

INTRODUCTION

. . . A French savant once not inaptly styled the sensitive photographic plate the “retina of science,” but . . .the sensitive film possesses some power of discriminating greater than that possessed by the human retina . . .

—Dr. T. Charles White, “The Retina of Science,”
The Photographic News (1885)

In this study, I examine American medical photography at a moment when photography and American medicine are each affected by the other. Improvements in photographic technologies — specifically the development of the gelatin-based dry plate (by a physician)¹ in 1878 and the introduction of the mechanical shutter — enabled physicians to employ photography to gain scientific authority. American medicine, in its embrace of photographic imaging techniques, validated photography’s contested status as an unbiased mechanical witness. This dissertation argues that aesthetic decisions and fine art practices informed medical uses of photography, just as photography gained legitimacy through doctors’ use of it for scientific purposes.

After the Civil War, American medicine was struggling with internal conflicts about the etiological constructions of disease. By the late 1870s, the leading practitioners who were attempting to use scientific methods to locate

¹ Dry plates were initially introduced in 1867, but the emulsion was so much slower than the wet-plate counterpart that they were not of much use. Interestingly, it was a physician, Dr. Richard Leach Maddox, who initially published findings on the use of an emulsion made with gelatin. He announced his discovery in the *British Journal of Photography* in 1871. It was not until 1878 that Charles Harper Bennet discovered a method of drying the emulsion that allowed him to make photographic images at “snapshot speeds.” Beaumont Newhall, *The History of Photography* (New York: The Museum of Modern Art, 1964), 79-88. See also Naomi Rosenblum, “A Short Technical History: Part II,” *A World History of Photography* (New York: Abbeville Press Publishers, 1984), 442.

causality for disease were overpowering the voice of the traditionalists who still tightly held to constitutional justification for disease.² The pursuit and esteem of scientific validity created a perfect moment for the embrace of photographic imaging techniques by an evolving medical discourse. Although prior to the use of the x-ray, photography had not provided medicine with a definitive diagnostic technique, it did provide an avenue for the construction of a medical object for scientific inquiry. Thus, it helped medicine to attain scientific validity by aiding in the construction of subjects that were the exclusive purview of the medical profession.

In Europe, attempts to incorporate scientific methods into medicine preceded similar attempts in the United States. Comparing European medicine's pursuit of science with the U.S., Phyllis Allen Richmond noted that,

. . .the decades of greatest activity in Europe – about 1850 to 1880 – coincided with a period of minimum activity in the United States. A glance at the etiological sections in American books and journals of these decades shows that the old miasmatic and atmospheric theories were still of paramount importance. . .³

While European physicians repented to new theories from science, American doctors remained committed to traditional theories of disease.

The historian of medicine, John Duffy, links the lack of interest in science in the United States with its apparently limited financial reward. Although after

² Traditional beliefs, holding close to theories of the humors, defined disease according to "constitution" and later "diathesis." Diathesis was a term invoked in the second half of the nineteenth century to describe a body's tendency to suffer from disease. See John S. Haller, "Every Man in His Humor," chapter 1 in *American Medicine in Transition, 1840-1910* (Urbana, Chicago and London: University of Illinois Press, 1981), 3-35.

³ Phyllis Allen Richmond, "American Attitudes Toward the Germ Theory of Disease (1860-1880)," in Gert H. Brieger, ed., *Theory and Practice in American Medicine* (New York: Science History Publications, 1976), 58-84.

the Civil War, the United States was becoming a “ranking industrial nation,”

Americans had little interest in pursuits that did not have the potential for

immediate monetary gain:

. . . Americans were too preoccupied with economic growth and making money to concern themselves with an abstraction such as basic research. Unless an immediate benefit could be seen, neither business nor government was interested. In consequence, while European scientists were making major discoveries in chemistry, physiology, and related medical sciences, with a few exceptions American physicians were content to concentrate on their medical practices, and, when new viewpoints were set forth, to defend traditional ideas. . . the caliber of medical schools was only a little better in the immediate postwar years than in the early nineteenth century, and, with the multiplication of diploma mills toward the end of the century, it may even have been worse. This fact, combined with the inability of physicians to deal with the major diseases, guaranteed that while individual physicians were admired, the profession collectively continued to have little public respect.⁴

An individual physician who was greatly admired, John Shaw Billings, was among the physicians in the latter quarter of the nineteenth century attempting to propel American medicine toward science. He was a key figure in promoting the organization and accumulation of medical knowledge in the post-Civil War United States. In 1865, after serving as a surgeon during the war, he was placed in charge of the library of the Surgeon General’s Office.⁵ He eventually developed this small library collection into his vision of a formative institution for the amassing and dissemination of medical research and writing,

⁴ John Duffy, *From Humors to Medical Science, A History of American Medicine*, 2nd ed. (Urbana and Chicago: University of Illinois Press, 1993), 167.

⁵ Billings was appointed director of the Library of the Surgeon General’s Office in 1865; Billings’s oversight of this and the Army Medical Museum lasted until 1895, when he retired from the military. The library is now called the National Library of Medicine. When Billings took over the library in 1865, there were 1800 volumes in the collection; in 1880, there were 50,000 volumes and 60,000 pamphlets. See John Shaw Billings, “Letter to the Secretary of the Medical Society of the County of New York,” *Medical Record* 17 (1880), 298-299.

the National Medical Library. He was also instrumental in the development of the Army Medical Museum of which he officially was put in charge in 1883.⁶ From its inception, this medical museum valued photographs as containers of diseased bodies for cataloguing and study. Extensive photographic study of injuries were made during the Civil War for the museum. Billings, a leading advocate of the practice of scientific medicine in America, was quite vocal in his encouragement of the assimilation of European scientific practices in American medicine⁷ and used photography to this end during his tenure at the museum.

In 1876, the *American Journal of the Medical Sciences* published a series of articles called "A Century of American Medicine, 1776-1876," that set out to

⁶ Dr. William J. Hammond, Surgeon-General from 1862-1863, established the Army Medical Museum during the Civil War. Surgeon-General Lovell established the library in the Surgeon General's Office in 1836. At the beginning of the Civil War, the library's collection contained 300-400 volumes; Dr. Hammond added 359 volumes to the collection during his tenure as Surgeon-General. See Billings, "Letter. . ." In creating the Army Medical Museum, Dr. Hammond, issued a circular that was distributed to Army medical personnel that stated, "to establish in Washington an Army Medical Museum, medical officers are directed diligently to collect and to forward to the office of the Surgeon-General, all specimens of morbid anatomy, surgical or medical, which may be regarded as valuable; together with projectiles and foreign bodies removed, and such other matters that may prove of interest in the study of military medicine or surgery." Circular No. 2, Surgeon-General's Office, Washington, D.C., May 21, 1862. See John Shaw Billings, "On Medical Museums, With Special Reference to the Army Medical Museum at Washington," *The Medical News* 103:12 (September 22, 1888), 309-316.

