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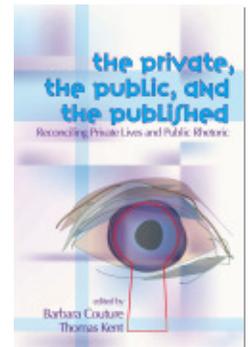
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MARY PUTNAM JACOBI AND THE SPEAKING PICTURE

Susan Wells

Mary Putnam Jacobi was a remarkable nineteenth-century physician and medical researcher. As a writer and speaker, she was always fascinated by the promise and difficulty of seeing the inside of the body, of representing dynamic bodily processes. Since medical illustration is a relatively well-documented field (Cazort, Kornell, and Roberts; L. Dixon; Herrlinger; Jordanova; Petherbridge and Jordanova; Roberts and Tomlinson; Rousselot; Stafford, *Body Criticism*), an analysis of Jacobi's practices of visual representation can help us trace the relation between her personal absorption in such images and the ways they are used to construct scientific facts.

We can conveniently begin by recalling two stories Jacobi told about failed encounters with the human heart. Jacobi dated the beginning of her medical career from a discovery she made in the family stables at the age of nine. The discovery is reported in a family memoir, written in 1902:

I found a big dead rat and the thought occurred to me that if I had the courage I could cut that rat open and find his heart which I greatly longed to see. I had it in the corner of the stable but in the course of the day, thinking of this my courage failed me but with the sophistry of childhood I didn't propose to back out of this venture on my own initiative but put the responsibility on my little mother as often afterward. That evening I told my mother what I proposed to do hoping to elicit an expression of admiration at my daring. Instead I only aroused her fright and disgust and she promptly forbade me to touch the rat. I professed great disappointment but I was secretly [excessively?] relieved at the forcible delay of my anatomical studies. (autobiographical manuscript 5)

Not until Mary Putnam had persuaded her parents to let her leave home and attend medical school at the Women's Medical College of

Pennsylvania would she be sanctioned in her desire to see inside the body and learn what those images might say to her about health and sickness.

Jacobi wrote her second story of an inaccessible heart some seventeen years after her discovery of the rat, in 1868, while she was a medical student in Paris. Paris had provided Jacobi with a densely woven fabric of connections, linking her scientific and political interests with her personal life. So close were these connections that, for Jacobi, privacy and publicity were mutually determinative. Her politics, her friendships, her very presence in the medical amphitheater were all interdependent. In Paris, Jacobi was a very busy young woman, attending all of the lectures she could manage and writing extensive anonymous reports on Parisian medicine for the New York *Medical Record*. Of these reports, medical historian John Harley Warner observes: "It is quite possible that Putnam, during her time abroad, wrote more on Paris than any other nineteenth-century American physician—in private letters, in professional journals, in popular periodicals, and in newspapers" (328). Her interests were not limited to medicine: she participated in the politics of the Commune and supported herself with additional journalism, and, in her spare hours, wrote fiction and political essays. Within that context, Jacobi's short story "A Martyr for Science" returned to the theme of the hidden heart.

In this story, a physician mourning his wife and child becomes fascinated by his own death and undertakes a project of opening his own chest to display his beating heart. He trains a young medical student and pressures him to comply with the project: the physician will be paralyzed with woorara; his chest will be opened with acid cautery (a process expected to take several days); and his heart will be exposed, for at least a short period. The student will therefore become the first person to study the action of a beating heart. The heart itself is understood, and presented to the reader, as mysterious, tantalizingly close but irreducibly invisible. In its published form, the story ends with the student consigning his mentor to an insane asylum—the youth, like Mary Putnam's disgusted mother, stands between a potentially self-destructive desire to see and the desire's object. Seeing, for Jacobi, carried the thrill of the forbidden; in these stories, the heart, never seen in life, can be invoked verbally.

