reform that was more liberal than its predecessor, which had focused on scientific investigation.¹⁶¹

Spurzheim's phrenology became popular within many audiences. Part of the elite class approved of it due to the applications of social reform, especially those for mentally handicapped patients and criminal rehabilitation.¹⁶² For members of the working class and "aspiring middle class professionals," the implications phrenology had for upward mobility into higher socio-economic classes caught their attention.¹⁶³ Furthermore, whereas Gall did not openly advocate new people practicing his system due to the many difficulties,¹⁶⁴ Spurzheim promoted his system as a "science" able to increase professional status. In fact, he claimed it to be a "premier short-cut science," which one could use to "quickly and easily step to the forefront of scientific status."¹⁶⁵ Thus, Spurzheim was much more open with who he promoted to practice his system than Gall was. Through Spurzheim and some of his dedicated followers' actions, phrenology grew wide acclaim throughout lay audiences, such that Spurzheim's second lecture tour was much more successful.¹⁶⁶

Although Spurzheim preached about the implications phrenology had for social reform, his main goal was actually fame and wealth through popularization. Whereas Gall actually submitted plans on reforms for the treatment of the insane and criminals,¹⁶⁷ Spurzheim never was

¹⁶¹ Tomlinson, *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*, 58; Zola-Morgan, *Localization of Brain Function: The Legacy of Franz Joseph Gall (1758–1828)*, 371.

¹⁶² Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 335.

¹⁶³ Tomlinson, *Head Masters: Phrenology, Secular Education, and Nineteenth-Century Social Thought*, 63.

¹⁶⁴ „Zum Schluß warne ich noch meine zu unbedingten Anhänger gegen den schnöden Gebrauch der vorgetragenen Lehre, indem ich sie mit einigen Hindernissen bekannt mache.“ Gall, *Der neue Teutsche Merkur*, 331.

¹⁶⁵ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 24.

¹⁶⁶ Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 334.

¹⁶⁷ Gall submitted plans for reforms to many different rulers. One in particular was to the Great Duchy of Baden. He also planned to open a hospital himself for mental patients in Vienna. Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 30.

involved in such activities.¹⁶⁸ Most likely, Spurzheim's call for social reform was merely a ploy in order to gain even more recognition for himself.¹⁶⁹ In private letters to his future wife, Honorine Pothier, Spurzheim explicitly stated that he was most interested in making money and achieving fame for his system; "[e]veryone thinks that I only work for love of science; they exhort me not to do so. They consider me better than I am...I do what I can, in order to make me known and to acquire reputation"- "My reputation must be established, and for this I do all that which I can." Furthermore, "I wish to be able to make money by the doctrine where this is possible...I shall give lectures, because this manner of getting money is the most agreeable"- "more agreeable...than that of running after the patients...I shall stay where I can gain the greatest deal of money."¹⁷⁰ Spurzheim showed in these letters that despite what he wrote in his publications, the aspect of becoming wealthy off his system was by far his most important goal. Spurzheim's goal was in complete contrast to Gall, who, even though reaped benefits both socially and financially during his tour and other lectures, established a private practice which he dedicated himself to his entire life. Gall also demonstrated actions, pushing for social reform where his system justified it. Therefore, it is easy to view Gall and Spurzheim differently. Gall, more focused on developing his system based on scientific observations, pushed to popularize his system but confined his system to only that which he believed he could prove. Spurzheim, on the other hand, manipulated Gall's system, using speculation to push it further than evidence supported, in order to expand the social implications and create a system ready for massive popularization.

¹⁶⁸ "Spurzheim was never involved in social reforms, founded no schools or asylums, and took no part in political life in Britain, Germany or France." Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 32.

¹⁶⁹ *Ibid*, 32.

¹⁷⁰ Excerpts from Spurzheim's letters are taken from letters in the Boston Medical Library, which van Wyhe quotes. *Ibid*, 32.

It was Spurzheim's system of phrenology that continued to develop, whereas Gall's system died with him. George Combe, who attended one of Spurzheim's lectures in Edinburgh, became one of Spurzheim's successors to the system. Operating at the same time as Spurzheim in Scotland, the system he was exposed to was Spurzheim's rather than Gall's. In fact, for those who practiced phrenology, there was no doubt in their minds that Spurzheim was "an authority equal with Gall, and often his superior."¹⁷¹ In Britain, and later the United States, Spurzheim was always considered a co-founder of Gall's system and phrenology, "the theory originated by Gall and Spurzheim," due to Spurzheim's own portrayal of his role in his publications and lectures.¹⁷² This was in stark contrast to Germany, where modern discussion of Gall makes no room for Spurzheim, and Spurzheim's concept of himself as a co-found or co-author never existed.¹⁷³ Taking the lead from Spurzheim, Combe started publishing his own works on phrenology in 1817 and lecturing in 1822.¹⁷⁴ Together with his brother, Andrew Combe, and four other phrenologists, George Combe founded the Edinburgh Phrenological Society in 1822, which was the first phrenological society.¹⁷⁵ In 1828, George Combe published his most well-known work, titled, *The Constitution of Man*, which is argued to be one of the most popular English books in the mid-nineteenth century.¹⁷⁶ Many more phrenological societies formed in Great Britain, and each time phrenology changed hands, Spurzheim's system was changed.¹⁷⁷ From England, phrenology spread to the United States and back to France in the 1820s and 1830s through the

¹⁷¹ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 30.

¹⁷² *Ibid.*, 30.

¹⁷³ *Ibid.*, 31.

