Chapter 10

The first Global Map of the Distribution of Human Diseases: Friedrich Schnurrer’s ‘Charte über die geographische Ausbreitung der Krankheiten’ (1827)

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The practice of global cartographic representation of diseases dates from the first third of the nineteenth century, that is, from a time when, in the context of large-scale exploration of the physical world, naturalists such as Alexander von Humboldt (1769–1859) devised the conceptual means for such visual representation, namely, the technique of isotherms.¹ By means of these, a coherent, geographical distribution of physical parameters could be visualized. Leonhard Ludwig Finke’s (1747–1837) early, three-volume Versuch einer allgemeinen medicinisch-praktischen Geographie (Essay on General Medico-Practical Geography) was not accompanied by any cartographic representations (although he may have attempted such a map).² Yet disease maps were published before 1830, the year commonly associated with the emergence of a widespread interest in medical geography, when a cholera epidemic threatened Europe.³

In 1827, the Swabian physician Friedrich Schnurrer (1784–1833), Amtsarzt (public health officer) in Vaihingen on the Enz (near Stuttgart), presented what is believed to be the first global ‘Charte über die geographische Ausbreitung der Krankheiten’ (Map of the geographical Distribution of Diseases).⁴ The map is here interpreted as

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³As has been held, e.g., by H J Jusatz, ‘Zur Entwicklungsgeschichte der medizinisch-geographischen Karten in Deutschland’, Mitteilungen des Reichsamts für Landesaufnahme, Berlin, 1939, vol. 1, pp. 11–22.
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part of the contemporary emergence of Humboldtian representation and as a typical product of the transition from Romantic speculation to "natural historical" medicine.5

Life of Friedrich Schnurrer

Schnurrer was born in Tübingen in 1784. His father, Christian Friedrich Schnurrer (1742–1822) was an important theologian and orientalist who later became chancellor of Tübingen University. In 1800, at the age of nearly sixteen, Friedrich enrolled at Tübingen. Among his teachers in the Medical Faculty were Gottlieb Konrad Christian Storr (1749–1821), Wilhelm Gottfried Plouquet (1744–1814), Karl Friedrich Kielmeyer (1765–1844), and Johann Heinrich Ferdinand Autenrieth (1772–1835). In 1805, Schnurrer obtained his MD under Kielmeyer with a dissertation entitled Observata quadam de materierium quarundam oxadatarum in germinationem efficiencia pro diversa seminum rerumque externarum indole (Observations on the Effects of Certain Oxydated Substances on the Germination of Seeds),6 in which he developed observations made earlier by Alexander von Humboldt in his Flora Fribergensis specimen (1793).7 Schnurrer's dissertation was in part republished in the Journal für die Chemie und Physik (1806)8 and reviewed in the Medicinisch-chirurgische Zeitung (1807).9 Having obtained his MD, Schnurrer continued academic study for a number of years at Würzburg, Bamberg, Göttingen, and Berlin. In 1807, he visited Paris, and met Georges Cuvier (1769–1832).10 Later that year, back in Tübingen, Schnurrer passed his qualifying examination for the practice of medicine and again enrolled at Tübingen University.

During this further period of study at Tübingen, Schnurrer joined a circle of Romantic poets, the so-called "Schwäbische Dichter", led by the physician Justinus Kerner (1786–1862),11 the poet Ludwig Uhland (1787–1862),12 the philologist Gustav Schwab (1792–1850), and another physician, Karl Heinrich Köstlin (1787–1859). Another, temporary, member was the Berlin diplomat and later famous Humboldt correspondent Karl August Varnhagen von Ense (1785–1858).

In 1810, Schnurrer published his first monograph, Materialien zu einer allgemeinen Naturlehre der Epidemien und Contagien (Documents for a General Natural History

6 Fridericus Schnurrer, Observata quadam de materierium quarundam oxadatarum in germinationem efficiencia pro diversa seminum rerumque externarum indole, Tübingen, Litt. Hopffer, 1805.
7 Alexander von Humboldt, Flora Fribergensis specimen plantas cryptogamicas praestim subterraneas exhibens, Berlin, Rottmann, 1793.
8 F Schnurrer, 'Beobachtungen über den Einfluß einiger oxydierter Substanzen auf das Keimen der Samen, nach der verschiedenen Beschaffenheit der letzteren und unter verschiedenen äußern Umständen', Journal für die Chemie und Physik, 1806, 2: 56–76.
12 In the correspondence between Uhland and Kerner, Schnurrer is frequently mentioned: Theobald Kerner, Briefwechsel Justinus Kernels mit seinen Freunden, Leipzig and Stuttgart, Deutsche Verlagsanstalt, 1897, passim.
of Epidemics and Contagia)," which was translated into French (1815). In 1811, again in Tübingen, Schnurrer offered a course on 'Die Abänderungen der Krankheiten in verschiedenen Climaaten und über Krankheiten, die gewiß den Gegenenden eigentümlich sind, in Verbindung mit physischer Geographie und Naturgeschichte des Menschens' (The Changes of Diseases in Different Climates and on Diseases Which are Endemic in Certain Regions, Together With Physical Geography and Natural History of Man). This course appears not to have engendered enough interest to attract any paying students.14