Jacobi was not the first person to puzzle about the relation between word and image. Since the Renaissance, an exceptionally vivid or provocative picture was seen as "speaking," while a very good poem could hope to work on the reader's imagination as if it were a picture,

ut pictura poesis. And some of the more interesting forms of visual culture—emblem books that juxtaposed pictures with poems, allegorical paintings, book frontispieces, map cartouches—as well as a group of very interesting literary genres—place poems, shaped poetry, travel writing—investigate these boundaries between text and visual representation, between delight and instruction. While the concept of the speaking picture risks reducing words and images to a thematic lowest common denominator, it also draws our attention to the connections between words and images, to their specificity as forms of representation. Medicine has traditionally explored those boundaries: the sixteenth-century emblem books often included images of the heart or the skull that anatomists reworked for their own books, adding new mottoes and explanatory texts (Cazort, Kornell, and Roberts 30). Nor is the idea of a speaking picture completely archaic: in John Law and John Whittaker's account of how they designed a graphic representation of current research on acid rain, they speak of the need to make a picture that would, "so far as possible, make some qualitative sense . . . [; the image] should, as it were, 'tell a story'" (168).

Medical writing has drawn on what Simon Schaffer calls "literary technologies," which include "the design and use of instrumentation, the social organization of the scientific community and the assignment of credit and status," to give verbal representations the force of images: these mediating devices seemingly transform the text into a direct representation of the working of nature. Such technologies "help fashion the bearer of knowledge as authoritative and competent, and the item of knowledge as independent from the contingencies of human judgment." According to Schaffer, literary technologies "make authors and they make facts" (183). Mary Putnam Jacobi made facts and made herself as an author by using the technologies available to her, particularly by traversing boundaries between text and image. Jacobi was deeply interested in literature, and although she does not seem to have had any talent at visual art, she had a strong interest in visual representation. While Jacobi hated having her own picture taken—we have only three photographs of her—she was intrigued by the emerging technologies of visual display.

She wrote a great deal throughout her medical life—her bibliography includes nearly 140 items—and her medical writing was always marked by vivid and precise description. She was never one to leave the



Figure 1. Mary Putnam Jacobi, circa 1863. The Schlesinger Library, Radcliffe Institute, Harvard University.

resources of a genre in the relatively undeveloped state in which she found them, and so her writing was also marked by formal experimentation, by a search for new ways of presenting complex information. Very often, those experiments focused on ways of presenting visual information, of mediating between word and image. It would be wrong to celebrate Jacobi as particularly adept or artistic in her use of images: the illustrations in her books and essays are in themselves unremarkable. But her practices of representation, in both writing and in oral performance, tell us a great deal about how medical writing developed as a specific professional and disciplinary form in the late nineteenth century, and they complicate our understanding of how that form was gendered

and how it was developed by particular writers. In that development, the writer's singular desire intersected with new medical practices of visual representation.

Steven Peitzman calls Mary Putnam Jacobi "probably the most brilliant of America's nineteenth-century women physicians" (27). After finishing high school, Jacobi cast about for her life's work—in the mid-nineteenth century, women did not exactly look for careers. She did some private teaching and tutoring; during the Civil War, she traveled to Union-occupied New Orleans to nurse her sick brother, and she preached to the "contraband" escaped slaves. Throughout her late teens and early twenties, she struggled with the evangelical beliefs her beloved grandmother had encouraged, finally declaring herself a "disbeliever" but resolving to abstain from the theater and the opera for ten years to prove that her disbelief was not motivated by a desire for amusement (*Life and Letters* 58). She studied chemistry and attended lectures at the New York Pharmacy School, eventually prevailing upon her father to allow her to attend the Woman's Medical College of Pennsylvania, reminding him of the "large liberty" that had always marked their family life (110).

The new Woman's Medical College and young Mary Putnam were not well matched; the school's atmosphere of Quaker piety and its openness to irregular medical practices tried her patience. Unlike more compliant early students, she applied to take her examinations after hearing the course of lectures for only one year: the faculty met several times on her case and wrote to New York for confirmation that she had attended lectures there. Mary Putnam, never very punctilious with institutional regulations, produced a scattered collection of lecture tickets, made some rude comments about the quality of lectures at the Pharmacy School, and turned in the second Latin medical thesis the Woman's Medical College faculty had seen. The faculty passed the thesis around—there is no evidence of it having been read through by anyone—and admitted Mary Putnam to examinations, which she passed. A few days later, Dean Edwin Fussell wrote a letter to the faculty protesting this action. He summed up his reasons: "And, lastly, firstly and all the time—because in my opinion we are not therein true to our own professions—we violate our long published standard of rules—degrade the College, injure the cause in which we labor—give reason to our enemies to rejoice at our dereliction, and to our friends to mourn over our weakness" (Woman's Medical College minutes, March 10, 1864).