¹⁷⁴ The History of Phrenology on the Web – Timeline. <http://www.historyofphrenology.org.uk/timeline.htm>

¹⁷⁵ *Ibid.*

¹⁷⁶ "It has been claimed that during the middle third of the 19th century, [The Constitution of Man] was the fourth most popular book in the English language, after the Bible, Pilgrim's Progress, and Robinson Crusoe." Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 795: *The Constitution of Man* is placed in Richard Atlick's list of nineteenth century English best sellers in the scientific category, selling 11,000 copies in eight years. Lightman, *Victorian Popularizers of Science*, 32.

¹⁷⁷ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 57.

use of lectures¹⁷⁸, traveling as far as Australia by 1829.¹⁷⁹ The Paris Phrenological Society in Paris, where Gall practiced and lectured in the latter half of his life, was not formed until 1831, three years after Gall passed away. Obviously, since this society was a “phrenological” one, it also preached Spurzheim’s phrenology, re-imported from England, instead of Gall’s system.¹⁸⁰ In 1840, George Combe lectured in Germany, which caused a brief resurgence of popularity in phrenology. This was helped along by Gustav von Struve, who was converted by Combe’s lectures and published his own account on phrenology in Germany.¹⁸¹

In the United States, the phrenological movement was much different. It started with Charles Caldwell, who called himself the “American Spurzheim.”¹⁸² John Collins Warren, a professor of medicine at Harvard, was the one who actually first brought phrenology overseas, but Caldwell popularized it and founded the first phrenological society in Philadelphia in 1822.¹⁸³ Quickly after this, “gingen Psychologie und die eigene Sprache der Phrenologie in den Alltagsgebrauch der Amerikaner ein.”¹⁸⁴ The Fowler family, including the brothers Lorenzo and Orson, helped push the practical side of phrenology and further developed and popularized the system. The Fowler brothers designed *Self-Improvement Directory Tables*, based on the positive twist Spurzheim gave phrenology, in their manual directed at popular audiences, titled *The illustrated self-instructor in phrenology and physiology*. These tables served to make it so that could not only practice phrenology on others, but could reflect on oneself as well, and also

¹⁷⁸ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 57.

¹⁷⁹ Simpson, Donald. “Phrenology and the Neurosciences: Contributions of F. J. Gall and J. G. Spurzheim.” *ANZ Journal of Surgery* 75 (2005): 475–482, 478. Accessed October 22, 2010. <http://www.anzjsurg.com/view/0/index.html>.

¹⁸⁰ Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 37.

¹⁸¹ The History of Phrenology on the Web – Timeline. <http://www.historyofphrenology.org.uk/timeline.htm>

¹⁸² Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 340.

¹⁸³ *Ibid*, 340.

¹⁸⁴ *Ibid*, 340.

showed that the Fowlers included more organs than Spurzheim had.¹⁸⁵ Furthermore, the Fowlers spoke out against unhealthy clothing, such as corsets because they disrupted blood flow, as well as tobacco, alcohol, and a healthy sexuality.¹⁸⁶ Phrenology also experienced popularity within the literary world both in the United States and Britain. Authors such as Edgar Allen Poe and Walt Whitman not only referred to aspects of phrenology in their texts, but were avid supporters themselves.¹⁸⁷ As phrenology became more popular and was characterized more by random practitioners reading skulls for entertainment value,¹⁸⁸ it lost credit within the scientific community.¹⁸⁹

In 1843, there were 8 phrenological societies in England and Scotland, one in Ireland, and 15 in the United States.¹⁹⁰ At this time, phrenology still had some support from medical professionals and was written positively of in English medical journals.¹⁹¹ By 1850, phrenology had lost popularity in Britain, but a new movement was spurred by the Fowler brothers, who traveled to Britain in the 1860s to lecture.¹⁹² Although phrenology was denounced within the scientific community by 1843,¹⁹³ phrenological societies continued to operate, until the last one, the British Phrenological Society, was disbanded surprisingly late in 1967.¹⁹⁴

¹⁸⁵ Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 342. For a list of the organs the Fowler brothers included, consult the appendix for comparison with Gall's and Spurzheim's lists.

¹⁸⁶ *Ibid*, 342.

¹⁸⁷ Uttal, William R. *The New Phrenology: The Limits of Localizing Cognitive Processes in the Brain*. Cambridge, Massachusetts and London, England: Massachusetts Institute of Technology Press, 2001, 105.

¹⁸⁸ For further information on the development of Phrenology in the United States, as promoted by the Fowlers consult Greenblatt's "Phrenology in the Science and Culture of the 19th Century".

¹⁸⁹ Oehler-Klein, *Die Schädellehre Franz Joseph Gall in Literatur und Kritik des 19. Jahrhunderts*, 341.

¹⁹⁰ *Ibid*, 336.

¹⁹¹ *Ibid*, 336.

¹⁹² Van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism*, 57.

¹⁹³ Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 797.

¹⁹⁴ The History of Phrenology on the Web – Timeline. <http://www.historyofphrenology.org.uk/timeline.htm>.