Later that year, Schnurrer became Amtsarzt (public health officer) in Herrenberg, not far from Tübingen; this marked the end of the purely scientific phase of his career. The reasons for this change are not known. Uhland regretted Schnurrer's departure and regarded this as an impoverishment of the poets' circle. Schnurrer himself, in the preface to his 1831 Allgemeine Krankheits-Lehre, expressed regret that he had not followed a scientific career.15 Despite practical commitments, Schnurrer was able to continue his scientific work, and in 1813 he published his Geographische Nosologie oder die Lehre von den Veränderungen der Krankheiten in den verschiedenen Gegenden der Erde, in Verbindung mit physischer Geographie und Natur-Geschichte des Menschen (Geographical Nosology or Doctrine of the Changes of Diseases in Different Parts of the World, in the Context of Physical Geography and the Natural History of Man),16 which for the most part was a compilation of historical accounts of various diseases from published sources that Schnurrer had found in the libraries of Storr, von Plouquet, Kielmeyer, and Autenrieth—and in that of his father.

In 1814, Schnurrer was appointed Oberamtsarzt (district public health officer) in Vaihingen on the Enz, a few miles from Stuttgart, and in the following year he married. After 1817, Schnurrer contributed articles to Ersch and Gruber's Allgemeine Encyclopaedie der Wissenschaften und Künste on various medical topics, such as 'Air (the disease)', 'Albinos', 'Alopecie', and 'Contagion'.17 One of the most important entries is the one of 1828 on 'Cholera'.18 During this period, Schnurrer corresponded with various colleagues in order to collect material for his magnum opus, the two volume Chronik der Seuchen (Chronicle of Epidemics) which appeared 1823–1825.19 Subsequently, from 1825 through 1828, he contributed sixteen reviews on different

13 F. Schnurrer, Materialien zu einer allgemeinen Naturlehre der Epidemieen und Contagien, Tübingen, Heerbrandt, 1810.
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medical texts (including his own Chronik) to one of the leading review journals of that time, the Göttingische Gelehrte Anzeigen.

In 1830, Schnurrer was appointed personal physician to the Duke of Nassau in his residence of Biebrich near Wiesbaden. He published his last work in 1831, a compendium of pathology. Appointed Privy Councillor in 1832, Schnurrer died in 1833 at the age of forty-eight.

Nosology

In 1827, Schnurrer transformed his chronological narrative of diseases into a spatial representation, producing the above mentioned ‘Charte über die geographische Ausbreitung der Krankheiten’, which was presented and discussed at the sixth annual Versammlung der deutschen Aerzte und Naturforscher (Meeting of German Scientists and Physicians) in Munich20 and, the following year, published in the Cotta journal Das Ausland.21 Schnurrer’s map was the first attempt to visualize, on a world scale, the distribution of disease. As he informed the Munich audience, his inspiration for the cartographic representation of the distribution of diseases was derived from the geographic work of Eberhard Zimmermann (1743–1815),22 Carl Ritter (1779–1859),23 and the Danish climatologist and plant geographer Joakim Frederik Schouw (1789–1852).24 In his paper accompanying the presentation of the map, Schnurrer discussed a variety of methodological problems inherent to his project. He objected to the notion that diseases exist independently of their human hosts and paid considerable attention to the difficulties of graphically representing topographical, historical, and scholarly information. Schnurrer intended to distribute his data over a series of maps of different scales, of which only the first—the global one—was published (though in the report of the Munich meeting, a second map, limited to Europe, was mentioned).25

What did Schnurrer hope to attain in plotting the incidence of disease over geographical space? To answer this question it is necessary to see him against the historical background of the widespread controversy over the contagious character of diseases, a controversy that had far-reaching implications—as Johanna Bleker