In later life, although Jacobi participated in the Woman's Medical College Alumnae Association, she was sometimes critical in her accounts of the school, describing its early students, for example, as "really, and in the ordinary sense, illiterate," a charge that was simply not true ("Woman" 162). When she finally was permitted to register as a medical student in Paris after graduation from the Woman's Medical College, she was completely taken with her education, attending lectures and clinics at various hospitals, training herself in therapeutics and in the techniques of anatomical preparation. She also negotiated a visually rich environment: Paris was rich in wax models, celebrated for adept anatomical preparations, and also the center of publication for massive, detailed, anatomical atlases (Roberts and Tomlinson 538). Putnam became politically active through her friendship with the Réclus family of anarchists—after she overcame her shock at seeing Mme. Réclus clearing the table herself. Her friendship with the Réclus family brought her into the political life of the Paris Commune; she handily survived the siege of Paris on jam, wine, chocolate, and coffee, reassuring her mother that as long as these were provided, "one can not be very miserable" (*Life and Letters* 276). The Commune interrupted Mary Putnam's medical studies, but the bloody repression that followed—and perhaps the end of her engagement to a communard soldier—led her to finish her degree quickly and return to New York, where she taught at the Blackwells' school, the Woman's Medical College of the New York Infirmary.

The seventies and eighties were an enormously productive time for Mary Putnam. She published widely, entered a broad range of professional societies, and successfully joined the world of New York's academic and clinical elite medical institutions. Mary Putnam married Abraham Jacobi, a German socialist physician, one of the defendants in the Cologne Communist trial, who was practicing medicine in the German neighborhoods of the Lower East Side and also making his own way into the scientifically active professional associations of New York physicians. The two physicians shared commitments to the emancipation of women, scientific research, and radical politics. In New York as in Paris, Jacobi's professional life and her personal relationships were densely interconnected.

Recognition came quickly to Jacobi. She won the Boylston Prize for medical writing in an anonymous competition, became an honored

member of the faculty of the New York Medical College, was inducted into a bristling handful of honorary professional societies, and published in the most prestigious journals. Her research broadened in scope: she followed her book *On the Use of the Cold Pack Followed by Massage in the Treatment of Anaemia*, an obvious, if tacit, critique of S. Weir Mitchell's work, which had been published in 1877, with a compelling collection, *Essays on Hysteria, Brain Tumor, and Some Other Causes of Nervous Disease* in 1888. She treated C. P. Gilman, the author of "The Yellow Wallpaper," with a regimen of structured intellectual work, regular doses of phosphates in wine, and periodic galvanic treatment; she encouraged Gilman's participation in a women's basketball team. All in all, Mary Putnam Jacobi's medical career was exemplary. Hers is an individual story worth telling, if only to direct our attention to the singularity of her engagement with science and medicine.

But, of course, this story did not take place in a vacuum. By the 1880s, a sturdy corps of women doctors had been educated in the United States, mostly in women's medical schools. Where these women were not integrated into the male profession, they organized themselves to share medical information, often through their alumnae associations. Women physicians were also integrated with a vast network of reform-minded lay women interested in questions of health and medicine—only a score of women practiced as regular physicians in mid-nineteenth-century Boston, for example, but over 250 women attended meetings of the Boston Ladies' Physiological Society, where they might look through the society's treasured collection of skeletons and anatomical preparations or consult its library. Lectures on health, including the display of anatomical images, were very popular, and popular anatomical texts were broadly distributed (Sappol). And many nineteenth-century women testify in letters and diaries that, at least in reform circles, curiosity about the interior of the body was common, accepted, understood as an edifying pleasure (Wells, *Out of the Dead House* 193–226).