Chapter 4: Conclusion and Implications of Popularizing Science

In the previous three chapters, I followed the development of the *Schädellehre* into phrenology. I began with Gall as he developed his own scientific process, starting with a hypothesis based on the correlation between memory and eye prominence, and ending with him publicizing his system through lectures and books in order to define and spread his system on the presence of distinct organs in the cerebrum of the brain. Although interested in spreading his system beyond just an elite, medical audience, Gall was dedicated to developing a “science” based on evidence and demonstrated the effort to practice the system he founded. Then, the focus shifted to his assistant Spurzheim, who changed multiple aspects of Gall’s system, including parts of the fundamental philosophy in order to make it more acceptable to a wider audience, increase its popular value, and gain personal fame for himself. Spurzheim opened his system up for social reform to a greater extent than Gall, but was not active himself in any efforts to make a change. Finally, the remainder of phrenology’s course in popular society was outlined through its dedicated followers George Combe and the Fowler family, who furthermore adapted phrenology to become a system fully functioning for social reformation rather than “science” and medicine. In this chapter, I will conclude my discussion of the *Schädellehre* and phrenology by briefly bringing up some of the pitfalls of the systems and highlighting how the process of popularization altered and degraded the scientific value of Gall’s system. I will then use this as a segue into the conversation revolving around modern research techniques, specifically those in the field of neuroscience.

Although I did not discuss many of the criticisms Gall’s system faced in its history and development, it is necessary to mention that both Gall and Spurzheim were confronted with

resistance from multiple groups of people. Religious followers argued the system was materialistic, fellow physicians and anatomists criticized Gall's empirical data gathering techniques, and Gall was labeled a charlatan based on his popularization techniques during his tour through central Europe.¹⁹⁵ Most important for my purposes are those about his data gathering techniques and popularization techniques.

Pierre Flourens (1794-1867) was a French physiologist who openly spoke out against Gall's doctrine and published *Phrenology Examined*, a work dedicated to pointing out the problems in Gall's system. Based on his own experiments, in which he lesioned different sections of the cerebral hemispheres and observed the behavior of animals, Flourens found that this section of the brain could be damaged without "destroying the intelligence," and therefore, Gall was wrong in localizing the faculties of character in the cerebral hemispheres.¹⁹⁶ Although Flourens' experiments were flawed, his argument about Gall's lack of formal experimental pursuits is legitimate. This criticism is especially important by modern standards, which enforces hypothesis-based, control experimentation in most scientific research studies, whereas critics arguing about the materialistic aspects of Gall's system would not exist today. Interestingly, despite his criticism of Gall's system, Flourens appreciated Gall's anatomical discoveries¹⁹⁷ and denounced Spurzheim as a plagiarizer who earned his fame riding off of Gall's ingenuity.¹⁹⁸

As for Gall's and more importantly, Spurzheim's popularization techniques, I do not want to focus on whether Gall was a charlatan or not, but rather how these techniques employed damaged, and effectively destroyed, the scientific value of Gall's system. In order for Spurzheim

¹⁹⁵ Gall, *On the functions of the brain and of each of its parts vol. 1*, 19: Van Wyhe, "The authority of human nature: the *Schädellehre* of Franz Joseph Gall," 25.

¹⁹⁶ Flourens, Pierre. *Phrenology Examined*. Translated by Charles de Lucena Meigs. Philadelphia: Hogan and Thompson, 1846, 34.

¹⁹⁷ *Ibid*, 128.

¹⁹⁸ "Spurzheim makes Gall's book over again – the same book that they commenced together – and abridges it," "Spurzheim never would have imagined the doctrine: he found it already concocted." *Ibid.*, 98, 100.

to construct a system that would be appealing to a broad audience, and thus popular, he had to compromise many of the aspects of the *Schädellehre*, which helped define it as a “science.” Making these compromises, though, resulted in phrenology hiding the deeper meaning and structure that had characterized its predecessor and opened it up for greater amounts of criticism. Although Gall’s system would have been discredited on its own, Spurzheim accelerated the process through his development of phrenology.¹⁹⁹ Furthermore, due to the “popular science” status that phrenology gained from the massive amount of people “practicing” it, offering head readings tarnished the name of Gall and encumbered the development of cortical localization as a prominent theory.²⁰⁰ Flourens’ criticism, in destroying Gall’s system, also helped remove cortical localization from the minds of prominent thinkers until the late 1860s.²⁰¹ Not until scientists such as Fritsch and Hitzig, Wernicke, Broca, and Ferrier was cortical localization restored to a potentially legitimate school of thought. Because of this delegitimization, Gall became better known both in the nineteenth century and now as the founder of phrenology²⁰² instead of being

¹⁹⁹ “Phrenology had a double face, which explains its success at the beginning and also its discredit at the end. A science on the one hand, it satisfied the intellectual curiosity of scientists and of reformers with scientific aspirations. A type of “somatomancy,” on the other hand, a more or less traditional method of divination based on the shape of the human body, inheriting superstitious habits of venerable antiquity, it quieted the anxieties of the everlasting crowd. To use phrenology as a somatomanticist, one did not need either education or scientific aims. Many traveling practitioners of phrenology, men without education, and most of the time quacks, began to appear in later stages of phrenology’s development, chiefly in the Anglo-Saxon countries; the results were as disastrous for its scientific progress as they were for its scientific reputation.” Ackerknecht, *Franz Joseph Gall, inventor of phrenology and his collection*, 33.

²⁰⁰ “By 1843, the entire Western scientific community rejected organology and phrenology. All forms of cerebral localization were lumped with phrenology and similarly repudiated.” Greenblatt, “Phrenology in the Science and Culture of the 19th Century,” 790.

²⁰¹ Uttal, *The New Phrenology*, 107.

