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Johannes Müller. *Johannes Müller und die Pathologische Anatomie: eine kommentierte Edition der Vorlesungsmitschrift von Jakob Henle (1830).* Edited with introduction by Ildikó Gágyor. Beiträge zur Geschichte, Theorie und Ethik der Medizin. Hildesheim: Olms, 2008. 224 pp. EUR 58.00 (cloth), ISBN 978-3-487-13595-3.

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A Student's Scrupulous Notes on Pathological Anatomy

Johannes Müller (1801-58) is known as one of the pioneers of physiology in Germany; in his field, he countered the influence of Romantic *Naturphilosophie* with empirical scientific analysis. He is known, among other things, for propagating the use of the microscope and for his excellence in teaching, as his students went on to become some of the foremost physiologists of the nineteenth century, including Theodor Schwann (1810-82), who extrapolated the cell theory from plant tissues to animal tissues; the anatomical pathologist Rudolf Virchow (1821-1902), known for his theory of cellular pathology; and the anatomist Jakob Henle (1809-85).[1] One of the topics that Müller lectured on frequently was pathological anatomy, a field that used dissection to find indications of what caused diseases. In 1830, pathological anatomy was an elective subject for medical students, taught by physicians who were specialists in other fields. The field represented a link in the chain of development in the theoretical understanding of disease stretching from the humoral-pathological concepts of the eighteenth century, through the conceptions of organs or tissues as the sites of pathology in the work of Giovanni Battista Morgagni (1682-1771) and Marie François Xavier Bichat (1771-1802), respectively, to the concept of cellular pathology espoused by Virchow.[2] Around 1830, it was very exciting to be involved in pathological anatomy; as Ildikó Gágyor puts it, it was "eine ... Disziplin, die sich doch gerade in der Mitte des 19. Jahrhunderts am Anfang ihrer Entwicklung befand und noch viele Entdeckungen bzw. neu zu erforschende Bereiche barg" (p. 59). In the winter semester of 1829-30, Jakob Henle was one of eleven students who took part in Müller's lecture course on pathological anatomy, and Henle's meticulous notes, augmented by those of four others, presumably fellow students filling in the gaps for him when he was absent, were deposited in the University Library in Göttingen by Henle's daughter in 1921. Ildikó Gágyor has now edited these notes and thus provided the twenty-first-century reader easy access to Müller's lecture.

Gágyor's edition is a work of scrupulous scholarship. She has transcribed sixty-two pages of handwritten text, annotated the text with footnotes commenting on relevant contemporary medical literature and personalities mentioned directly or made use of in Müller's lecture, and added an appendix with brief biographies of the medical personalities relevant to the lecture. In addition, she has written a substantial introduction to the text, providing the reader with thoroughly researched information on the notes and the historical context that gave rise to them. The introduction covers the development of pathological anatomy as a field; Müller's biography and his students' evaluations of him as an instructor; Henle's biography and his relationship to Müller; a detailed description of the notes, their provenance and authenticity, and the editorial principles followed in the transcription process; the relationship between this lecture and the field of pathological anatomy; a discussion of the practice of "compilation," or the selection and use of source material in lecturing; a discussion of Müller's role in the development of the field of pathological anatomy; and finally, a brief summary of the insights provided by the critical introduction and a statement of the goals of Gágyor's book.

The lecture itself is divided into five sections. The first, "Pathologische Anatomie der Mißbildungen," provides a taxonomy of congenital malforma-