Jacobi took her own writing seriously, and it was seriously read. She insisted on the highest scientific standards, and she pioneered a number of significant research strategies, including the use of survey information in medical writing. Her use of images, whether evoked by verbal description or graphically displayed, was not the least of her concerns as a writer. Throughout her medical life, Jacobi found ways of giving free rein to her desire to see; as time went by, she made fewer concessions to

the convention that ruled a searching medical gaze inappropriate to women. As Jacobi's medical career developed, the medical technologies of the visible also advanced, and she took full advantage of them.

Taken together, Mary Putnam Jacobi's practices in deploying visual representations are an anthology of the ways in which late-nineteenth-century medical culture came to terms with the image. Looking at these practices quite specifically, we can begin to recognize the inadequacy of the two current lines of research in gender and visual scientific representation. One research program has understood the development of visual apparatus as a critical strategy in the construction of a modern gendered subject; to learn to see the objectified world through the developing armamentarium of scientific apparatus was to learn a practice of vision that entrained an immobile subject to an alienating apparatus. In this view, the early modern understanding of vision as a male penetration of female nature is mediated by new, industrialized, means of objectification (Jordanova; Crary). The other line of research on the scientific image, associated with Barbara Stafford, understands the image as a source of instruction and delight; in this view, the loss of visual literacy, the decline of visual education, and the valuation of text over image have been tragic losses.

Looking closely at the particularity of Jacobi's visual practices suggests that neither of these two lines of investigation does justice to the complexity with which medical images were displayed, understood, and appreciated in the nineteenth century, or to the very nuanced ways in which such images were gendered. Mary Putnam Jacobi associated medical images with transgression and with pleasure; her experiments with images met with resistance. But these pleasures, unlike those associated with other feminine practices of visual representation, like botanical drawing, were not oriented to producing an image that represented things that the eye could see: she was interested in abstractions, in relations, and above all in change. Her experiments do not map, in any easy way, onto the known gender markings of the territory of visual representation: she herself would have taken any suggestion that she saw "as a woman" as an incitement to satire. Nor was Jacobi alone among her sex; women whose visual practices diverged from a received feminine norm are continually lost and discovered. Consider, for example, the anatomical wax artist, Anna Morandi Manzolini, who shared Jacobi's interest in the movement (Messbarger), but who worked in a relentlessly realistic medium.

Let us consider an early *Medical Record* letter from Paris in which Mary Putnam gives an uncharacteristically enthusiastic account of a device “too good, or at least too striking, to pass over in silence,” the somatoscope—essentially, a lightbulb that a physician would insert into a body cavity (48). The young Mary Putnam was fascinated by the somatoscope’s ability to turn the walls of the body from curtains into screens, displaying what was inside. It is difficult to imagine a more convincing reversal of the usual logic of anatomy, which has been understood since Galen to turn on the process of dissection, an opening of the body “in order to see deeper or hidden parts” (2.3). The very skin that hides the interior organs becomes a means for visualizing them. Although the history of the somatoscope was brief and inglorious, this tool offered the young Dr. Putnam a model for medical representation: the object of representation would remain intact; the image would be directly produced by the object, but in an abstracted form (here, the shadow of the organ); the display would offer both instruction and pleasure.

When Jacobi began to teach at the Medical College of the New York Women’s Infirmary, she experimented with visual display as a mode of medical education. In her lectures on *Materia Medici*, she would ask students to directly observe the effect of a drug on a patient and reason out its mode of operation. The demonstrating patient became, as it were, a picture of the drug; Jacobi, as lecturer, would tease out the medical information implicit in this picture from her class. One of these lectures, “On Atropine,” was reprinted in the *Medical Record* and is included in Jacobi’s collected works. Jacobi announced that she would not follow the conventional program of the *Materia* lectures, which “compelled” students to “listen to accounts of the remedial action of drugs, that their ignorance of pathology rendered completely unintelligible to them” (204). In her lectures, students would learn the “properties of drugs in their natural and commercial condition,” beginning with that day’s lecture on atropine:

In the three cases where we tested the action of the atropine before your eyes, we observed a fall of the pulse within ten minutes. In the first case the patient was a delicate, lymphatic, but not nervous woman, to whom one-fiftieth gr[ain] of sulph. Atropine was given by the mouth, the pulse then being at 96, probably from some emotional excitement. In ten minutes the pulse had fallen to 80, and remained at 80 to the end of an hour, notwithstanding the occurrence of other symptoms of atropism, a slight flushing of the face, dryness of mouth and throat, and very slight dilations of the pupils. (205)

Jacobi went on to describe the effects of atropine on the other two patients, to draw conclusions from these demonstrations, and to extend them to a very comprehensive discussion of the whole clinical and chemical literature on atropine. All this is well and good to read as a finished text; it is painful to imagine this information, or the subsequent analysis, being elicited from a group of reluctant students. If, as the astronomer William Herschel claimed, “seeing is in some respect an art which must be learned” (qtd. in Schaffer 190), these students did not especially want to learn to see what Jacobi was showing them. They rebelled, demanding more accessible instruction. This lecture is a rare example of Jacobi attempting a direct display of the physical processes she wanted to explain: the effects of atropine and the changes in the patient that students were directed to observe were one and the same thing. There was no abstraction, no distribution of information, no redundancy: there was simply brutal, dense, information. However much Jacobi herself might have enjoyed such a display, she did not often attempt it again.

Sometimes, she textualized the image. While it is generally acknowledged in science studies that words and images are not translations of each other, Jacobi, at certain stages in her career, strove to make them equivalents by deploying the richly developed medical vocabulary for physical description. In an address originally given to the New York State Medical Society in 1874, “Remarks upon the Action of Nitrate of Silver on Epithelial and Gland Cells,” Jacobi began by reviewing the literature on experimental use of silver nitrate and then outlined a series of experiments that she had performed herself. Jacobi was able to bring with her a number of tissue samples from the stomachs of dogs and rabbits that she had treated with silver nitrate. She describes these preparations as seen under a microscope—*itself a fairly advanced piece of medical apparatus*—noting especially any differences between her observations and those recorded in the literature, and her descriptions are vivid, precise, and comprehensive. For example:

In the dog I have remarked one detail, not mentioned by Heidenhein or Rollet. The epithelial border seemed to consist of two layers of cells, of which the external was deeply spiculated. The lower part of the cell, deeply colored, was thus surrounded by a broad, clear, border. This appearance suggested an analogy with the spicules described by Frey on the pavement epithelium of the mouth and pharynx, and that as in this locality the epithelium is held

more firmly in place, the clear space below the epithelium is much less distinct in the dog; the gland tubes larger, and the polygonal cells larger and more distinct. (251)

Besides bringing the experience of viewing the epithelial cells that she had prepared directly and vividly before her audience, Jacobi is here using verbal description to do specific intellectual work, work that we would today do with various enhancements of the visual image: Jacobi's verbal image demonstrated the relations between parts, including the attachment of the epithelium and the clear space below it (see also Baym 192–93). And Jacobi also inserts her verbal image into a conversation with other researchers: this sample shows something that Heidenhein had not seen, and it reminds her of something that Frey had seen in a different context. It is entirely possible, of course, to stage a visual conversation: contemporary advertisements are in many ways arguments among images, and the history of anatomical art includes many instances of illustrations that are specifically designed to argue with received opinion. However, citation of a previous researcher by name is quite difficult in visual conversations, and in this talk, a demonstration of Jacobi's membership in the New York Medical Society, direct citation by name would have been an important marker for intellectual affiliation.

Mary Putnam Jacobi's apprenticeship as a writer, her way of teaching herself to describe objects in their relations, argue about them, and compare them to each other, had been organized in unlikely locations, including fashion reporting. Her letters on French fashions, possibly written for the *New York Herald Tribune* or the *New Orleans Times* in the late 1860s, were precise in their designations of color, position, size, texture, material, and attachment, the traditional rhetorical topics for descriptions of objects. Consider this description of bonbon boxes:

But the highest art of the master is not expended on the sugar plums. The boxes that hold them furnish a field for infinite ingenuity. The paper bag has been replaced by a box of enameled pasteboard, white, blue, rose or magenta colored, tied with a ribbon of the same shade. The Lancret basket is composed of a handkerchief of point d'Alencon, the four corners of which are raised by four bouquets of flowers, and are held by two handles covered with satin. The Trianon basket is coquettishly pretty, made of rice straw, garlanded with branches of roses, or of straw of gold, lined with white satin ornamented with grapes made of pearls. ("Our Paris Correspondent")

If Ludwig Fleck was right in arguing that facts are constructed in the spaces between the practices of the laboratory and the assumptions and beliefs of popular culture (111–24), the young Mary Putnam offers us a remarkable instance of a physician negotiating those spaces, moving from bonbon boxes to epithelial cells.