²⁰² “It is somewhat ironic that Gall became one of the most influential scientists of the nineteenth century based not on his reputation as an outstanding scholar, physician, and anatomist, but instead on his identity by the scientific community and the general population as the found of ‘phrenology.’” Zola-Morgan, *Localization of Brain Function: The Legacy of Franz Joseph Gall (1758–1828)*, 361.

remembered for his multiple anatomical discoveries.²⁰³ This is especially ironic since the ideas and values of phrenology differed significantly from those of his own system.²⁰⁴

One of the earliest and most memorable milestones in the restoration of cortical localization as a leading theory was the discovery of Broca's area.²⁰⁵ Broca's area, which is involved in the production of speech, was originally positioned behind the eyes in both hemispheres by Gall,²⁰⁶ but was isolated to a spot on the left frontal lobe. Paul Broca (1824-1880), a French neurologist, pinpointed this location in 1861 based on a patient who was almost unable to speak entirely, and was revealed to have a unilateral lesion to the left frontal lobe upon post-mortem dissection.²⁰⁷ Nearly twenty years after Gall's system was widely rejected, Broca demonstrated in his report on his findings that any connection to Gall and his ideas could be a detriment to advancing the theory of cortical localization. An obvious triumph for this theory and to some degree, potentially validating for Gall's system, Broca failed to mention Gall in his report, and instead denounced Gall's system.²⁰⁸ He commented that, "if ever there were to be a phrenological science, it would be the phrenology of convolutions, not bumps," implying that the structure of the brain, and not the skull, might relate information about its function.²⁰⁹ Because phrenology was associated with a death-sentence for any studies that mentioned it, many neurologists and scientists, such as Broca and David Ferrier who explored cortical localization

²⁰³ For a summarized list of some of Gall's more significant anatomical findings, read Erna Lesky's "Structure and Function in Gall" (297-298).

²⁰⁴ *Ibid.*, 372.

²⁰⁵ Another important case was that of Phineas Gage, who had his frontal lobe impaled by an iron rod and suffered from personality and behavior changes. For more information and the relationship between this case and phrenology, consult Barker, Fred G. "Phineas among the phrenologists: the American crowbar case and nineteenth-century theories of cerebral localization." *Journal of Neurosurgery* 82 (April 1995): 672-682. Access October 22, 2010. www.annualreviews.org.

²⁰⁶ Organ 15, "Faculty of spoken language; talent of philology, &c. (Sprach-Forschungs-sinn)" Gall, *On the functions of the brain and of each of its parts vol. 5*, 18-46.

²⁰⁷ Bear, Mark F., Barry W. Connors, and Michael A. Paradiso. *Neuroscience: Exploring the Brain*. 3rd ed. Philadelphia, Boston, and New York: Lippincott, Williams, and Wilkins, 2007, 620.

²⁰⁸ Zola-Morgan, *Localization of Brain Function: The Legacy of Franz Joseph Gall (1758-1828)*, 378.

²⁰⁹ Quoted in Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 799.

felt the need to either ignore Gall, or to even speak out against phrenology in order to demonstrate a difference between their ideas and Gall's system.²¹⁰ Broca, in this case, drew a distinction between cortical localization, demonstrated with his data, and cranial localization, as argued by Gall.²¹¹ Interestingly once again, Gall was linked to Spurzheim's system of phrenology, which although similar to his own, was different, especially in the fact that Spurzheim emphasized the use of skull readings.

The vast disapproval within the scientific community of Gall's system was amplified by the immense popularity that phrenology experienced in the early and mid-nineteenth century. Gall and his system had been criticized in Vienna, Germany, and Paris, but even his most avid critic, Flourens, accepted that Gall was a superb anatomist who made significant contributions to the anatomical understanding of the nervous system. But when Spurzheim moved to popularize Gall's system, he downgraded the importance Gall placed on these discoveries and exaggerated others, thus changing Gall's "science". This is a hallmark of the problem with popularizing science – in order to make science appeal to a broad audience, the necessary foundation can be understated for understanding purposes, and other aspects, like social reform in phrenology, emphasized. For most discoveries, such as the function of an ion channel in the cellular membrane, to be published in a scientific journal today, indirect connections must be made to spotlighted topics such as Alzheimer's disease or cancer, to make the reported results seem more worthwhile. These rather simplistic findings must be tied to a larger problem that society has deemed important to investigate in order to justify the research. But when a science is popularized, sometimes only a certain few, attractive details are fully explained, which ends up changing the understanding and perception of the original science, if not the structure itself.

²¹⁰ Greenblatt, "Phrenology in the Science and Culture of the 19th Century," 790.

²¹¹ *Ibid*, 799.

A recent example of this can be seen with the Human Genome Project. A highly successful project aimed at mapping the entire human genome, it focused the public's attention on the concept of heredity and the possibility of eliminating many medical disorders through a better understanding of our own genetic makeup.²¹² The public became so interested and set such high expectations that “many experts now worry about the massive oversimplification that has crept into popular understanding of the role played by heredity in individual development.”²¹³ Because of this misunderstanding, people do not recognize the limitations of the role that a single gene plays in creating a given phenotype, and seem to think that the findings will discover genes “‘for’ every particular character, good or bad, and look to a time when ‘designer babies’ can be produced with only the best aspects of their parents’ characters.”²¹⁴ Therefore, the public has placed more power into the understanding of our genome and seems to think that there is a given gene that can control characteristics such as intelligence or, as with phrenology, the ability to become a criminal. Peter Bowler warns of the “re-emergence of a new and even more insidious form of eugenics” due to this misunderstanding of genetics by the public, bringing back ideas of the Holocaust and the how the concept of genetic determinism “can get out of control.”²¹⁵ Although this is a rather extreme case, Bowler is right to point out these implications for misunderstanding science. As demonstrated by the Human Genome Project and as will be furthermore shown by an in-depth discussion of fMRI studies, when scientific findings are misinterpreted and spread, it can give the large public audience a misconception of what the science actually means, and at the same time, gives the skewed interpretation more influence.