⁷ Billings was an admirer of German and English medical accomplishments and he drew upon these achievements for the design of the Johns Hopkins Hospital and Medical School. His involvement with Johns Hopkins began in 1875. His innovative design was a pavilion plan and included physiological and pathological laboratories. Billings also acted as chief medical advisor to the President of the new medical school, Daniel Coit Gilman. He designed the curriculum and brought William Osler and William H. Welch to the faculty at the school. Frank Bradway Rogers, "The Life of John Shaw Billings," *Selected Papers of John Shaw Billings* (Medical Library Association, 1965) 6-7. Welch, who was put in charge of the pathological laboratories, was Billings's first appointment at Hopkins. Welch helped Billings to shape Hopkins as an important institution for the study and practice of scientific medicine: "Welch. . .set up the pathological laboratories to provide guidance for the different hospital departments and to put a scientific stamp on them at once." Samuel Haber, "The Doctors: A New Model Profession and Its Emulators," chapter 10 in *The Quest for Authority and Honor in the American Professions, 1750-1900* (Chicago and London: The University of Chicago Press, 1991), 324.

consider American medicine and its history;⁸ Billings wrote the last installment, "Literature and Institutions." In this article, he called to physicians to become contributing members of a scientific medical profession:

Besides his duties to his patients, the physician is under certain obligations to contribute, by way of interest, his quota to the common stock of medical knowledge from which he has drawn so freely. The skilful diagnosis, judicious medication, or bold and successful operation, if not properly recorded, benefit the individual only, not being available for those comparisons and higher generalizations which alone can make medicine a science. By the manner in which this duty. . .has been performed, the medical profession of this country, as well as the individual physician, must to a great degree be judged, and the question now presented is, to what extent and in what manner have the physicians in the United States fulfilled this part of their professional obligations during the century just passed.⁹

Billings answered his question of how physicians fulfill their responsibility by first providing a brief history of publications by American physicians and then assessing the state of U.S. medical literature and education. As part of his assessment, he characterized three classes of physicians in the United States: those motivated by science, those motivated by money, and the simple practitioners. Of the most esteemed physicians, those motivated by science, Billings remarked that "[w]e have had, and still have, a very few men who love science for its own sake, whose chief pleasure is in original investigations, and to whom the practice of their profession is mainly, or only, of interest as furnishing material for observation and comparison." Billings observed that physicians "who love science" were rare and "found for the most

⁸ The first in the four-part series was E.H. Clarke, "Practical Medicine," second H.J. Bigelow, "Anesthesia," and the third, T.G. Thomas, Obstetrics and Gynecology."

⁹ John Shaw Billings, "A Century of American Medicine, Literature and Institutions," *American Journal of the Medical Sciences* 72 (1876), reprinted in Frank Bradway Rogers, *Selected Papers of John Shaw Billings* (Medical Library Association Publication, 1965), 24.

part only in large cities where libraries, hospitals, and laboratories are available for their needs." Needless to say, these were also facilities in which photography would play a big role. And, finally, Billings lamented, "Of the highest grade of this class we have thus far produced no specimens; the John Hunter, or Virchow, of the United States has not yet given any sign of existence."¹⁰

Physicians who were motivated by money, those who took up medical practice in pursuit of wealth and social position,¹¹ according to Billings, comprised "a much larger class of physicians," than did the class comprised of those motivated by science. Billings described the physicians motivated by money as,

. . . clear-headed, shrewd, practical men, well educated, because "it pays," and for the same reason they take good care to be supplied with the best instruments, and the latest literature. Many of them take up specialties because the work is easier, and the hours of labour are more under their control than in general practice. They strive to become connected with hospitals and medical schools, not for the love of mental exertion, or of science for its own sake, but as a respectable means of advertising, and of obtaining consultations. They write and lecture to keep their names before the public, and they must do both well, or fall behind in the race. They have the greater part of the valuable practice, and their writings, which constitute the greater part of our medical literature, are respectable in quality, and eminently useful.¹²

Billings does not, therefore, entirely disregard this class, but does indicate that it is a moral low-ground for medical practice, stating that "[t]hey work for the present, and they have their reward in their own generation." Thus, the

¹⁰ Ibid, 72-73.

¹¹ For a further discussion of the economic forces that helped shape medicine's structure at this time, see Paul Starr, "Medicine, Economy and Society in Nineteenth-Century America," *Journal of Social History* 10:4 (Summer, 1977), 588-607 and Charles Rosen, "Competition in the Medical Market: The Need for Rationalization and Regulation, 1875-1910," chapter 1 in *The Structure of American Medical Practice 1875-1941* (Philadelphia: University of Pennsylvania Press, 1983).

¹² Billings, "A Century. . .," 73.

higher moral ground is that of the “. . . few men who love science for its own sake. . .”¹³

Finally, the simple practitioners were a “large class, whose defects in general culture and in knowledge of the latest improvements in medicine, have been much dwelt upon by those disposed to take gloomy views of the condition of medical education in this country.” These physicians, according to Billings, had defective medical educations, either from “lack of desire” or “lack of opportunity.” Their knowledge and skill, for the most part, was accumulated from practice, and they did not add much to the body of medical knowledge as a whole. However, he noted, “[o]ccasionally they contribute a paper to a journal, or a report to a medical society; but they would rather talk than write, and find it very difficult to explain how or why they have succeeded, being like many excellent cooks in this respect.”¹⁴ Billings stated that this final group comprised a necessary component to medical care in the U.S. because they provide medical care to sparsely populated areas. The other two classes of physicians, “. . . [the doctor] who has spent six years in obtaining a University education, and four more in the study of medicine as it ought to be studied, that is to say, in preparing himself to study and investigate for the rest of his life, will not settle in certain districts. . .”¹⁵, those districts with small populations and limited institutional resources.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid, 74.

Finally, in a benevolent summary of the state of medical practice in the United States, Billings wrote that “. . .defects in American medicine are much the same as those observed in other branches of science in this country. . .”

However, he calls for physicians to work toward a practice of medicine that is a scientific:

We have no reason to boast, or to be ashamed of what we have thus far accomplished; it has been but a little while since we have been furnished with the means of investigation needed to give our observations that accuracy and precision which alone can entitle medicine to a place among the sciences properly so called. .

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In his search to increase the practice of medical science in America, Billings would turn to the new technology of the photograph. His voice thus serves to open this dissertation because of his important stance as an advocate of the scientific practice of medicine and his use of photography to this end. Finally, photography had its own historical involvement with science that medical practitioners would find salient in their cause.

Billings was thus a key figure in the move toward science in American medicine and an example of his use of photography toward that end is detailed in chapter two of this study. Furthermore, his expression of these ideals for American medicine exemplified the morally righteous status that scientific medicine began to assume in the United States in the late 1870s. Photography, as an arbiter of observation and mediator of subjectivity, played an important role in the practical pursuit of scientific definition and validity in medicine at this significant historical point.

¹⁶ Ibid, 75.

Prior to the development of mechanical shutters and the dry plate, medical practitioners utilized photography for its value as a descriptive tool, but infrequently because of its strenuous technical demands. Still, it is significant that from its inception, photography was used by physicians from the time of the introduction of the daguerreotype in 1839. This has been detailed at length by Dr. Stanley Burns in his survey and collection of early medical photography. Burns wrote a bulky (but for our purposes, superficial), study of medicine's use of photography from photography's introduction in 1839 until 1883. He termed this period 'early medical photography,' which takes place before the widespread use of the dry plate. His project to study early medical photography, as published in the *New York State Journal of Medicine*¹⁷ and later compiled in book form,¹⁸ sets out to locate every published use of photography by physicians from its invention in 1839 until 1883, the date he ascertained as marking the "year dry plate photography came in to general use, thus beginning the modern era of photography."¹⁹ Burns's interest in these processes is itself part of the phenomenon this dissertation aims to study. His involvement with

¹⁷ Stanley B. Burns, "Early Medical Photography in America I: History of Photographic Processes," *New York State Journal of Medicine* (April 1979), 788-795; "Early Medical Photography in America II: Physicians and Early Photography" *New York State Journal of Medicine* (May, 1979), 943-947; "Early Medical Photography in America III: The Daguerrean Era," *New York State Journal of Medicine* (July 1979), 1256-1268; "Early Medical Photography in America IV: Early Wet Plate Era," *New York State Journal of Medicine* (November 1979), 1931-1938; "Early Medical Photography in America V: Beginnings of Psychiatric Photography," *New York State Journal of Medicine* (February, 1980), 270-282; "Early Medical Photography in America VI: Civil War Medical Photography," *New York State Journal of Medicine* (August 1980), 1444-1469; "Early Medical Photography in America VII: American Medical Publications with Photographs," *New York State Journal of Medicine* (July 1981), 1226-1264. This study by Burns is especially useful in that he investigated all of the American medical journals and publications from this period and published a list of all photography found in them.

¹⁸ Stanley B. Burns, *Early Medical Photography in America (1839-1883)* (New York: The Burns Archive Publishers, 1983).

¹⁹ Burns, "Preface," *Early Medical Photography in America*. . .

photographers and medical discourses of the photographic image is the focus of chapter 4.