Further, for the young Mary Putnam, images of the body were politically significant and consequential—emblems, as it were, for the nineteenth century. In a short descriptive essay she wrote for *Scribner's Monthly*, “The Clubs of Paris,” she joins fascination and unease in her description of the raucous and democratic political clubs of the Commune:

Such an impression is made by a human fetus scarcely formed,—with its immense head,—its exaggerated nervous system,—its shapeless, powerless limbs,—its huge uncouthness,—in which, like pearls hidden in a mantle of rough skin, lie concealed unlimited possibilities of power, and beauty, and grace. (107)

It was very unusual for a writer in an American magazine to treat the Commune so sympathetically; for months, subscribers had been reading laments for the vanished gaiety of the Parisian boulevards. The embryo, an organism full of possibilities, however ungainly and disproportioned, would have offered such readers a new way of thinking about social movements and social change. What is of interest is not the “huge head,” but the process that the embryo suggests, the changes it promises. Jacobi is fascinated here, not by structure or position, but by relationship, process, possibility. These complex ideas are concentrated in an analogy, a form which Barbara Stafford identifies as an “uncanny visual capacity to bring divided things into unison or span the gap between the contingent and the absolute” (*Analogy* 28). Putnam was able to link disparate registers, to resolve divisions, and to activate the visual capacities of her readers in an extended verbal analogy.

Jacobi also found nonverbal strategies for bringing processes and changes before her readers, for making them speak: her favorite strategy was that of abstraction, especially as mediated by the sphygmograph. The sphygmograph made pressure tracings on a spinning roll of paper, allowing physicians to trace changes in pressure as a result of treatment or experimental interventions. Like other graphic tracings, the sphygmograph mediates between the optical culture of early-nineteenth-century science

and the digital culture we are now learning to navigate (Drorr 361). Jacobi included a number of sphygmographic tracings in her first book, *The Question of Rest for Women during Menstruation* (1876). In her second book, *On the Use of the Cold Pack Followed by Massage in the Treatment of Anaemia* (1880), the long strips showing the effects of cold packs on anemic patients' blood pressures were tipped into the book, so that they could be folded out and compared with one another. Jacobi found, in this relatively simple modification of the conventional form of the book, a way to bring one picture into conversation with another. Any medical reader, even one uninformed about technical innovations, could see the differences in tracings laid out in a row. Moreover, since the sphygmographic tracing presented an image of change over time and could be read and interpreted as a representation of a process, it was very closely adapted to Jacobi's scientific preoccupations. Like the early but ultimately unsatisfactory somatoscope, the sphygmograph did not lay open the structure of the body: brain, heart, and veins stayed where they were, intact. Sometimes, the sphygmograph was applied to wounds, as in a series of experiments performed on "Josie Nolan, aged ten, a very healthy Irish boy" with a convenient head fracture that exposed the membrane covering his brain. (Jacobi reassures her readers that Nolan has "so far, never experienced the least inconvenience from this partial exposure of the brain" ["Sphygmographic" 300].) Like the shadow of the somatoscope, the sphygmographic tracing was produced directly by the organ under investigation. Like the somatoscope, the sphygmograph was a technique that spoke to Jacobi's own preoccupations, to her desire to visualize what was hidden without destroying it.