²¹² Bowler, Peter J. and Iwan Rhys Morus. “Genetics.” In *Making Modern Science: A Historical Survey*, 189–212, 189. Chicago and London: University of Chicago Press, 2005.

²¹³ Ibid, 189.

²¹⁴ Ibid, 189.

²¹⁵ Ibid, 189.

The scientific field of neuroscience is also among those susceptible. A relatively new and rapidly developing field, there are many areas within neuroscience that attract popular attention, such as neurotheology, cognitive neuroscience, neuroesthetics, neuroeconomics, neuropsychology, neuroeducation, and neurolaw.²¹⁶ Although neurotheology, an attempt to locate a specific portion of the brain to spirituality, could just as easily be explored due to its relation to phrenology²¹⁷, as could the majority of these other specialties within neuroscience, I want to focus on cognitive neuroscience, and more specifically, imaging studies such as functional magnetic resonance imaging (fMRI) studies, which have also been labeled as a “new phrenology.”²¹⁸

Gaining popularity since the 1990s, fMRI is the most popular imaging method.²¹⁹ In order to locate sections of the brain utilized in certain cognitive processes, fMRI measures the blood flow within the brain.²²⁰ The underlying premise is that if a certain portion of the brain increases its level of activity, it will expend more energy and thus require more nutrients, which is supplied to the brain throughout the circulatory system. Therefore, an increased blood flow to a certain area of the brain is thought to implicate that area in the specific cognitive process being tested. Originally, fMRI was used to study sensory and motor functions, but has been applied at an increasing rate to topics “with potential ethical legal, social and policy implications, such as attitudes, cooperation and competition, violence, or religious experience.”²²¹ Although it is a

²¹⁶ Vidal, Fernando. “Brainhood, anthropological figure of modernity.” *History of the Human Sciences* 22 (2009): 5–36, 22. Accessed October 12, 2010. doi: 10.1177/0952695108099133.

²¹⁷ For an interesting review of the efforts in and development of the field of neurotheology, consult: Norman, Wayne D. and Malcolm A. Jeeves. “Neurotheology: Avoiding a Reinvented Phrenology.” *Perspectives on Science and Christian Faith* 62 (December 2010): 235–252. Accessed March 11, 2011. http://www.asa3.org/html_pages/PCSF.html.

²¹⁸ Uttal, *The New Phrenology*.

²¹⁹ Vidal, “Brainhood, anthropological figure of modernity,” 22.

²²⁰ *Ibid*, 22.

²²¹ *Ibid*, 23. “We have all seen scans with highlighted (usually in red) areas where your brain “lights up” when thinking about X (money, sex, God, and so on). This new modularity metaphor is so seductive that I have employed

popular tool amongst scientists, the images created by the studies have generated massive social appeal. After measuring the changing amount of blood flow throughout the brain during a certain task, this data is converted into a picture of the brain, colored differently based on the varying levels of blood flow. This “pop-art beauty” and relatively easy ability to be read has captivated the public audience and resulted in the images being viewed as representations of the self.²²² Ironically, the images could appear entirely differently based on how the computer is programmed and the results that the public views are based on mere correlative and speculative data.

There are many problems that underlie fMRI studies, both technical and theoretical. Because there is an interaction between the two in many cases, I will bring up the technical and theoretical problems together, making it easier to discuss them as one. As mentioned in the last paragraph, the machine measures a change in the amount of oxygenated blood with respect to deoxygenated blood based on the difference in magnetism resulting from the difference in charges between oxygenated and deoxygenated blood. The change in charge associated with this is supposed to indirectly measure neuronal activity through a series of correlations – increased brain activity leads to a faster breakdown of glucose and thus a higher need for oxygen, which finally leads to an increased blood flow and higher levels of oxygenated blood. Therefore, the initial problem is that fMRI does not directly measure neuronal activity, but rather relative oxygenated hemoglobin levels. An fMRI study by Reiman, cited by William Uttal, demonstrated that clenching one’s teeth is enough of a muscular response to cause false positives on an fMRI

it myself in several books on the evolution of religion (belief modules), morality (moral modules), and economics (money modules).” Shermer, Michael. “The Brain Is Not Modular: What fMRI Really Tells Us.” *Scientific American Mind*, May 13, 2008. Accessed March 18, 2011. <http://www.scientificamerica.com/article.cfm?id=a-new-phrenology>.

²²² Vidal, “Brainhood, anthropological figure of modernity,” 24.

scan.²²³ Since fMRI studies aren't directly measuring brain activity, it makes us question if the correlation between oxygenated blood levels and brain activity is sufficient. Uttal argues that due to the "complexity of blood flow control at the fine level of regional capillaries," this correlation might not be as strong as we would like.²²⁴ Furthermore, there is a time discrepancy between neural activity and blood flow. Whereas neurons act on a time scale of milliseconds, blood flow changes are measured in seconds, making David Dobbs raise the possibility that the measured increase in blood flow might actually be "'feeding' more than one operation."²²⁵

Besides the technical question of what is actually being measured and if the correlation is strong enough to make conclusions about neuronal activity, there is a theoretical question about this "activity" which must be posed – what does "activity" actually mean? To those who have a limited education in neuronal functions, the most logical answer to this question would be that an increase in blood flow results in an increase of excitatory activity. In other words, if the increase blood flow is localized to a specific region, then that region must be in charge of prompting other systems of the body to act, and thus create the action that researchers are investigating. The problem with this is that the brain does not just work in an excitatory fashion. Neurons in the brain also function to provide inhibitory stimuli, which are important for synchronizing messages and responses amongst other actions.