As Burns suggests, the proliferation of the use of dry plate photography does indeed change the nature of the use of photography in medicine. The development of mechanical shutters in the 1880s was a direct result of the faster emulsions of the dry plate and an additional important factor in the history of medicine's use of photography.²⁰ These two related innovations signaled a change in photographic practice in medicine from one of description to one of action. That is, where once the slow, cumbersome process of photography could only visually *describe* the discipline, with the new emulsions and shutters, photography began to take an active part in the process of medicine's scientific investigations.

Photography became a primary tool for these physicians, to be employed in the act of investigation. With the possibilities presented by the mechanical shutter and new photographic emulsions, medicine devised uses for photography that allowed the camera to function as a mechanical observer. Physicians used the camera to collect and contain data for further consideration and dissemination. The camera seemingly could produce a visual object that was, in and of itself, a piece of scientific data; prior uses of photography simply allowed the physician to provide a visual description of his practice of medicine.

²⁰ Prior to the development of the mechanical shutter, removing the camera's lens cap and then replacing it exposed the plate. This worked well for slow plates that required long exposure times. However, in order to achieve exposures of fractions of seconds, a mechanical shutter was necessary. The first shutters were simply add-ons to the front of the camera lens. They were activated by a string or pneumatic cylinder with a rubber bulb. See Naomi Rosenblum, "A Short Technical History: Part II," 446-7.

Moreover, the speed of photographic intervention – with the new plates and shutters – presented the possibility that the camera might be able to “see” what the physician could not. This possibility had an even more profound impact on medicine, and as new photographic technologies developed their medicalization became ever more complete. I will examine these effects by looking at three prominent and consistently noted technological innovations based on the camera’s new abilities to “see” in medicine: instantaneous photography, composite photography and x-ray photography.²¹ These roughly chronological developments constitute successive modes of medicine’s producing itself as a science through the literal mediation of the photograph.

Dr. Burns’s chronicle of early medical photography from 1839 until 1883, features photographs that range in subject matter from portraits of physicians, to physicians performing clinical routines to before-and-after treatment images of patients. All of these images are descriptive images – they visually describe the

²¹ These categories were derived from the study of American scientific and medical journals from 1870 to 1900. The journal *Science* proved especially useful because it provided an overview of most of the important writings from other medical and scientific journals. It presented summaries and reprints of significant findings and so the most notable articles and findings from contemporaneous journals were noted in *Science*. This essentially provided a roadmap of late nineteenth century uses of photography by medicine. Stanley Joel Reiser also notes the emergence of motion studies and composite photography in medicine in the late nineteenth century due to the development of dry plates; he credits Muybridge’s motion study for prompting further interest in photography by physicians. Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978), 57. For a survey of the use of photography in medicine in the nineteenth century, in addition to Burns’s study, see Alison Gernsheim’s two-part article, “Medical Photography in the Nineteenth Century, Part I” *Medical and Biological Illustration* (April 1961), 85-92, and “Medical Photography in the Nineteenth Century, Part II” *Medical and Biological Illustration* (July 1961), 147-156. For a discussion of British and American medical photography, see Fox, Daniel M and Christopher Lawrence. *Photographing Medicine, Images and Power in Britain and America Since 1840* (New York: Greenwood Press, 1988). I am in no way attempting to provide a historical survey of the application of photography in medicine, but instead am working to illustrate the impact that photography had on medicine in its efforts to construct itself as an authoritative, scientific discipline and to assess the success of that construction by examining the contemporary importance of medicine on defining images of the human body.

practice of medicine. They are not connected to the treatment of the patients (except possibly as proof of successful medical intervention) nor are they a component of medical research.²² Both Burns's 'early' medical photography, and later photographs that reflect attempts by medicine to engage in scientific production, have some functional similarity in terms of defining medicine as a profession. However, this dissertation underlines their differences and argues for the profound effects of an "active" use of photographic vision *as* scientific practice in and of itself. The following chapters, which move through an artist's motion studies (Eadweard Muybridge), a physician's racialized composites (Dr. Billings), and a radiographic technician's medical aesthetic (Elizabeth Fleischmann), reveal the driving force of medicine's desire for objectivity and the physician's desire for a machine to mediate intersubjectivity during scientific investigation. These types of medical photography all serve to promote the medicalization of the human body; they work to give medicine authority over the determination of the *meaning* of the body, both as it is represented photographically and as it exists in the world as a subject.

In my dissertation, I consider three related problems: one, how is photography utilized to construct a scientific medical discourse in the late

²² One exception is dermatology, which seemed to present the diagnostic potential of photography before improvements of the dry plate and mechanical shutters. The sensitivity to blue and violet of early photographic plates, according to Alison Gernsheim, created a tool for dermatology in that "the texture of the skin was rendered with greater detail," and, in at least one case, foreshadowed photography's utility in medical inquiry. Gernsheim writes that "Hermann Wilhelm Vogel, pioneer of colour sensitizing of photographic emulsions, reported the case of a woman who went to be photographed in 1864: to everyone's amazement her portrait turned out covered with black spots. A few days later she died of smallpox. The disease had been detected by the photographic plate before it became visible to the eye." See Alison Gernsheim, "Medical Photography. . . , Part II" 147-8.

nineteenth century; two, how does medicine, in constructing a scientific discourse, historically assume, and continue to assert, authority over the *meaning* of the human body (the medicalization of the human body); and three, how does photography alleviate the burden of individual subjectivity that can confound the idea of scientific objectivity for the physician.

My use of the terms object, subject, and subjectivity are all components of a theory of intersubjectivity that is defined primarily by psychoanalytic theories of object relations.²³ Object relations theory is a way of understanding how individuals interact with one another, the intersubjectivity of multiple subjects. I view medical practice as an “intersubjective field,” defined as “. . . a system formed by the reciprocal interplay of two (or more) intersubjective worlds. . .”²⁴

My subjects are the physicians, the photographers, and the patients.²⁵ Obviously, the physician maintains the most power in representation. As the

²³ My understanding of object relations is framed by the work of Fairbairn and his followers as opposed to Melanie Klein and her followers. The basic difference is that the Kleinian school of thought was complicated by the need to maintain an allegiance to Freud. The Kleinian school of thought remains drive-oriented, while the Fairbairn school of thought is person-oriented. For a brief overview of the development and structure of the two camps and brief discussions of various individual contributions to object relations theory, see Robert Rogers, “Drive Versus Person: Two Orientations,” chapter 1 in *Self and Other, Object Relations in Psychoanalysis and Literature* (New York and London: New York University Press, 1991), 3-22. For a more detailed historical and theoretical overview of Fairbairn and object relations, see James S. Grotstein and Donald B. Rinsley, eds., *Fairbairn and the Origins of Object Relations* (London: Free Association Books and New York: Guilford Press, 1994). For my dissertation, object relations provides a useful theoretical framework for understanding subjectivity and intersubjectivity in medicine. Object Relations theory, as I use it, is based on a subject’s need to relate to other subjects as objects and here, that desire is the doctor’s desire for the body as an object of medical inquiry.

²⁴ Robert D. Stolorow and George E. Atwood, *Contexts of Being, The Intersubjective Foundations of Psychological Life* (Hillsdale, NJ and London: The analytic Press, 1992), 4.

²⁵ I use the term patient loosely to define any subject of the medical gaze. In many ways, these subjects as I am writing them are my object-representations. I do not wish to place myself, or to seem to place myself, outside of my own construction as the viewer of these subjects. I am aware that finally it is only my subjectivity that I am revealing here by interrogating the intersubjective field of late nineteenth century medical discourse; but I can still hope to generate some useful historical narrative from my own subjective, situated view.

author of the text and photographs,²⁶ he constructs both of my subjects: the patient and the physician. Narrative case studies, written by the physicians and attached to the photograph, are the primary source of my knowledge of the physicians and the patients. The patients exist as subjects only in my reading of the physician's narratives and photographs. Their potential existence as self-defined subjects has long been eradicated,²⁷ but I attempt to construct a plausible general subjectivity for patients of medical care at this time. The physicians only exist textually as well, but they benefit from the power of their own authorship. I use the physician's narrative in an attempt to understand what potential threats subjectivity posed, how the *individual* body threatened objective medicine, and to understand how subjectivity, through the use of photography, was finally subsumed by objectivity.