Although the sphygmograph and similar instruments were sometimes valued for their ability to circumvent language, to get directly at physical processes, Jacobi often offered a very full discursive translation of her sphygmographic tracing. She would describe each tracing, interpret the description as evidence about what was going on in the system being studied, and draw some conclusion from the analysis. It is important to realize that Jacobi had to work out the linguistic means for writing these descriptions; there were no received forms for translating sphygmographic tracings (Drorr 374). Sometimes, Jacobi compares one tracing to another, giving verbal expression to the conversation between images. Always, she uses the single line of the sphygmograph tracing to support a verbal picture of the effects of the drug, as in this description



Figure 2. Sphygmographic tracings

of the effects of atropine on exposed brain tissue: “relaxation of cerebral blood-vessels; consequent diminished intra-cranial resistance to percussion stroke; more rapid collapse of arterial walls; diminution in mass of blood retained in brain” (“Sphygmographic” 307). The sphygmographic tracing works as a displaced and mediated picture, as a spatialized representation of the passage of time; Jacobi makes it speak to her reader about the invisible interior of the brain, heart, and veins. There was no optical reference, no model, for the processes that the sphygmograph traced; the pictures that it suggested were evoked by comparing one tracing with another (Rheinberger).

It took longer for Mary Putnam Jacobi to learn to use more direct, unmediated images, images that did correspond to optical experience—simple pictures of physical structures. Her “Studies in Endometritis,” a relatively late work, is among her first illustrated articles. The work was published serially in the *American Journal of Obstetrics* through 1885 and 1886. (Illustrations appear in the “Studies in Endometritis” on 126, 262–63, 266–67, 269, 811–16, and 923. Other significant illustrations occur in “Case of Absent Uterus” and “Remarks upon Empyema.”) Medical journals, of course, had long included small inset graphics: from midcentury, woodcuts and other engravings appeared in monthly journals such as the *Archives of Medicine*, although never in the weekly medical bulletins. But by 1879, images had appeared even in the weekly *Medical Record* and “illustrations” or “cuts” were common in the *American Journal of Obstetrics* throughout the 1880s. These pictures might show a surgical procedure, a design for bandages or other apparatus, a pathological specimen, or cellular structures. The “Studies in Endometritis” are profusely illustrated, including a score of woodcut engravings from microscopic slides. Some illustrations were copied from other texts, but others were apparently produced for this essay.

The figures extend Jacobi’s prose argument: they are often arranged in series to facilitate comparison (“Studies” 814), and are labeled obsessively: the illustration’s title identifies a sample of cells, the caption repeats that information, and the text will repeat it yet again. The redundant text, caption, and label imply that readers could not be

expected to see what Jacobi wanted them to see: she had, perhaps, learned the lesson of her early *Materia* lectures all too well, compromising her usual brisk exposition. In contemporary scientific illustrations, captions are normally interpretive rather than descriptive: “They orient viewers to similarities, contrasts, and other relevancies; . . . they supply metaphors, extrinsic connections, and genealogies which instruct viewers’ understanding of what they are being shown” (Lynch and Edgerton 202). In contrast, Mary Putnam Jacobi’s use of what was for her a new technology of the visible was less assured than her use of text or demonstration; the textual deictic is multiplied and repeated. In fact, these images are among the least interesting representations of the body that Jacobi used: wooden and flat, they are redundantly and insistently interpreted by the accompanying text. The hallmarks of Jacobi’s visual practices—abstraction, representation of change, relation to other images—are missing. The picture presents a version of the stained and foregrounded microscopic image; it shows what, under certain circumstances, we might see ourselves.

Jacobi found much more interesting images that represented broad forces and abstract relations. One instance of her use of such images is recorded in her remarkable essay, “The Practical Study of Biology,” originally an address to the Massachusetts Medical Society’s annual dinner in 1889. After arguing that a medical student must be changed in “his whole mind” so as to “insensibly . . . blend with the phenomena they can profoundly contemplate” (461), Jacobi offers a personal anecdote. So unusual is this gesture for Jacobi that her introduction to the story is uncharacteristically diffident and awkward: “I should like, Mr. Chairman, to mention an incident that occurred to myself in the course of a very simple laboratory experiment” (462), as she was examining the circulation in a frog’s lungs.