The assumption of only excitatory activity simplifies the actions of the brain, making it seem that the brain region that lights up on the scan creates the action. Once again, it is not likely that all of the parts of the brain function to create actions. Instead, some of them relay information between two different regions as well as process information coming in from other areas. Also, this correlation is unable to answer if the brain region is receiving input from other

²²³ Uttal, *The New Phrenology*, 171.

²²⁴ *Ibid*, 170.

²²⁵ Dobbs, David. "Fact or Phrenology." *Scientific American Mind* 16 (2005), 24–31, 25.

regions, and is thus processing, or if it is sending out signals to other sections of the brain. All that fMRI scans do are show that the level of oxygenated blood in a section of the brain increases, which *may* correlate to brain activity. It by no means whatsoever is capable of telling us what that brain activity might be, limiting the insight these studies give to brain function.²²⁶

These studies furthermore seem to indicate that the brain functions in discrete areas, like Gall and Spurzheim argued with their primitive ideas of cortical localization. According to Dobbs, “few researchers seriously believe that brain functions are *so* compartmentalized.”²²⁷ As Broca and others have shown, there are certain areas of the brain that have been implicated in playing major roles in behaviors such as producing speech. It is obvious that there is some degree of localization to the brain, as further supported by the motor and sensory regions, but it would not be surprising if these regions play a role in more complex behaviors and processes as well.²²⁸ In fact, it has become evident that for more complex behaviors, multiple regions will be recruited, playing a role in a complex network.²²⁹ Regions that were thought to be dedicated entirely to motor and sensory functions have been implicated in more complex cognitive functions. Despite this understanding, or better yet, lack of understanding about how the brain functions, most fMRI studies focus on how certain processes activate certain areas, provoking the “biting accusation that fMRI studies constitute ‘the new phrenology.’”²³⁰ The link from the fMRI picture to the conclusion that a certain area is in charge of a given function is further made worse when people reverse this correlation. Russel Poldrack uses the amygdala as an example; “we can show that if I put you into a state of fear, your amygdala lights up, but that doesn’t mean

²²⁶ For more information on neuronal function and sections of the brain implicated in certain behaviors consult Bear, *Neuroscience*.

²²⁷ Italics were added by the author to add emphasis. Dobbs, “Fact or Phrenology,” 28.

²²⁸ Pages 6 through 13 of Uttal’s book, *The New Phrenology*, do a good job covering many of the important historical contributions of scientists to identifying brain regions. Uttal, *The New Phrenology*, 13.

²²⁹ *Ibid*, 14.

²³⁰ Dobbs, “Fact or Phrenology,” 28.

that every time your amygdala lights up you are experiencing fear,” and further goes on to discuss the functioning of the brain; “every brain area lights up under lots of different states. We just don’t have the data to tell us how selectively active an area is.”²³¹ Once again, we see that little is known about how the brain actually functions, and if not fully understood, fMRI studies seem to point towards an incorrect view and lead to wrong conclusions.

Uttal brings up the problem of setting a threshold as a major problem for fMRI studies. In order for researchers to interpret the data they get from fMRI scans, they first subtract the activity they measure from a basal, or resting, state. Then the researcher must set the threshold level in order to designate what is “significant” and what is “insignificant.” The first problem rests with the subtraction method. “The subtraction process always produces a peak someplace at some level of the threshold control. If a peak is not visible at one criterion level, the threshold can be lowered until some difference value is accepted as a response.”²³² According to Uttal then, fMRI studies are inherently flawed because there will always be a peak, and therefore a section of the brain will be implicated for every type of behavior. Uttal further argues that the threshold level itself is arbitrary and set by the researcher wherever they need it to be to find a result. This further calls into question the validity of the results from these studies. If a threshold is set high, then a lot of lower signal responses will be overlooked, which could be important to deciphering neuronal networks. But if a threshold is set low, then multiple regions will be “active”. Multiple regions lighting up would make the most sense, if the hierarchy of correlations is indeed legitimate, since the brain processes information through the use of multiple different areas. But researchers conducting fMRI studies do not want to corroborate the “broad distribution” theory. Instead, they want to argue for discrete areas, because in doing so, they will

²³¹ As quoted in Shermer, “The Brain Is Not Modular.”

²³² Uttal, *The New Phrenology*, 185.

have “discovered” something worthy of publishing in a scientific journal, earning their laboratory publicity, and hopefully, funding.

Finally, the threshold level problem calls into question the role of the experimenter.²³³ Every researcher conducts experiments with a hypothesis in mind, and this hypothesis will impact how they conduct their experiment. With regards to threshold, “a conservative assignment could hide localized activity and a reckless one suggest unique localizations that are entirely artifactual.”²³⁴ Thus, as mentioned before, if the researcher wants to implicate a given region’s role in a specific mental process, then the level they set for threshold will change. Furthermore, the researcher is at risk of overanalyzing their data in search of a significant finding, which according to Steven Faux, happens too often.²³⁵ It also takes some technical skill to interpret the fMRI scans to come up with actual results, resulting in more problems if someone who is not experienced in taking in the whole picture reads a scan.²³⁶ And since brain imaging technology is rapidly changing, new problems arise. Hopefully, at the same time, many of these problems are being eliminated and the process systematized such that there is less room for human error. In any case, Faux concisely summarized the field of cognitive neuroscience and fMRI studies when he said, “the beautiful graphics fMRI produces imply much more precision than there actually is...it’s really a very gross, if not vague, physiological measurement that people are using to try to pin down some very complex behaviors.”²³⁷

Because of the speculative nature and correlation based results of fMRI studies, their actual worth for understanding the functioning of the brain has been called into question, and

²³³ I would like to thank Vanessa Agnew, who brought up the important role the experimenter plays when we discussed the experiments Goethe explained in his Theory of Color.