In terms of intersubjectivity and object-relations theory, I attempt to uncover the history of the physician's use of the patient-subject as his object. Collectively, the chapters of this dissertation will assert that patients became medicine's objects largely through the use of photographic representation. I use object relations theory to understand how photography is utilized to mediate burdensome subjectivity and enable the discursive creation of a disciplinary

²⁶ I call the physician the author of the photographs even though in some cases, as with Fleischmann's x-rays, the physician did not actually make the photographs. It is his authority that defines the making of the image and the discursive value of the image. In the case of Fleischmann, she is constructed mostly by the narrative of the military physicians for whom she worked.

²⁷ I use the term subject, as defined by Rycroft, "person whose experience and behaviour are under consideration." Charles Rycroft, *A Critical Dictionary of Psychoanalysis*, 2nd ed. (London: Penguin Books, 1968), 175. In no way am I suggesting that I can actually know anything about these patients outside their construction by the physician as objects of medical inquiry or their mobilization as subjects by the medical text. I use the patient's textual subjectivity, as I imagine it, to construct a possible collection of techniques that were utilized to eliminate subjectivity in the service of a scientific practice of medicine..

object for medicine. In psychoanalytic terms, the subject creates his objects by internalizing representations (object-representations) of other subjects in the world from whom he desires something. The object is a subject's *internalized representation* of another subject. The subject then interacts internally with the object *as if it is a subject in the real world*. In my study, the subject (physician) creates objects by photographing another subject (patient) from whom something is desired.²⁸ The desire is for a fixed object of inquiry that can be manipulated, without intersubjective uncertainties, to produce knowledge. Thus, the photograph, as a figure for the subject, becomes the object, and it functions psychically as though it were seamlessly interchangeable with the actual subject photographed. The photograph, unlike a single subject's internalized objects, exists in the world, but I would argue it is internalized by a professional discourse. It therefore functions as an internal object for the discipline of medicine.

My mobilization of theories of intersubjectivity to analyze medical photography is further influenced by the work of Donald Spence.²⁹ Spence

²⁸ This diverges from Freudian theory of libido theory and ego psychology. Robert Rogers "a theory of motivation and conflict [built] on the foundation provided by an attachment theory. . ." The attachment theory of object relations is focused on "human motivation and conflict" and the self's (subject's) multifaceted motivation (not limited to or defined by libido) in its desire for others. And, as Rogers has suggested, I use this conceptualization of object relations theory to "register and process internalized representations of [self], of other, and of the nonhuman environment as it regulates itself and its organism's personal interaction with the outside world." Robert Rogers, "Toward a Unified Theory of Object Relations," chapter 2 in *Self and Other, Object Relations in Psychoanalysis and Literature* (New York and London: New York University Press, 1991), 44-45.

²⁹ Donald P. Spence, *Narrative Truth and Historical Truth, Meaning and Interpretation in Psychoanalysis* (New York and London: W.W. Norton & Company, 1982). Dr. Timothy Davis (Boston Psychoanalytic Institute) directed my attention to this work. According to Davis, this book was pivotal in redefining the nature of narrative and interpretation in psychoanalysis. The book addresses the problem in accepting the analyst's narrative as historical truth and

separates what he terms 'narrative truth' from 'historical truth' in the analytic doctor-patient relationship. Narrative truth is the rhetorical structure that an analyst assigns to a patient's experience; historical truth is the experience as it actually happened. Spence places value on narrative truth for making sense and meaning from a patient's experience, while insisting that narrative truth not be mistaken for historical truth. The analyst creates a fluid, cohesive story for the patient in order to make sense of historic events in the patient's life. The historic (or experienced) events do not necessarily have narrative cohesiveness or structural, teleological order. Instead, the patient's experience is often chaotic, unstructured, and potentially meaningless. It is the job of the analyst to help the patient make sense of her/his experience. This is facilitated by the narrative tradition of psychoanalysis³⁰ and a general need to order experience. The *interpretation* created by the analyst's narrative, according to Spence, is most often accepted as an accurate rendition of the patient's history:

Interpretations are persuasive, as we shall see, not because of their evidential value but because of their rhetorical appeal; conviction emerges because the fit is good, not because we have necessarily made contact with the past.³¹

deconstructs the conceptualization of the analyst as objective observer/interpreter of a patient's reported experience. Instead, Spence conceptualizes two related categories of 'truth,' narrative and historical. Historical truth is the event as it actually happened and was experienced by the patient and narrative truth is the meaning and form given to the event by the therapist and patient in psychoanalysis. While the actual experience in historical terms can never be regained, the narrative truth arrived at in analysis is crucial in giving formal narrative structure to the experience in order to make meaning.

³⁰ The narrative tradition in psychoanalysis originates with Freud. Critics of Freud have discussed his use of rhetoric as a device for assuring that his proclamations had weight, relying on the power of his authority rather than presenting evidence. See Donald P. Spence, *The Rhetorical Voice of Psychoanalysis, Displacement of Evidence by Theory* (Cambridge and London: Harvard University Press, 1994).

³¹ Spence, *Narrative Truth*. . . ,32.

Narrative is crucial in my argument about medical photography; the physician's narrative is accepted as the actual only meaning of the medical photograph. In detailing the "compelling" nature of narrative, Spence locates a problem in psychoanalytic literature of idealizing the analyst's report as unbiased and singular; he argues that this "makes no provision for alternative explanations of the same data." Spence illuminates an essential problem in psychoanalytic literature and thinking – that the analyst's conceptualization of the patient's history *is* the patient's history. It is this power of narrative – specifically, the power of narrative's "rhetorical appeal" to confound multiplicity in interpretation – that is central to my examination of photographic practice in late nineteenth century medicine. Medical photographs are confined by the physician's *narrative* that tames the unstable subject, the physician's patient. Moreover, photography is not merely *part* of a narrative, it is powerfully constitutive of it. The photograph functions as if it is the visual equivalent of the physician's interpretation, affirming the veracity and stability of the narrative.

Medicine as a whole, of course, is primarily a narrative tradition³² and here again, the physician's narrative, the case history, is often assigned the

³² For a study of the contemporary use of narrative by physicians, see Kathryn Montgomery Hunter, *Doctors' Stories, The Narrative Structure of Medical Knowledge* (Princeton: Princeton University Press, 1991). Hunter details the narrative tradition that is very much integral to the teaching and practice of medicine. Her account is derived from her observations as a humanities teacher in a medical school. She writes, "Medicine is an interpretive activity, a learned inquiry that begins with the understanding of the patient and ends in therapeutic action on the patient's behalf. Far from being objective, a matter of hard facts, medicine is grounded in subjective knowledge – not of the generalized body in textbooks, which is scientific enough – but the physician's understanding of the particular patient. . . That physicians are scientifically educated and technologically trained alters not one bit the narrative structure of their practical knowledge. Indeed, the physician's own subjectivity as well as the subjectivity of the patient is controlled by the fixed conventions of medical narrative." (xx) She also notes the continuing tension between science and medicine: "Medicine, for all its reliance on esoteric knowledge and sophisticated

privilege of 'historical truth,' although my argument will be, following Spence, that it is "narrative truth." Photography significantly furthers this objectification of the physician's narrative by functioning as "hard evidence" of the primacy of the physician's interpretation. The medical photograph, as it is employed in the pursuit of scientific authenticity, serves as the container of an attached medical narrative. The photographs that I explore in my dissertation, examples of instantaneous, composite and x-ray photography, all derive their meaning from narratives that are attached to them by the physicians. The assumption, however, is that the photographs contain meaning prior to the declarations of the physicians – that the meaning is inherent in the photograph as a part of its physical structure – and the physician is simply providing a "supplement" which functions ideologically as *the* interpretation of that photograph.³³