I happened to so focus my lens that all the outlines of the capillaries and blood corpuscles disappeared, leaving visible only the spaces between the epithelial cells. Nevertheless there remained a vision of the streaming movement of the invisible blood through the ramified spaces. The streaming was so rapid, so energetic, so ceaseless, it seemed as if it were pure motion or force divorced from the accidents of matter. The microscopic shred of tissue from the insignificant animal seemed for the moment to give a glimpse of a mighty vision of endless life, streaming with infinite energy into the minutest particles of an infinite universe. (462)

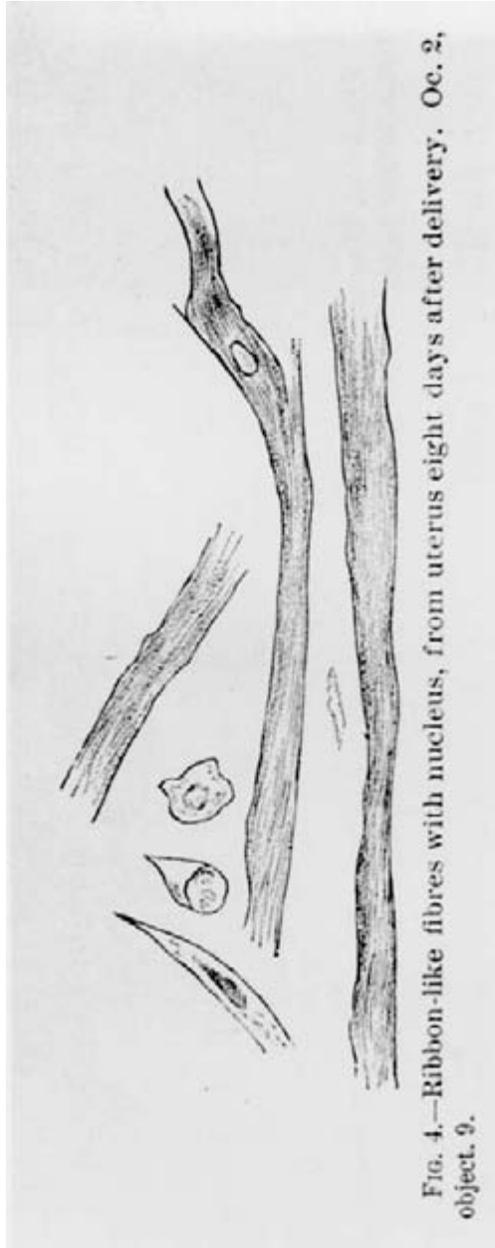


FIG. 4.—Ribbon-like fibres with nucleus, from uterus eight days after delivery. Oc. 2, object. 9.

Figure 3. "Ribbon-like fibres with nucleus, from uterus eight days after delivery"

Jacobi found this perception “indescribably powerful.” No wonder. The ghostly image of the hidden, moving, and clearly indicated blood represented for her the intellectual energies that had animated her work: an overarching theory (“mighty vision of endless life”) joined to detailed, concrete, and precisely located physiological structures (“spaces between the epithelial cells”), which were, after all, not material objects, but gaps between them. Such an image could speak of nothing but force, motion, will. She repeatedly reproduced this figure for her students: “Since then I have confronted students with this same impression,” offering it deictically as “the horizons towards which they were henceforth to keep their eyes directed” (462).

For Jacobi, neither the surface nor the interior was the domain of truth. Truth was mobile; truth inhabited the space between the spectacular image and the awed spectator. The medical truth that Jacobi sought in these verbal images and speaking pictures was a truth about the tempo and structure of complex bodily processes, particularly as they were actively constructed by human beings in displays and experiments. While her experiments in visual representation were modest, the logic behind them was individual, startling, and premonitory. These experiments open to knowledge a body that has been transformed, whether by treatment or disease. It is that transformation which is the object of Jacobi’s desire—it was perhaps the deadness of the rat, rather than the visible structure of its heart, that so excited her interest. And she was compelled by dynamic transformations, both in their relation to the normal state of the organism and in their relations to other images, other descriptions. Jacobi’s images join a babble of scientific voices and pictures that debate the effects of nitrate of silver, the relation between arterial pressure in the brain and blood volume, and the interactions of atropine and belladonna. Whatever specific physical process these images, verbal or visual, represent, their ultimate reference for Jacobi was to that “endless life” that so fascinated her, a force that was neither a visible object nor an idealization.