²³⁴ Uttal, *The New Phrenology*, 168.

²³⁵ “In too many studies the authors way overinterpret the data.” As quoted by Dobbs, “Fact or Phrenology,” 26.

²³⁶ Dobbs quotes Abigail Baird in Dobbs, “Fact or Phrenology,” 27.

²³⁷ As quoted by Dobbs, “Fact or Phrenology,” 26.

once again, connected to the problems of phrenology.²³⁸ There are many practical concerns relating to health issues that make it essential that we understand the functioning of the brain, but also the “limitations and misdirections as well as progresses and successes” of fMRI and other brain imaging studies.²³⁹ Neuroscientists and psychologists themselves are speaking out against the overuse of fMRI studies, as evidenced earlier.²⁴⁰ Steven Faux, a critic of fMRI studies, said “it’s like a blurry photo – better than no photo but still blurry, with real limitations that are too often overlooked. It’s very easy to overextend [the value of] this technology.”²⁴¹ Vilayanur Ramachandran, a modern neurologist, is cited as stating that “98% of brain imaging is just blindly groping in the dark.”²⁴² Just like Gall’s limited ability to study human subjects, it is hard to conduct experimental research on human brains due to a lack of willing patients, as well as ethical standards. Therefore, brain imaging techniques, which are non-invasive, and thus acceptable to perform on human subjects, are utilized in hopes of answering questions and solving challenges present in health and medicine.²⁴³ Despite this, the limitations are so great that the results from these studies are accompanied with uncertain meaning and a limited amount of societal value. Because of the practical applications within the fields of neuroscience, it is dangerous if both the limitations and results of fMRI studies are not fully understood.

Even though the results and meanings of fMRI are ambiguous, lawyers and others outside of the field of science try to use them to advocate for changes in their fields. For example, Stephen Morse cites a criminal law case where they wanted to abolish the death penalty for

²³⁸ “For 19th-century British and German brain scientists, the method of correlating clinical and pathological phenomena was suspiciously reminiscent of the craniological approach [phrenology]” (17) – “Like research on consciousness and the brain localization of self, the *neuro* fields that thrive on the availability of fMRI are mostly about material foundations and ‘neural correlates’” (23). Uttal, *The New Phrenology*.

²³⁹ *Ibid*, 5.

²⁴⁰ “There is a skeptical movement afoot to curtail abuses of the metaphor, however, and it is being driven by neuroscientists themselves.” Shermer, “The Brain Is Not Modular.”

²⁴¹ As quoted by Dobbs, “Fact or Phrenology,” 24.

²⁴² Vidal, “Brainhood, anthropological figure of modernity,” 23.

²⁴³ *Ibid*, 22.

sixteen and seventeen year old murderers based on scientific studies that demonstrated adolescents at this stage of development lacked complete myelination of neurons, which were thought to impact their behavior.²⁴⁴ Although these studies are not fMRI studies, Morse’s argument, which he sums up with, “brains do not commit crimes; people commit crimes,” applies to them, as well as many others in the field of neuroscience.²⁴⁵ Because most of the data and findings in neuroscience, including fMRI studies, are limited in their applications, if not also uncertain about the meaning of the actual findings, Morse came up with the term “Brain Overclaim Syndrome” to describe any event where someone uses neuroscience research findings²⁴⁶ to make larger, unfounded conclusions of behavior.²⁴⁷ As Morse correctly argues, “we still know woefully little about how the brain enables the mind, and especially about how consciousness and intentionality can arise from the complicated hunk of matter that is the brain.”²⁴⁸ Therefore, it is ridiculous to attempt to use neuroscientific research findings to argue for things such as legal reform, but the frightening reality is, people try to do so.

As with every new research tool and science, it is best to understand it fully before using it, but this is not always the case due to heightened expectations for what that science or tool should be able to deliver and accomplish. For neuroscience, phrenology, and many other fields of study not just limited to science, Morse’s term “Brain Overclaim Syndrome” symbolizes this problem. The popularization of science heightens this problem as people who do not participate in these fields of research themselves are brought into contact with them on a daily basis through

²⁴⁴ Morse, Stephen J. “Symposium: The Mind of a Child: The Relationship between Brain Development, Cognitive Functioning, and Accountability under the Law: Brain Overclaim Syndrome and Criminal Responsibility: A Diagnostic Note.” *The Ohio State Journal of Criminal Law* 3 (2006): 397–412, 397. Accessed March 18, 2011. <http://moritzlaw.osu.edu/osjcl/>.

²⁴⁵ *Ibid*, 397.

²⁴⁶ Morse points to brain imaging studies actually being a big problem; “Brain imaging studies have been the most potent pathogen causing BOS.” *Ibid*, 403.

²⁴⁷ *Ibid*, 400 and 406: “The final expression of BOS is to make claims about the relation of the brain to responsibility that cannot be sustained logically or empirically.”