20 According to the report on the meeting in Oken’s Isis, there had also been shown a ‘Charte von Europa mit den endemicen Krankheiten’, Isis, 1828, 21, (5–6): col. 520.
21 Die geographische Vertheilung der Krankheiten, vorgelesen in der Versammlung der deutschen Aerzte und Naturforscher zu München den 22 Sept. 1827. Von Dr. Schnurrer. (Mit einer Charte), Das Ausland, 30 March 1828, no. 90: 357–9.
23 One of the most famous geographers of the time, see Schmithüsen, note 22 above.
25 Isis, see note 20 above.
Figure 1: 'Charte über die geographische Ausbreitung der Krankheiten', in 'Die geographische Vertheilung der Krankheiten, vorgesehen in der Versammlung der deutschen Aerzte und Naturforscher zu München den 22 Sept. 1827. Von Dr. Schnurrer. (Mit einer Chart)' Das Ausland, 30 March 1828, no. 90, pp. 357-9.
Figure 2: ‘Charte der Verbreitung der Cholera morbus vom Aug. 1817 bis gegen Ende Oct. 1830’, in F Schnurrer, Die Cholera morbus, ihre Verbreitung, ihre Zufälle, die versuchten Heilmethoden, ihre Eigentümlichkeiten und die im Großen dagegen anzuwendenden Mittel. Mit der Charten ihres Verbreitungsbereieks, Stuttgart and Tübingen, Cotta, 1831.
Figure 3: 'Charte der Verbreitung der Cholera morbus vom August 1817 bis Ende Julius 1831', in F Schnurrer, Die Cholera morbus, second edition, Stuttgart and Tübingen, Cotta, 1831.
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and others have pointed out—for commercial trade, state power, and social stability.  
At the end of the seventeenth century, the English physician Thomas Sydenham (1624–1689) had developed a method for classifying diseases that was analogous to the systems used to classify plants.  
Later, at the turn of the eighteenth century, it was still an open question whether diseases were fixed, as organic species were believed to be, and, if so, how it was that new diseases periodically originated. Thus, by the first decade of the nineteenth century, a number of naturalists began to investigate the natural history of diseases. Schnurrer mentioned, among others, Philipp Friedrich Hopfengärtner (1771–1807), August Heinrich Ferdinand Gutfeldt (1778–1808), and Joachim Dietrich Brandis (1762–1845).  
He himself considered diseases as constant entities that were susceptible to environmental influence, stressing the value of empirical study. His goal was to achieve a complete Enunciatio Facti—a work of such encyclopedic scope that it would render all subsequent theories of contagion “superfluous”.  

The Map

Schnurrer’s major writings, in particular his Chronik der Seuhen, received much attention from doctors and historians, yet his 1827 map remained virtually unknown. In spite of the fact that he lectured to an international audience—for the Meetings of German Naturalists and Physicians attracted foreign participants—only a brief notice of Schnurrer’s presentation appeared in Lorenz Oken’s (1779–1851) Isis. Only in 1828 did the Naturforscherversammlungen begin publishing their own memoirs, and thus, in the case of Schnurrer and his map, it was up to the author to decide whether and where to publish. It may seem odd that Schnurrer had his map and Munich lecture published in the popular Cotta journal Das Ausland, despite Oken’s invitation to the speakers of the Munich meeting to contribute their papers to Isis. One reason for his choice may have been that he was an ardent reader of Cotta’s magazines, as he wrote to Cotta in 1830. Yet he may also have preferred a periodical known for the excellence of its illustrations and for its honoraria.  

28 Schnurrer, op. cit., note 13 above, preface.  
29 Ibid., pp. iii–iv.  
30 Isis, note 20 above.  
31 As indicated by the subtitle ‘Ein Tagblatt für Kunde des geistigen und sittlichen Lebens der Völker, mit besonderer Rücksicht auf verwandte Erscheinungen in Deutschland’.  
34 Schnurrer’s choice was ill-fated. Various bibliographies of Schnurrer’s works cite the map as a separately published sheet. None mentions the journal Das Ausland or Schnurrer’s programmatic comments at Munich. Furthermore, there is no indication how a similar map of disease in Berghaus’ Atlas may
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Figure 1 shows Schnurrer's map. At first glance, one is struck, if not confused, by the density of information. Little use was made of colour, as only yellow fever, plague, and cholera had yellow, red, and blue lines respectively under their topographic names. Global routes and historical patterns of the spread of epidemics remained unclear, since occurrences of the diseases from antiquity to Schnurrer's own times were superimposed.35 In the case of some diseases, such as the "particular irritability and nervousness of all polar peoples", the distribution stretched around the whole Eurasian arctic coast, but most of Schnurrer's indications were more localized or even anecdotal, referring to single reports from voyages of exploration. Schnurrer drew few lines to indicate areas of distribution of certain pathological phenomena, with the exception of the "Northwestern boundary of intermitting fever", which ran from Ireland in a slightly convex arch over to Karelia, taken up in Mongolia and continuing to Kamchatka and beyond. The cartographic idiom of Schnurrer's map resembled that of Zimmermann's animal geography, which also showed few lines of distribution (see Chapter 9 in this volume). Schnurrer's reluctance to use lines was odd, since in the lecture accompanying his map, he spoke extensively of areas of distribution.

