Medical History

Friedrich Wolter (1863-?1944): the last anticontagionist

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Friedrich Wolter of Hamburg was the most fervent, and the last, protagonist of the aberrant doctrine of Max von Pettenkofer on the mode of transmission of cholera, and later of typhoid. Pettenkofer's doctrine, and his autoexperiment intended to demonstrate its truth, were described in 1973.¹ It therefore suffices to say here that, despite his important other contributions to public health, Pettenkofer persistently repudiated, in numerous and voluminous publications that started in 1855,² the idea that man could be directly infected by the cholera vibrio by ingesting faecally contaminated food or drink.

Pettenkofer had many followers in the whole English-speaking world, as also in continental Europe, but by the end of the nineteenth century these had become a shrinking, although vocal, minority. Nevertheless, until his suicide in his 83rd year on 3 February 1901, Pettenkofer continued to pour scorn on "drinking-water theoreticians" who were blind to "epidemiological reasoning."

Hamburg cholera outbreaks

In 1893 the young (30) Wolter studied records of all cholera epidemics in Hamburg since 1831. This left no doubt in his mind that Pettenkofer's doctrine was correct, and that outbreaks of the disease could not occur in the absence of certain states of the soil (the *Bodentheorie*) and, especially, fluctuations in the level of the ground water (*Grundwasser*). Wolter sent a report of this study to Pettenkofer, who, overwhelmed at finding a new disciple, replied on 9 December 1893 that he felt that "a stone had fallen" from his heart at learning that among all the "bacteriological thinkers" there was still at Hamburg an "epidemiological thinker."³

In 1898 Wolter published a study of almost 400 pages on the Hamburg cholera epidemics.⁴ According to him, there had been outbreaks of varying magnitude in no less than 20 of the years 1831-73, after which the Hanseatic city remained free from the disease until the serious epidemic of 1892. Wolter dedicated his study to Pettenkofer, whom he describes as the "Nestor of epidemiological research on cholera."⁵ He expressed the hope that the study would contribute to the confirmation of the epidemiological concept of the origin of cholera, for which Pettenkofer had "prepared a place in science." Epidemiological studies of all the cholera outbreaks in Hamburg, he claimed, showed that they were determined by climatic conditions and by fluctuations in the levels of ground water. Drinking water per se was not responsible but, if contaminated, exerted a generally noxious effect and increased individual susceptibility to a disease favoured by place-time-individual relationships. It

was not until 42 years later that Wolter was to disclose that Pettenkofer himself had defrayed the publishing costs of the book,³ which was essentially conceived as a counterblast to a detailed and objective analysis of the 1892 Hamburg cholera epidemic published in 1896 by a group of "bacteriological thinkers" that included Robert Koch.⁶

Pettenkofer's localistic doctrine

After Pettenkofer's death he was succeeded in the chair of hygiene at Munich by Rudolf Emmerich. Emmerich was a no less fanatical anticontagionist than his predecessor, and in 1906 he and Wolter combined to launch a series of monographs (*Jubiläumschrift*) in commemoration of the 50th anniversary of Pettenkofer's "localistic doctrine."⁷ The first of these was a detailed epidemiological study, written partly by Emmerich and partly by Wolter, of a typhoid outbreak in Gelsenkirchen in 1901, dedicated "in love and honour" to Pettenkofer, who, according to Wolter's foreword, departed this life worn out by the scientific struggle for his "epidemiological or localistic doctrine" but in the firm conviction that the

"reigning contagionist or drinking water theory would in the not too distant future be refuted by bacteriology itself, and that by the mighty voice of epidemiological facts the correctness of his epidemiological conception would be proved."⁸

Further on, Wolter described the "typhoid question," as also the "cholera question," as belonging to "the most difficult and most disputed problems of scientific medicine." Pettenkofer's and Koch's conceptions, he said, stood in direct opposition to one another.

In 1910 Emmerich published the third of the *Jubiläumschrift* series—a massive monograph of 750 quarto pages on *Max von Pettenkofer's Soil-Doctrine of Cholera Indica*.⁹ In a long introduction he speaks of the "false excremental-contact and drinking-water theory" and asserts the correctness of Pettenkofer's doctrine as opposed to that of Koch. Pettenkofer, he says, had been a personal friend of Bismarck, but he had been no more listened to since the latter resigned in 1890. The object of followers of Koch in denouncing the localistic doctrine was "the intellectual castration and domination of the medical world." Emmerich states categorically: "Drinking water plays no role in the origin of cholera epidemics." There was nothing new in the "drinking-water belief," which, he says, was one of the grounds for the persecution of the Jews in the Middle Ages. He was, of course, referring to the martyrization of Jews suspected of causing plague by poisoning wells.