²⁴⁸ *Ibid*, 403.

the media. Although I am not calling fMRI studies entirely fraudulent, as a scientist focusing in the field of neuroscience, I am advocating for increased caution when interpreting the results that these studies report. Just like the Human Genome Project, fMRI studies can be beneficial to the progress of science if used correctly. Not all neuroscientists are against the use of fMRI studies, but many of them recognize the problems of “taking a little bit of science and going way beyond it.”²⁴⁹ It is important to note that not every researcher who utilizes fMRI studies does so for the purpose of popularizing their results either. By discussing the effects of popularization on the *Schädellehre* and tying these problems to current trends in the field of neuroscience, I hope to demonstrate some of the implications that popularizing science can have on society. I am by no means arguing that efforts of scientists should be kept to a limited, scientific audience because it is important to collaborate with others outside of one’s own field. Instead, it is important to realize that all sciences have their own limitations, and that we are aware of these limitations when understanding a given studies results and further implications.

Furthermore, I hope to demonstrate with this thesis the reciprocal influence that the desires of society can have on science. Science itself is a social structure. Although it is often assumed that science is in search of the “truth” and that we progressively move in the right direction, this is not always the case. As shown with phrenology, science does not always move in the direction of truth and is not void of criticism. Rather, it is necessary for the development of science that criticism, not limited entirely to contemporaries within one’s own field, exists and is fostered, especially as a means of reminding everyone about the limitations science has.

²⁴⁹ Shermer, *The Brain Is Not Modular*.

Appendix:

Gall, *On the functions of the brain and of each of its parts*, vol. 3-5

Fundamental powers (shared by man and animals)

1. Instinct of generation, of reproduction
2. Love of offspring
3. Attachment. Friendship.
4. Instinct of self-defence, disposition to quarrel, courage (*Muth, Raufsinn*)
5. Carnivorous instinct; disposition to murder (*Wurgsinn*)
6. Cunning, trick, tact (*List, Schlauheit, Kluheit*)
7. Sense of property, instinct of providing, covetousness, propensity to steal (*Eigentumssinn, Hang zu Stehlen*)
8. Pride, hauteur, loftiness, elevation (*Stolz, Hochmuth, Herschsucht*)
9. Vanity, ambition, love of glory (*Eitelkeit, Ruhmsucht, Ehrgeitz*)
10. Cautiousness, foresight (*Behutsamkeit, Vorsicht, Vorsichtigkeit*)
11. Memory of things, memory of facts, sense of things, educability, perfectibility (*Sachgedächtniss Erziehungs-fähigkeit*)
12. Sense of locality, sense of the relations of space (*Ortsinn, Raumsinn*)
13. The faculty of distinguishing and recollecting persons (*Personen-sinn*)
14. Faculty of attending to and distinguishing words; recollection of

words, or verbal memory (*Wortgedächtniss*)

15. Faculty of spoken language; talent of philology, etc (*Sprach-Forschungs-sinn*)
16. Faculty of distinguishing the relation of colors; talent for painting (*Farben-sinn*)
17. Faculty of perceiving the relation of tones, talent for music (*Ton-sinn*)
18. Faculty of the relations of numbers
19. Faculty of constructiveness (*Kunst-sinn, Bau-sinn*)

Intellectual faculties and moral qualities (unique to man)

20. Comparative sagacity, aptitude for drawing comparisons (*Vergleichender Scharf-sinn*)
21. Metaphysical depth of thought; aptitude for drawing conclusions (*Metaphysischer Tief-sinn*)
22. Wit (*Witz*)
23. Talent for poetry (*Dichter Geist*)
24. Goodness, benevolence, gentleness, compassion, sensibility, moral sense, conscience (*Gulmähigkeit, Mitleiden, Moralischer-sinn, Gewissen*)
25. Faculty of imitation, mimicry
26. God and religion
27. Firmness, constancy, perseverance, obstinacy

Spurzheim, *Outlines of Phrenology* –

Special Faculties of the Mind

Order I – Feelings, or Affective Faculties

Genus I – Propensities

Desire to Live
Alimentiveness

1. Destructiveness
2. Amativeness
3. Philoprogenitiveness
4. Adhesiveness
5. Inhabitiveness
6. Combativeness
7. Secretiveness
8. Acquisitiveness
9. Constructiveness

Genus II – Sentiments

10. Cautiousness
11. Approbativeness
12. Self-esteem
13. Benevolence
14. Reverence
15. Firmness
16. Conscientiousness
17. Hope
18. Marvellousness
19. Ideality
20. Mirthfulness
21. Imitation

Order II – Intellectual Faculties

Genus I – External Senses

Voluntary motion
Feeling
Taste
Smell
Hearing
Sight

Genus II – Perceptive Faculties

22. Individuality
23. Configuration
24. Size
25. Weight and resistance
26. Coloring
27. Locality
28. Order
29. Calculation
30. Eventuality
31. Time
32. Tune
33. Artificial language

Genus III – Reflective Faculties

34. Comparison
35. Causality

Fowler, *The illustrated self-instructor in phrenology and physiology.*

30. Calculation
31. Locality

Domestic Group

1. Amativeness
2. Philoprogenitiveness
3. Adhesiveness
4. Inhabitiveness
5. Continuity

Literary Faculties

32. Eventuality
33. Time
34. Tune, Music
35. Language

Selfish Propensities

Vitativeness

6. Combativeness
7. Destructiveness
8. Alimentiveness
9. Acquisitiveness
10. Secretiveness
11. Cautiousness
12. Approbativeness
13. Self-esteem
14. Firmness

Reasoning Faculties

36. Causality
37. Comparison
- Human Nature
- Agreeableness

Moral Faculties

15. Conscientiousness
16. Hope
17. Spirituality
18. Veneration
19. Benevolence
20. Constructiveness
21. Ideality
- Sublimity
22. Imitation
23. Mirthfulness

Intellectual Faculties, Perceptive Faculties

24. Individuality
25. Form
26. Size
27. Weight
28. Color
29. Order

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