... the intermitting fever, which characterizes man over the animals and mostly occurs only in adult age, is a disease which accompanies European man on his journeys, at least sometimes, but, according to the observations of Nil Dalberg, Debes, Manicus, and Kratsheninnikow, is not present on the islands to the north of Great Britain, on the Faeroe Islands, in Iceland, in Northern Sweden, and on Kamchatka, notwithstanding its marshes and moors. Within these latitudes, it occurs in all places where man shifts between opposing influences of the soil, and it even strikes the Indians in Spanish Guyana as soon as they are transplanted to the missions from their free existence in the woods, and even those inhabitants of unhealthy regions who exchange their residences for healthier ones.36

Other diseases that Schnurrer described in his Munich address were intermitting fever affecting the spleen, compared with two diseases affecting the thyroid: goiter and cretinism. The last part of his lecture dealt with recent epidemics that had spread over large areas of the globe: "cholera, the plague, and yellow fever". Schnurrer cited the distribution map of cholera by Alexandre Moreau de Jonnès (1778–1870) and the map of plague by Carl Christian Matthäi (1770–1847), though he seemed

have been inspired by Schnurrer’s effort. The contributor to the third edition of Berghaus’s Atlas did mention Schnurrer’s name, but no book or journal title, so he may well have been referring to his better known Chronik der Seuchen. Hermann Berghaus (ed.), Berghaus’ Physikalischer Atlas, 3rd edn, Gotha, Justus Perthes, 1892, Section VII, 'Atlas der Völkerkunde', ed. Dr Georg Gerland, p. 4.

35 Schnurrer once used a line to show that cholera moved from Ceylon to the island of St Louis near Madagascar.

well aware of the methodological shortcomings of their approach. At the beginning of the lecture, Schnurrer outlined the difficulties which differentiated his project from the models of plant and animal geography created by Zimmermann, Ritter, and Schouw. Since “diseases do not exist autonomously, as do other products of organic life, but are instead bound to the distribution of the latter, and especially that of man, registers of disease are dependent on maps of humankind”.38

After further remarks, on the difficulties involved in establishing the distribution of diseases by direct observation, Schnurrer continued: “Since diseases, like species of plants and animals, are at the same time expressions of the original formative force of the earth, and maintain inalterably their own character, their connective areas can be outlined on a global map”.39

In fact, Schnurrer proposed a whole atlas of maps based on the one he presented. A second map would encompass Europe, Western Asia to the east coast of the Caspian Sea, and the northern edge of Africa. A third of the same region was to represent the epidemic diseases historically, and a fourth one the epizootics (animal diseases). On an even larger scale, for each of the greater European states, Schnurrer proposed detailed topographical and historical maps, with all recorded dates of epidemics, together with further information on the nosological state of the disease and the topography of the place of outbreak.

Schnurrer did not produce any of the maps he proposed, but he did write a much less ambitious work that proved a major commercial success: a booklet on the cholera, Die Cholera morbus, published by Cotta in 1831, with a second edition the same year. This contained a map of the distribution of the contemporary cholera epidemic,40 with only a few dates and references to travel accounts (Figure 2), which were left out in the second printing (Figure 3),41 with the single exception of Alexander von Humboldt’s 1829 encounter with the cholera in Kirgyisia. Thus, the second edition of the map, though containing less information, appears to be more homogeneous, and methodologically more up-to-date.

38 “... daß die Krankheiten nicht wie andere Productionen des organischen Lebens ihre eigenthümlichen Existenzen haben, sondern an die Verbreitung dieser, zumal des Menschen, gebunden sind, und eine Verzeichnung der Krankheiten daher schon eine Charte des Menschengeschlechts, als ihres Substrats, voraussetzt.” Schnurrer, op. cit., note 21 above, p. 357, col. 1.
39 “Da jedoch die Krankheiten wie die Formen der Pflanzen und Thiere zugleich auch Æuferungen der ursprünglichen Bildungskräfte der Erde sind, und ihren unveritlgaren Charakter behaupten, so lassen sich auf einer Welt-Charte wenigstens ihre Verbreitungszirke einigermaßen andeuten.” Schnurrer, ibid.