I find substantiation of the continuing contemporary privilege of medicine's narrative exemplified in Dr. Burns's captions of his historic medical

technology, is not science. This ought not to be a controversial or even a surprising statement, yet many physicians are likely to find it unacceptable. In the twentieth century, science and the ideal of scientific rationality have played such an important part in medical education and the care of patients that they are now central to our idea of the profession. Scientific advances have given us an almost unassailable confidence in medical efficacy. Epidemiologists and historians of medicine have demonstrated that it was not medicine that improved health and lengthened life in the late nineteenth century but a more productive agriculture, pure water supplies, improved hygiene, and population control. In our own time the incidence of heart disease in the United States has been lowered not by the ingenious techniques of cardiac surgery but by a striking alteration of habits. Yet this epidemiological view of history does not capture our sense of medicine's importance in our lives. . ." (1-2)

³³ Barthes details the unique connotative ability of the photograph and the way in which this relegates text to "a parasitic message designed to connote the image. . ." Barthes claims that, prior to the photograph, "image illustrated the text," but with photography, "the text loads the image, burdening it with culture, a moral, an imagination. Formerly there was a reduction from text to image; today, there is an amplification from one to the other. The connotation is now experienced only as the natural resonance of the fundamental denotation constituted by the photographic analogy and we are thus confronted with a typical process of naturalization of the cultural." Roland Barthes, "The Photographic Message," *Image, Music, Text*, trans. Stephen Heath (New York: Hill and Wang, 1977), 25-26.

photographs, considered in my final chapter. In his captions, Burns again implies the inherent existence in the photograph of *meaning* and imposes upon us that he, as the authoritative viewer, is simply providing us with the appropriate interpretation (as if there is only one).

The photograph is capable of seeming to have inherent *meaning* primarily because of its indexical quality. The photograph can seem to be what it represents – the body that the physician is investigating. However, unlike a real patient, the photographed body does not change, it does not move and it does not complain. The photograph functions as the stable object of medicine's scientific inquiry, but as such is not treated as an image, but as *the* body, as if the body and the photograph of the body were interchangeable. This is how medicine can eradicate the threat of intersubjectivity in its scientific inquiries and maintain authority over the meaning of the human body.

I argue that the use of photography by physicians is a method of reducing and, finally, eliminating subjectivity. Subjectivity is a dual burden to physicians as they are faced with not only their own subjectivity, but also the subjectivity of their patients. Other scientific pursuits were only burdened by the subjectivity of the investigator, thereby making the path to objectivity much smoother; the investigator had only to discipline himself.³⁴ Lorraine Daston and Peter Galison define an objectivity that is useful for my study. As they argue in "The Image of Objectivity," and as other scholars have confirmed, both science and art in the

³⁴ See Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations* (Fall, 1992), 81-128.

nineteenth century developed and sustained ideals of 'truth to nature,'³⁵ and objectivity was the means to this end. Daston and Galison historicize the term as it emerges in science at this time, and argue that there is a moral imperative to the elimination of subjectivity; the elimination of subjectivity and an attention to mechanical accuracy are central to this formation of objectivity. Photography was a ideal tool for this conceptualization of objectivity. In the intersubjective field of late nineteenth century medical practice, the physician turned to a mechanical device, the camera, for mediation. The camera, acting as an autonomous machine, eliminated the subjectivity of the physician, and the photograph, acting as the object of scientific inquiry eliminated the subjectivity of the patient.

Physicians exploited photography's unique features to define the human body scientifically under the rubric of medical authority; photography enhanced and confirmed the visual power of the physician and produced a lasting, unchanging document (the photograph) for further consideration. In addition, the camera was a mechanical device that made it seem as if it could objectively represent the medical subject, while also providing new images that could not otherwise be "seen". Objectivity was of utmost importance to the newly developing medical profession as the physician desired, in his pursuit of the professionalization of medicine, to attain scientific validity.

Science, at this time, prioritized objective observation to validate conclusions. If medicine wanted to be scientific, it had to find a method to

³⁵ For a discussion of truth to nature in 19th century art, see Linda Nochlin, *Realism* (New York: Penguin, 1971).

arbitrate its intersubjective field. Photography enabled medicine to define itself as scientific by apprehending its subject with seeming objectivity. I explore the relationship between medical visualization techniques, artistic convention and the cultural understanding of the body by examining both medical imaging techniques in their infancy and the artistic techniques that help to define and aestheticize medicine's imaging regime. In addition, I reveal the persistence of medicine in defining the body in the cultural imagination and the important role art and photography have played and continue to play in medicine's historical effort to do so. Through the use of photography from its invention to the present, medical discourse has successfully medicalized the human body, that is, defined the human body as a medical object. In my concluding chapter I argue how this medicalized subject infects even "fine art" photography, both trading in a language of body parts that produce the ultimate fragmentation of the human subject.

Beginning with the stethoscope and ending with the x-ray, Stanley Joel Reiser documents a history of technological innovations in nineteenth century medicine that privilege the physician's vision for determining disease and difference.³⁶ Emerging medical technologies of the nineteenth century allowed the physician greater power over identifying and labeling bodies and creating medical subjects without the burden of the subject's narrative. In addition, photography could potentially reveal what even the physician, with only his eyes, could not necessarily see. According to Reiser,

³⁶Reiser, 45-68.

The characterization of the stethoscope as an instrument for “seeing” into the chest revealed a specific desire physicians had developed during the era of auscultation – to inspect the architecture of the internal organs during life with the ease and clarity possible after death. . .³⁷

Reiser views changes in medical technologies as evidence of the medicine’s desire for visualization; I see them additionally as attempts by medicine to relieve itself of the burden of the patient’s subjectivity. As Reiser has written, medicine, as a discipline, was working toward developing a discourse that did not need to rely on the patient for its definition. Medicine did want to “see,” and it was seeking a professionalized vision, free from the intrusion of subjectivity that kept it from coveted status as a science. Vision, particularly photographic vision, allowed apprehension without physical contact.

The development of the stethoscope as a machine for auscultation described by the doctors as “seeing” into the chest, took the physician one more step away from the burdensome subjectivity of the patient. In auscultation, prior to the stethoscope, the physician would place his head on the chest of a patient and listen in order to ascertain the condition of the heart and lungs.³⁸ This technique at least allowed the physician to make determinations outside of the patient’s narrative; however, the intersubjective field was still charged largely because physical contact was necessary. Moreover, the results of the physician’s inquiry were not in a form that could be dispersed in medical discussions. In

³⁷ Reiser, 45.

³⁸ Milissa Kaufman reminds me that medical students are still taught this technique; and, of course, the stethoscope remains a fundamental accoutrement in every hospital and doctor’s office, decorating the necks of most doctors and nurses.

1816, the invention of the stethoscope³⁹ produced a machine that could mediate between the physician and the patient. It reduced the threat of intersubjectivity and also signaled the potential of scientific objectivity for medicine.

Additionally, despite the fact that this technology was aurally based, the name indicates the privileged status of a distanced, observational vision: the term stethoscope combines the Greek word “stethos” which means chest with the word “skopos,” to see (or spy). The priority of establishing a distanced medical “vision” of the patient was established before photography would make such a vision both possible and unimpeachably scientific.

Epistemological constructions are made from generalities, from the collection of data, and from the delivery of conclusions; medicine’s problem, in terms of the pursuit of scientific knowledge, had always been the specificity and subjectivity of its proposed object: the human body. In order to create the object of its inquiry, the medical subject, individual subjectivity needed to be subverted in the pursuit of the general, quantifiable body. Medicine’s object became the human body confined by a discourse that erases subjectivity. This human body, the *medical* subject, must be unidentifiable as an *individual* subject, but completely identifiable as a medical object by medical authority.

This authority continued to develop in the twentieth century as medical imaging techniques evolved. Medicine has become a pervasive authority over the human body; medical images are common in contemporary culture and the

³⁹ The credit for the invention of the stethoscope, originally a short, wooden tube, in 1816 is assigned to Rene Theophile Hyacinthe Laennec. In 1819, Laennec wrote a treatise on his invention, *De l'auscultation mediate* (Paris: Chez J-A. Brosson and J. -S. Chaude, 1819). A flexible tube replaced the wooden tube in 1843 and by the binaural model in 1852. See Reiser for further discussion of the development of the stethoscope.

medical definition of these bodies as *both* subjects and image objects is naturalized – it remains unquestioned and perceived as reality. The medical image is not the individual and yet, the image and the person imaged become interchangeable in the accepted medical narrative.