tions. In this section, Müller discusses "Doppelbildungen" (p. 76), or cases in which two fetuses have grown together; "Verschmelzungsbildungen" (p. 79), or cases in which the symmetry of certain body parts such as the eyes, the ears, the arms, or the feet is suppressed, resulting in cyclopism, "Monotia" and so on (p. 81); "Defekte" (p. 81), or cases in which parts of the fetus's body are missing; and "Spaltbildungen und Atresien" (p. 83), including, for example, spina bifida and cleft palate. "Hermafroditism[us]" (p. 88) is also discussed, and a final section, "Regelwidrige Bildung und Varietät" (p. 90), discusses structural problems in the cardiovascular system as well as displaced internal organs. The second, "Pathol[ogische] Anatomie der allgem[einen] Organe{:} Veränderungen der Gewebe" (p. 92), is concerned with the pathological effects of inflammation, hypertrophy, atrophy, "Verhärtung und Erweichung" (p. 100), the transformation of one form of tissue into another, and tuberculosis.[3] In this section, Müller also discusses a variety of "krebshaften Krankheiten" (p. 120) such as melanosis, telangiectasia, scirrhous tumors, carcinoma, and hemangioma as well as "Markschwamm" (p. 116) and "Schwamm der Knochen" (p. 119). The third section, "Patholog[ische] Anatomie der einzelnen Organe" (p. 121), is the longest; it discusses a wide variety of ailments of various organs. This section goes into the greatest detail when dealing with the bones, the blood vessels and lymphatics, and the uterus. The fourth section, "Von den Dislokati[onen]" (p.153), describes various ruptures–of the lower abdomen, the groin area, the navel, the abdominal muscles, the vagina, the back, and the diaphragm–in addition to dislocated lungs, herniation of the brain, and uterine prolapse. Gágyor points out that this section of the lecture is heavily based on *Handbuch der Pathologischen Anatomie* (1812-18) by Johann Friedrich Meckel (1781-1833), with portions taken verbatim from that text. The fifth, "Von den Konkretionen und Steinen" (p. 166), deals with calculi or stones in the urinary tract, the gall bladder, the blood vessels, the salivary glands, the intestines, or in the joints as a result of gout. Gágyor notes that this section, too, is heavily based on Meckel. A proposed sixth section, "Von den Würmern" (p. 34), was left out, possibly because Henle had already received adequate information on parasitic worms in another course.

The lecture notes contain a wealth of detailed information, not only on early nineteenth-century conceptions of pathology, but also on issues and controversies that sparked academic debate during the period. Two pertinent examples are hermaphroditism and the role of the mother's gaze in fetal development. Müller, lecturing in 1829 or 1830, interprets human hermaphroditism in such a way that makes it exceedingly difficult to find it in nature. Müller describes three classes of hermaphroditism. To the first class, he relegates men with hypospadias, which can result in their genitalia resembling female genitalia, but Müller maintains that this is simply "eine Hemmungsbildung vollkommen männlicher Geschlechtstheile" (p. 86). He goes on to describe women with "mehrere Kennzeichen von männlicher Bildung" whose genitalia resemble male genitalia; he calls these women "viragines" and finds that they, like men with hypospadias, owe the appearance of their reproductive organs to a developmental anomaly: "{S}o ist dies noch gar kein Schritt zur Männlichkeit, sondern wieder blose Hemmungsbildung" (p. 88). The second class is made up of individuals with fully developed genitalia and either traces of or a fully developed second set of genitalia of the opposite sex. Müller finds such developments highly unlikely and ascribes them, in part, to physicians misinterpreting what they see. The third class of hermaphrodites is made up of individuals with male genitalia on one side and female genitalia on the other. These individuals, Müller maintains, are extremely rare, but examples have been reported. Normally, however, Müller believes that such individuals are not genuine hermaphrodites, but are really examples of a congenital duplicate developmental anomaly: "Wenn sich daher bei einem sogenannten hermafrod[itischen] Individuum abermals auch äußerliche Zeichen der Duplizität in dem Ueberfluß gewisser Theile zeigen, so entsteht der Verdacht einer unvollkommenen Doppelmißgeburt und dieser Verdacht macht abermals die Existenz des Hermafrod[itismus] um vieles zweifelhafter" (pp. 89-90). Müller thus stands near the beginning of an empirical scientific tradition that attempted to elide the transitional position that the hermaphrodite inhabits between maleness and femaleness. In 1876, Theodor Albrecht Klebs would recommend that hermaphrodites be defined as individuals with both male and female gonadal tissues, thereby greatly limiting the number of individuals who could be considered hermaphrodites. As Anne Fausto-Sterling put it, "People of mixed sex all but disappeared, not because they had become rarer, but because scientific methods classified them out of existence."[4] One can

already see the beginnings of this tendency in Müller's classification of hermaphrodites.