In the same year—which was that of Koch's death—Wolter had published the second of the *Jubiläumschrift* series.¹⁰ In this he spoke of the "glaring contradiction" between Pettenkofer's "localistic concept" and the concept of Koch, which, he complained, had pushed Pettenkofer's doctrine into the background. In more than 300 quarto pages Wolter comments on numerous epidemics of cholera or typhoid, denouncing John Snow's

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impeccable epidemiological reasoning and denying that the Broad Street pump had had any responsibility for the Soho cholera outbreak in 1854.

War diseases

In 1914 Emmerich died, and Wolter published the fifth in the *Jubiläumsschrift* series. This was concerned with the causes of "war diseases" (*Kriegsseuchen*), among which Wolter included cholera, dysentery, typhoid, and typhus, predictably explaining their aetiology on localist principles, and relying on a retrospective analysis of epidemiological data referring principally to the Franco-Prussian but also the Crimean Wars.¹¹ As was the case with Pettenkofer, Wolter was to be as long lived and as prolific a polemicist as he was obstinately in the wrong, and he was to continue to publish his incredibly anachronistic contentions for three more decades. Of 11 volumes in the *Jubiläumsschrift* series published from 1925 to 1930 (the last 10 of which had the series title *Pettenkofer-Denkschrift*), Wolter was the author of nine, Hans Gleitsmann, a naval surgeon, being responsible for the other two.

Soil diseases

But the end of this series—which constitutes a veritable museum piece of medical antinomianism—was not the end of Wolter's medicoliterary fertility. Throughout the 1930s and until 1944 he continued to publish articles in German general and specialist medical journals in which he laboriously repeated the same arguments, branding one disease after another as dependent on conditions of soil and climate. In 1941 he published in a German psychiatric journal an article of over a hundred pages to show that poliomyelitis was a "soil disease."¹²

As from 1926 Wolter described himself as director (Leiter) of the "Hamburg Research Institute for Epidemiology," but I have searched in vain for evidence that this consisted of anyone but Wolter himself.

In 1940 he published a book¹³ on (what he called) "comparative epidemiology," which he dedicated to the memory of his wife, "my true, understanding, fellow-fighter for Pettenkofer's doctrine for four decades." The subtitle refers to the "contemporary contradiction" between "miasma" and "contagion," and he rejects both the "insect theory" and the "rat theory." This and Wolter's subsequent writings are the products of a mentally deranged author. One can only marvel that they were ever accepted for publication. Not only cholera and typhoid, but also beri-beri, Bornholm's disease, brucellosis, cerebrospinal meningitis, diphtheria, epidemic encephalitis, "epidemic ophthalmia," goitre, influenza, malaria, poliomyelitis, psittacosis, Weil's disease, and yellow fever are explained by the *Bodentheorie*. In 1942 Wolter maintained that epidemic hepatitis was not infectious but due to "a gaseous, toxic cause of disease developing from an unhealthy soil."¹³ In the next year he published a book on "typhus as a war-disease" in which he attributed a similar aetiology also to plague and scurvy.¹⁴ Reviewing this book, F von Bormann warned its readers against it, saying sharply: "This book is harmful."¹⁵

In 1944, at the age of 81 and in his eighteenth year as director of the Hamburg Research Institute for Epidemiology, Wolter coined a similar aetiology for scarlatina, invoking inter alia sun-spots, climatic variations, and fluctuations in the level of ground water, and claiming that Pettenkofer had validated Sydenham's concept of an "epidemic constitution."¹⁶

Wolter's death

It might be thought that the decease of such a remarkable character as Wolter would have been considered worthy of notice if only to hold him up as an awful example. But a search of

German and German-Swiss medical periodicals for 1944 and the succeeding four years turned up no information on the ultimate fate of the last of Pettenkofer's disciples. An inquiry of the Staats- und Universitätsbibliothek, Hamburg, resulted in the information that according to the Hamburg Staatsarchiv Wolter was bombed out of his house in 1943 and moved into the Harburg district. Thereafter, all trace of him is lost.

The references to Wolter's writings given below are illustrative and far from constituting his complete bibliography. But as his entire literary output is a monotonous repetition of the same anachronistic theme applied to different diseases, a few typical examples have been thought to suffice.