Photography played a crucial role in cataloging and establishing categorical distinctions of ‘normal’ and ‘pathological’ in medical epistemology. The pursuits of medicine in the nineteenth century were enabled and aided by the visualizing power of photographic imaging. The mechanism of photography allowed medicine a lasting, specialized⁴⁰ document (the photograph) that could be studied and shared with colleagues. Images of doctors around the x-ray lightbox are staples of television programs as well as hospital grand rounds. It is in this shared professional intimacy with a shared object (the body as it is imaged) that medicine wields ultimate power over the body’s general definition, overwhelming individual subjectivity, and constructing medicine’s object.

In my first chapter, I examine ‘instantaneous’ photography as Eadweard Muybridge utilized it for motion studies from 1884 to 1885 at the University of Pennsylvania. Muybridge’s enormous study of motion, *Animal Locomotion*,⁴¹ remains an important example of the interaction of the principals of science and the aesthetics of art in an attempt to define and differentiate types of human bodies. ‘Instantaneous’ was a widely used term and its potential was noted often

⁴⁰ I use the term specialized here to indicate the authority of medicine in reading these images, not to mean a specific technological specialization and not to imply that these photographs differed physically from any other photographic images. I do not mean that medicine had a defined specialized ‘look’ in the nineteenth century and indeed believe that photography was crucial in aiding medicine to attain a goal of professionalization and specialization.

⁴¹ Eadweard Muybridge, *Animal Locomotion, An Electro-Photographic Investigation of Consecutive Phases of Animal Movements* (Philadelphia: J.B. Lippincott Company, 1887).

in medical and scientific journals.⁴² Instantaneous described the ability to make images with very short exposure times, thereby freezing an 'instant' in time. The notion of 'instantaneous' photography is the most obvious result of the development of faster, dry photographic emulsions and advanced camera systems with timed, mechanical shutters. Indeed, Muybridge devised an electro-magnetic shutter specifically for his project. The potential of short exposures caught the imagination of the medical establishment because it allowed the possibility of revealing something about the body in that fractional exposure that the naked, human eye might otherwise miss. As I have noted, prior to the implementation of these developing technologies in photography, medicine utilized photography mostly to describe itself.⁴³

⁴² Instantaneous photography was the term used both in the scientific press, art and popular culture to describe the new possibility of making exposures of fractions of seconds, thus freezing an 'instant' of time. Rosenblum defines it as "a term used loosely in the early days of photography for exposures of less than one second." (630) For a general discussion, see Rosenblum, 259-75. *Science* is filled with various articles on instantaneous photography from 1880s through the 1890s. For example, an article in 1886 refers to the "novel and interesting applications of instantaneous photography to the study of the movements of the heart and intestines" by Dr. W. G. Thompson who had apparently photographed the hearts of rabbits, pigeons, cats and frogs. (March, 1886), 264. And, Professor W.D. Holmes "of the photographic laboratory, Lehigh university [sic], offers a prize of fifty dollars for the best instantaneous shutter. . ." (November, 1885), 476. In 1890, there were a series of "Instantaneous Photographs of an Athlete Throwing a Javeline." (February, 1890), 83-86.

⁴³ Physicians were among the first to take up photography. Because of the extended exposure and processing time required in early photography (daguerreotype and wet-plate processes), it was not always entirely practical to attempt to mobilize photographic representation in the day to day practice of medicine. However, many physicians did employ photography to document an interesting or unusual case or to document medical practice. In my last chapter, I deal with one such daguerreotype from 1844, which is an image of a dissection of a cadaver. Cadavers were easy early medical subjects because they did not move during the exposures. As you will see, however, the physicians photographed with the cadaver were not so reliable. The first large-scale deployment of photography in medicine was during the Civil War. The process (wet plate) was very cumbersome and required photographic laboratories that traveled in wagons to each hospital scene. The military organized the photographic units and determined that war wounds should be documented. Therefore, a large compendium of Civil War wound photographs are extant. Stanley Burns owns an extensive number of original albums of Civil War photographs made by the surgeon Reed B. Bontecou. He plans to publish a book on the photographs. The Army Medical Museum published a six volume tome of the photographs made during the Civil

For my discussion of instantaneous photography in medicine, I examine a volume from *Animal Locomotion* by Eadweard Muybridge and several physicians at the University of Pennsylvania hospital called “Abnormal Movements.” This volume is an outstanding instance of the utilization of techniques from both science and art in the construction of a medical object. This particular volume was instigated and defined by a physician, Dr. Francis X. Dercum, who also provided written case studies for each of the patients photographed. These subjects were either patients at the University hospital or otherwise constructed by the physicians as pathological.⁴⁴ Dercum collaborated with Muybridge to create the photographic plates of this volume, providing the subjects and directing Muybridge’s compositions. Dercum, along with his medical colleagues, provided extensive written case histories of the patients imaged. Therefore, I examine these images in conjunction with the published medical case histories to reveal an emergent medical discourse. The discourse enables the photograph to stand as an autonomous object of inquiry, separated from the body and subjectivity of the patient.

This work remains an important marker in American medicine’s attempts to eradicate its intersubjective field. It is the physician’s narrative that finally gives meaning to Muybridge’s sequences in “Abnormal Movements,” and yet,

War, George A. Otis, *Medical and Surgical History of the War of the Rebellion*, according to Burns, “two printings of 5000 each were published: Surgical section, volume I in 1870, volume II in 1877, and volume III in 1883; Medical section volume I in 1870, volume II in 1879, and volume III in 1888.” Stanley B. Burns, “VI. Civil War Medical Photography,” *New York State Journal of Medicine* (August 1980), 1453. For additional discussion of Civil War photographs, see Kathy Newman, “Wounds and Wounding in the American Civil War: A (Visual) History,” *The Yale Journal of Criticism* 6:2 (Fall, 1993), 63-86.

⁴⁴ Most of the photographed subjects were patients, but two were amputees and one was a model who was subjected to “artificially induced convulsions.”

the photographs are presented as if they contain the meaning of the body. I examine the textual narratives of the pathological subjects photographed by Muybridge, including one who was not a patient, but a model exhibiting *artificially induced* spasms for the camera. The extensive published materials on these individuals clarify how important the physician's narrative becomes in assigning meaning to a medical photograph. Medical discourse would have us believe that meaning is inherent on the body and on the imaged body, thereby confirming the validity of the physician's authority in *reading* that meaning; however, the physician's account actually applies the meaning to the photographic object.

The motion images produced for "Abnormal Movements," are, except for two plates depicting amputees, representations of hysterical affect – what the physicians place under the rubric of 'functional disorders'.⁴⁵ The use of motion photography by a physician to attempt visually to define this pervasive and elusive nineteenth century affliction evidences a conflict of medical discourse: the tension between the general and the specific. Medicine is confined by the specific in defining its general theories. The physician is forced to engage with a specific body and extract a general concept from that specific body; this is antithetical to scientific practice. Photography was essential to medicine, allowing it to create a generalized object from a specific body.

While the application of 'instantaneous' photography was widespread, Muybridge's employment of the technique is the most extensive, comprising 11

⁴⁵ Functional disorders was another term for nervous disorders, specifically those nervous disorders that supplied an external bodily affect as a symptom of their existence.

volumes and 781 plates. This is an enduring example of instantaneous photography, as it continues to receive critical and popular attention over one hundred years after its publication. Historical considerations of Muybridge continue to place him at both ends of a construction of an art – science binary opposition. Scholars have positioned him either as the ‘scientific’ counterpart to Eakins’s art⁴⁶ or, conversely, the ‘art’ counterpart to Marey’s science.⁴⁷ Through the Muybridge work, we can begin to see that there is an absence of distinct oppositional science and art categories in the late nineteenth century. In fact, I will argue throughout this dissertation that such binaries are misleading, particularly where such mutually legitimating regimes are at play. Thus, in the Muybridge motion studies, both artistic conventions and scientific objectivity are mobilized by medicine in order to construct a discourse. The Muybridge sequences in “Abnormal Movements” illustrate an attempt by physicians to create a static, fixed subject; the photograph functions as a medical object, which would aid in the epistemological construction of rigid categories of ‘normal’ and ‘abnormal,’ or ‘normal’ and ‘pathological.’