Müller's discussion of the role of the mother's misdirected gaze, or "Versehen" (p. 74), in fetal development provides the twenty-first-century reader with further insight into the state of academic debate on pathological anatomy in the early nineteenth century. Müller begins his section on congenital malformations by refuting the superstitious belief that the misdirected gaze of the mother can lead to modifications in the fetus during its development, and he maintains that this erroneous superstition holds currency not only among people in general but also within the medical profession. He faults the influence of animal magnetism or Mesmerism for the widespread appeal of this conception of how congenital malformations are caused. The belief in the workings "des Geistes in Distans" (p. 74) superceded the laws of nature, according to Müller. Müller affirms that the mother's emotions can have an effect on fetal development, but he firmly denies the idea that "Affekte der Mutter, welche mit fantastischen Vorstellungen begleitet sind, der Bildung des Fötus die Richtung der fantastischen Vorstellungen mittheilen {können}" (p. 74). He refutes the folk belief in *Versehen* with rational, logical arguments, stating that malformed fetuses are subject to laws of development and can only take certain forms; that malformed fetuses are the result of congenital birth defects; that *Versehen* often takes place without any effects at all; that most of the fetus's body parts have been formed by the fourth to the eighth week of pregnancy and cannot be transformed after that, despite the claims of pregnant women to have harmed their fetuses by misdirecting their gazes even later; and finally, that mothers claiming to have caused congenital malformations by *Versehen* often later give birth to other children with the same birth defects. Müller's meticulous refutation of this superstition stands at the very beginning of the first section of the lecture, a lengthy description of the "Pathol[ogische] An[atomie] der Mißbildungen" (p. 74), and the pride of place his rational arguments enjoy bears witness to the significant role played by folk superstition in both the popular mindset and some sectors of the medical profession. Müller was lecturing when the scientific field of teratology was in its infancy. Its founders included Étienne Geoffroy Saint-Hilaire (1772-1844) and the very same Meckel whose work formed the basis of so much of Müller's lecture on pathological anatomy. This new field demonstrated, among other things, that congenital malformations, once considered marvelous or even monstrous (as the name "teratology" suggests), were, in fact, part of nature, for Saint-Hilaire asserted that "birth anomalies resulted from abnormal embryonic development."[5] Müller's discussion of *Versehen* places him squarely in the camp of empirical scientists seeking to counter the Romantic conceptions of *Naturphilosophie* in pathological anatomy.

As stated above, Gágyor's edition of Müller's lecture is a work of scrupulous scholarship and affords the reader a wealth of information on early nineteenth-century medicine and medical education and on the biographies of Müller and Henle. Additionally, the extensive bibliography and appendix of biographies of medical personalities are helpful references for scholars working on topics touching upon early nineteenth-century medicine. The work is, by its very nature, narrow in focus, though Gágyor succeeds in her introduction in drawing out the wider-reaching themes that bear upon the lecture. Given the specificity of the topic, this work will be of most use to scholars focusing on the history of medicine or medical education, on Müller or Henle, or on topics informed by the aspects of pathological anatomy discussed in the lecture.

Notes

[1]. See Wolfgang U. Eckart, *Geschichte der Medizin*, 5th rev. ed. (Heidelberg: Springer, 2005), 194-195; Roy Porter, "Medical Science," *The Cambridge History of Medicine*, ed. Roy Porter (Cambridge: Cambridge University Press, 2006), 136-175, esp. 158-160.

[2]. See Porter, "Medical Science," 150-152.

[3]. Gágyor uses square brackets to identify her own insertions into Müller's text. In order to differentiate my own insertions from hers, I have marked mine with curved brackets, i.e., {}.

[4]. Anne Fausto-Sterling, *Sexing the Body: Gender Politics and the Construction of Sexuality* (New York: Basic Books, 2000), 39.

[5]. Ibid., 36.

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