Bibliography

- Howard-Jones N. Gelsenkirchen typhoid epidemic of 1901, Robert Koch, and the dead hand of Max von Pettenkofer. *Br Med J* 1973;i:103-5.
- Pettenkofer M von. *Untersuchungen und Beobachtungen über die Verbreitungsart der Cholera*. München: JG Cotta, 1855.
- Wolter F. *Vergleichende Epidemiologie im Zeitalter Max von Pettenkofer's, Louis Pasteur's und Robert Koch's in ihrer Auswirkung auf die Seuchen-Verhütung und -Bekämpfung*. Dresden und Leipzig: Theodor Steinkopf, 1940.
- Wolter F. *Das Auftreten der Cholera in Hamburg in dem Zeitraume 1831-1893 mit besondere Berücksichtigung der Epidemie des Jahres 1892*. München: JF Lehmann, 1898.
- This was a rather equivocal tribute for, as stated by the *Encyclopaedia Britannica* (1964) of Nestor, "Ovid parodied his antique garrulity."
- Gaffky G, ed. *Die Cholera in Hamburg im Herbst 1892 und Winter 1892-93. Arb kaiserl Gesundheitsamte 1896*;10, Heft 1:1-128.
- Jubiläumsschrift zum 50 jährigen Gedenken der Begründung der lokalistischen Lehre Max von Pettenkofer's*. Bd 1. München: JF Lehmann, 1906. Five further volumes were published under this series title in 1910 (2), 1911, 1914, and 1925. The title of the series was, as from 1926, changed to *Pettenkofer-Gedenkschrift*, under which the first 6 volumes were retrospectively listed, and the last of a total of 16 volumes appeared in 1930. The eighth volume was published as "Band VII, Heft 2," but was retrospectively denominated "Band VI, Heft 3." This series is as confusing bibliographically as is its content scientifically, and the Index-Catalogue contributes to the confusion by listing Band V as "v2" and omitting the series title in two cases.
- Emmerich R, Wolter F. *Die Entstehungsursachen der Gelsenkirchener Typhusepidemie von 1901*. München: JF Lehmann, 1906. In the German literature of the time, and for some years after, typhoid was termed "Typhus" or "Typhus abdominalis," and typhus proper was distinguished as "Flecktyphus" or "Fleckfieber." For an account of the Gelsenkirchen epidemic and the direct confrontation between Emmerich and Koch in judicial proceedings see reference 1.
- Emmerich R. *Max von Pettenkofer's Bodenlehre der Cholera indica*. München: JF Lehmann, 1910.
- Wolter F. *Die Hauptgrundgesetze der epidemiologischen Typhus- und Choleraforschung*. München: JF Lehmann, 1910.
- Wolter F. *Die Entstehungsursachen der Kriegsseuchen, ihre Verhütung und Bekämpfung auf Grund der Kriegserfahrungen von 1870-71*. München: JF Lehmann, 1914.
- Wolter F. Die epidemische Kinderlähmung (Heine-Medinsche Krankheit, Poliomyelitis epidemica) in dem Zeitraume von 1835-1939; mit besonderer Berücksichtigung ihres Auftretens im letzten Jahrzehnt; ihre Aetiology, Pathogenese und Prophylaxe, vom kontagionistischen und vom epidemiologischen Standpunkt. *Arch Psychiatr* 1941;113:126-232.
- Wolter F. Der "sogennanter katarrhalische Ikterus" (Eppinger) und Hepatitis epidemica mit besonderer Berücksichtigung ihres Verhältnisses zum Ikterus catarrhalis Virchows. *Dtsch Med Wochenschr* 1942;68:558-60.
- Wolter F. *Ueber das Fleckfieber als Kriegsseuche*. Berlin: KF Haug, 1943.
- Bormann F von. *Med Welt* 1944;17:468.
- Wolter F. Die Scharlachepidemie seit 1941. Ein epidemiologischer Beitrag zum Scharlachproblem. *Med Welt* 1944;18:345-8.

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What is the therapeutic range for the prothrombin time in a patient who is taking warfarin sodium?

The accepted therapeutic range for the prothrombin time in a patient who is taking warfarin sodium is usually taken as between two and three times the control time. Lesser prolongation of the prothrombin time is ineffective. Recently the prothrombin time has been somewhat superseded by the thrombotest, which uses capillary blood, and the therapeutic range for the thrombotest is between 5% and 12%.