In the second chapter of my dissertation, I examine the practice of composite photography as it was utilized by Dr. John Shaw Billings. Again, examples of composite photography are readily available in medical and

⁴⁶ Mary Panzer, “Photography, Science and the Traditional Art of Thomas Eakins,” *Eakins and the Photograph, Works by Thomas Eakins and His Circle in the Collection of the Pennsylvania Academy of the Fine Arts*, eds. Susan Danly and Cheryl Liebold (Washington and London: The Smithsonian Institution, 1994), 95-115.

⁴⁷ Marta Braun, *Picturing Time: The Work of Etienne-Jules Marey (1830-1904)*. Chicago: University of Chicago Press, 1992.

scientific publications⁴⁸ after Francis Galton's initial publication of the technique in 1879.⁴⁹ Dr. Billings's composites are notable both because they were referenced repeatedly in the contemporaneous literature,⁵⁰ they were esteemed by Galton,⁵¹ and because Billings is such an important and authoritative figure in the history of medicine. Additionally, although his composites reveal an intense dedication to aesthetics, Billings paid diligent attention to insure that they were read as scientifically objective.

Composite photography was a technique in which several photographs, usually faces, were combined to create a single image that could visually display an "average." Galton believed his most successful composite was one he combined portraits of several Jewish boys. In creating this composite, he believed that he created a visual representation of the "Jewish Type."⁵² Composite photography was essentially employed to create a racist delineation of difference. Because the Army Medical Museum had a collection of crania of Native Americans, Billings believed it was his responsibility to study the

⁴⁸ For example, in 1885, *Science* published a number of examples of composite photography including: "Composite Portraits of Members of the National Academy of Sciences," (May, 1885); one of Billings's composite skull photographs (June, 1885); attempts to purify artistic representations by artist's renditions of George Washington (December, 1885). In 1886, among several articles on composite photography, there was a report of the use of composites to test the validity of signatures (January 1886) and a series of composite portraits of Smith College students was published (July, 1886).

⁴⁹ See Francis Galton, "Composite Portraits, Made by Combining Those of Many Persons Into a Single Resultant Figure," *Journal of the Anthropological Institute of Great Britain and Ireland* 8 (1879), 132-144.

⁵⁰ Billings's composites appeared in *Science* (1885), *Memoirs of the National Academy of the Sciences* (1886). Articles on his technique and his craniophore appeared in *Science* (1885) *The Photographic Times and American Photographer* (1886), and *The Journal of the Anthropological Institute of Great Britain and Ireland* (1887).

⁵¹ Galton made reference to Billings's work in "Photographic Composites," *The Photographic News* (April 7, 1885), 244.

⁵² Francis Galton, "Photographic Composites," . . . , 243-46. See also Joseph Jacobs, "The Jewish Type, and Galton's Composite Photographs," *The Photographic News* (April 24, 1885), 268-270.

“divergence of the tribes.”⁵³ Photography, already emerging as a tool of science, furthered the legitimation of such pseudo-scientific inquiries.

As a respected member of the medical community in his time and in historical reconsiderations, Billings serves as a significant practitioner of composite photography. His attention to detail and organization of his technique for making composites is also remarkable. Billings’s interest in the pursuit of scientific medicine further evidences the important role photography played in the creation of medicine’s object. Billings, focused as he was on organization and cataloguing, turned to photography to provide a tool for structuring scientific knowledge of the human body. The ability to measure and categorize was crucial to the definition of a scientific practice of medicine. Billings undertook his extensive photographic study on Native American skulls collected in the Army Medical Museum in 1884. He designed and then re-designed a device for making the composite photographs of skulls. Billings created several composites of skulls from different angles, presented them to the National Academy of Sciences in 1885 and published them in the *Memoirs of the*

⁵³ A newspaper clipping in Billings’s papers from the Wheeling Register, January 17 (no year, but probably 1884), reads as follows: Two Thousand Skulls, An Interesting Visit to the National Medical Museum and Library, Composite Photography Used to Ascertain the Divergence of Indian Races – A “Flower Garden” of Disease Germs – Dr. J.S. Billings’ Great Work “Doctor,” said I with an ill disguised shudder, as together we entered the main room of the museum, “how many skulls have you here?” “About 2,000,” he replied, and a quiet smile played over his face. “What are you doing with them?” “We are making studies of the skulls of the various Indian races by the aid of composite photography,” was the reply, and then Dr. Billings opened a large portfolio and showed me the results of these labors among dead men’s skulls. They were certainly marvelous. From these photographs the inexperienced in such studies could easily select the typical skulls of the different races – the front of the skull, the back, the base, and even the marked differences in the upper jaws were clearly observable. “What is the chief object of this study?” “To ascertain the divergence of the tribes.” John Shaw Billings Papers, New York Public Library, Box 97.

National Academy of Sciences in 1886.⁵⁴ Billings's publication in the *Memoirs National Academy of the Sciences* was comprised of three series of photographs: one, photographs of the device used to make the composite photographs; two, a series of composite photographs of skulls; and three, photographic documentation of a process created by Dr. Washington Matthews, Dr. Billings's assistant, for measuring cranial capacity. In these three series of photographs, the intersection of discourses of art, science, medicine and photography are evident.

With this series of images, I will show that Dr. Billings paid careful attention to divorcing his own subjectivity from the *process* of creating the photographs as well as from the photographs themselves. Dr. Billings's photographic studies clearly illustrate the importance of photography in the physician's attempts to define the boundaries of a profession. He utilized composite photography to create graphical containers for statistical data, relying on statistical methodologies, defined by Quetelet,⁵⁵ that were most esteemed in scientific inquiry. Billings is an important representation of medicine's use of photography to insure its authority and objectivity in relation to the human body.

In the third chapter of my dissertation, I consider the work of Elizabeth Fleischmann, an x-ray photographer, who opened the first California x-ray

⁵⁴ J.S. Billings, "On Composite Photography as Applied to Craniology;" and Washington Matthews, "On Measuring the Cubic Capacity of Skulls," (read April 22, 1885) *Memoirs of the National Academy of Sciences* 3 (1886), 105-16; J.S. Billings and Washington Matthews, "On a New Craniophore for Use in Making Composite Photographs of Skulls," (read November 12, 1885), *Memoirs of the National Academy of Sciences* 3 (1886), 119.

⁵⁵ See Georges Canguilhem, "Norm and Average," in *The Normal and the Pathological* (New York: Zone Books, 1991) 151-227.

laboratory in San Francisco in 1896.⁵⁶ She took up the practice of x-ray shortly after the initial announcement the discovery of the rays in December of 1895,⁵⁷ and continued until her death in 1905.⁵⁸ Fleischmann's practice of radiography is especially compelling because her work was so esteemed by her colleagues, physicians, and the general public.⁵⁹ Fleischmann enjoyed broad success in the popular press, in work for the military, and in professional x-ray societies. Her x-ray photographs, exemplary of the most aesthetically esteemed x-ray photographs at this moment, demonstrate the initial obfuscation of the boundaries between popular and professional discourses of body definition. The x-ray images required physician narrative to discipline them and define them as medical.

X-ray photography played an important role in the further legitimization of the field of medicine as an objective, scientific pursuit. The x-ray provided

⁵⁶ Peter Palmquist, *Elizabeth Fleischmann, Pioneer X-Ray Photographer* (Berkeley, CA: Judah L. Magnes Museum, 1990), 7. Palmquist suggests that Fleischmann's interest in radiology was "influenced and supported by her brother-in-law, Michael J.H. Woof," who was a physician.

⁵⁷ The discovery of the x-ray or Roentgen ray was first reported in the popular press in the *Würzburger Generalanzeiger* in January 9, 1896; Wilhelm Conrad Röntgen discovered the rays and published his first article, "über eine neue Art von Strahlen," *Sitzungsberichte der Würzburger Physik-medice Gesellschaft* 9 (1895), 132-141. News of the rays proliferated in the scientific and popular press. Röntgen's article was translated in *Science*, "On a New Kind of Rays," *Science* 3:59 (February 14, 1896), 227-231. The original article by Röntgen was published in a number of scientific and medical journals. For a history, see Otto Glasser, *Wilhelm Conrad Röntgen and the Early History of the Roentgen Rays* (Springfield, IL and Baltimore, MD: Charles C. Thomas, 1934).

⁵⁸ Fleischmann died on 1905 from "injuries sustained in pursuit of her profession as a radiographer." "Death of a Famous Woman Radiographer," *San Francisco Chronicle* (August 5, 1905), 10. For Fleischmann's biography, see Palmquist, 5-10.

⁵⁹ Her work was included in the inaugural *conversazione* of the British Röntgen Society and one was published in their journal, *Archives of the Roentgen Ray* 3:2 (November, 1898). Her radiographs were exclusively used to illustrate an article on the x-rays in the photography journal, *Camera Craft*, Theodore Kytka, "Radiography," *Camera Craft* (1901); she was featured in "The Woman who Takes the Best Radiographs in the World," *San Francisco Chronicle* (June 3, 1900). Her radiographs were highly valued by the military surgeons at the Presidio during the Spanish-American War and published in W.C. Borden, *The Use of the Röntgen Ray by the Medical Department of the United States Army in the War with Spain (1898)* (Washington: Government Printing Office, 1900).

medicine with another tool that enabled the physician to appropriate the human body for a language of medicine. Additionally, as with the skull composites, x-ray images offered the physician the negation of individual subjectivity by the erasure of the identificatory surface of the flesh in the final photographic image.

The general popularity of the x-ray facilitated the radiography of a variety of subjects that proved aesthetically pleasing. Fleischmann's work presents examples of non-medical subject matter that was commonly radiographed during the x-ray's infancy. Her work with this type of subject matter and the publication of x-ray photographs in photography and x-ray journals illustrate the clearly defined aesthetics of x-ray practice. Ultimately, these non-medical x-ray photographs were exercises to define the potential of the rays and display the prowess of the photographer. The attention to aesthetics in x-ray photographs might seem to complicate the idea of the photograph as unmediated, but it does not. Physicians referred to Fleischmann's abilities to 'reveal' through her excellent technique.⁶⁰ Medicine already 'knew' what was inside and required a specific representation of it to 'reveal', for instance, the exact location of the lodged bullet. The development of skill in making radiographs was a progression toward a pre-existing imagined ideal of representation.

The x-ray provided physicians with another tool for the discursive depersonalization of the human body; however, in order for it to function

⁶⁰ In a newspaper article in the *San Francisco Chronicle*, the military physician, Colonel Forwood, spoke of Fleischmann's skill at adjusting the rays "according to the density or character of the object which she desires to photograph." And noted that, "[w]e have never failed to go straight to a foreign body imbedded in the human anatomy which is shown by her radiographs. . ." "The Woman who Takes the Best Radiographs in the World," *San Francisco Chronicle* (June 3, 1900), 30. It is her skill at creating an exacting image of what was expected by the physician that was so esteemed.

discursively for medicine, physician narrative had to assume primacy over its meaning. The celebration of a woman technician by physicians indicated the comfort provided by her gender. A 'woman who takes the best radiographs' posed little subjective threat to the x-ray photographic object; she simply substantiated the physician's authoritative definition. She was 'best' at performing the technical tasks required to objectify the physician's vision.

In the last chapter of my dissertation, I use the historic medical photography collection of Dr. Stanley Burns, the contemporary work of Joel-Peter Witkin and the collaboration of Dr. Burns and Witkin to explore how medical discourse continues to be pervasive in determining *the* meaning of the human body and body parts. As an internal object of the medical discipline, the medical photograph can be understood by the deployment of that discipline's discourse. In order for the historic photograph to function as if it is an unmediated window on the past, however, it is necessary that the narrative explanation of the image is perceived as if it is *inherent* to the image. I will illustrate with the Burns Archive how the historic medical photograph re-emerges in contemporary culture with its medical definition intact, thus evidencing the power of medicine's rhetoric. The medical narrative, *attached to* the photograph, is construed as the singular meaning *embedded in* the photograph. Additionally, the insidiously convincing narrative of medicine insinuated in these historic photographs, allows the formal components of medical photographs to be further deployed in the fine art practice of Joel-Peter Witkin.

Burns' collection of medical photography is comprised primarily of the descriptive.⁶¹ Burns and Witkin collaborate to deploy the historic material in the Burns Archive as contextual evidence of medicine's history in a book called *Masterpieces of Medical Photography, Selections of the Burns Archive*.⁶² The presentation of these images in this book relies on the assumption that they are windows onto medicine's past. They are presented with an authoritative narrative in the form of a caption written by Dr. Burns. This caption works as a medical translation of the photograph for the general viewer. Dr. Burns, with the support of Witkin's artistic authority, continues medicine's powerful rhetorical tradition that allows the physician's applied narrative to function as if it is the only interpretation of an image. Thus, the medical photograph seems to have a singular indexical relationship to the body photographed.

A reading of Dr. Burns's collection and Witkin's artwork reveals the continued medical authority over interpreting the meaning of the human body.

Both Dr. Burns's collection of historic medical photographs and the

⁶¹ I use the term 'descriptive' here to mean those images which exist because of their ability to display something of interest to medicine and not because they have any diagnostic or evidential value. That is, they were not made to as part of a medical process of diagnosis and intervention (as an x-ray) or medical research (as in composite photography), but were made to describe an event or circumstance of interest to medicine. Interestingly, Dr. Burns goes so far as to include portraits of physicians in his definition of medical photography.

⁶² Joel-Peter Witkin and Stanley B. Burns, *Masterpieces of Medical Photography, Selections from the Burns Archive* (Pasadena, CA: Twelvetrees Press, 1987). The first publication from the Burns Archive materials was the compilation of the series of articles Burns wrote for the *New York State Journal of Medicine*, titled, *Early Medical Photography in America: 1839-1883* (New York: The Burns Archive, 1983). Publications subsequent to *Masterpieces of Medical Photography* by Burns and from the archive include: a chronicle of post-mortem memorial photography, *Sleeping Beauty: Memorial Photography in American* (Altadena, CA: Twelvetrees Press, 1990); a book created with Matthew Naythons and William Styron, *The Face of Mercy and a Study of War Medical Photography* (New York: Random House, 1993), *A Morning's Work: Medical Photographs from the Burns Archive & Collection, 1843-1939* (Santa Fe: Twin Palms, 1998). In addition, Witkin edited a volume that included both images from Burns's archive and captions written by Burns with materials from other archives, Joel-Peter Witkin, ed, *Harm's Way: Lust & Madness, Murder & Mayhem* (Santa Fe: Twin Palms Publishers, 1994).

contemporary artwork of Joel-Peter Witkin disperse photographs of bodies and body parts as narrative containers. Both Burns and Witkin disseminate photographic representations of bodies as components of a complex structure of visual communication unique to their discursive practices. Witkin does this for fine art and Burns for medicine.

In my dissertation, I contend that the medicalized human body is socially constructed, yet seamlessly naturalized. At a defining moment in the history of medicine, physicians worked to use photography to stabilize the human body as the object of its scientific gaze. Now that medicine's authority over the body is defined, medicine uses its objects to culturally define the body as medical. We are directed to perceive medical meaning as inherent in a body rather than applied to a body. Furthermore, medicine's construction of the body is based upon categorizations of normal and abnormal as they can be understood in visual representations. A medical photograph, through the aesthetic of medical objectivity, seems to display inherent meaning that is, in actuality, rhetorically applied by medical narrative.