THE DOCTOR AS WEATHERMAN: MEDICAL TOPOGRAPHY IN NINETEENTH-CENTURY NEW JERSEY

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INTRODUCTION

In the nineteenth century, New Jersey physicians considered local weather and soil conditions—medical topography, also called medical geography or medical climatology—to be important factors in judging the health of their localities. Many physicians kept careful daily records of rainfall, temperature, and winds, incorporating such information into their reports to the Medical Society of New Jersey (MSNJ).[1] Medical topography served as an organizing concept, helping to explain the bewildering array of endemic and epidemic diseases, broadly subsumed under the heading of "fevers," that constituted much of daily medical practice. Private practitioners in New Jersey, often isolated in rural practice, viewed their meteorological activities as a form of medical research, reinforcing their self-image as men of science. Concepts of salubrity in New Jersey's towns and countryside evolved in the course of the nineteenth century as physicians realized the limitations of medical topography and began to adopt new paradigms of health and disease based on the germ theory and the new public health movement. This paper examines the historical, intellectual, and professional foundations of medical topography in New Jersey.

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THE THEORETICAL BASIS OF MEDICAL TOPOGRAPHY

In *The Health of the Country: How American Settlers Understood Themselves and Their Land* (2002), historian Conevery Bolton Valencius examined the popular understanding of a healthful location in the nineteenth century. In general, higher altitudes, remote from marshy lowlands, were considered healthful. Most physicians in the mid-nineteenth century wrote confidently of the "state of the atmosphere," and of a concept known as "epidemic constitution." The authority for the "epidemic constitution" was Thomas Sydenham, a thoughtful seventeenth-century clinician known as the "English Hippocrates" for his emphasis on close observation of the patient.[2] Public health historian Dorothy Porter succinctly characterized Sydenham's theory of disease causation: "the ultimate agents of disease were the poisonous effluvia thrown up at various times from movements of the bowels of the earth."[3] Disease-bearing miasmas were believed to emerge from the soil through breaks in surface topography, releasing the putrid exhalations of human and animal waste and decomposing animal and vegetable organic matter.[4] This theory seemed to be supported by the well-accepted association between periodic fevers and swampy ground; malaria (literally "bad air") was thought to be transmitted by the airs that blew across swamps and marshes. Thus it behooved physicians to familiarize themselves with local soil conditions and land formations. Health and sickness were local phenomena, and localities were seen as healthy or sickly as they moved through the seasons.

Unlike modern physicians who tend to distrust medical textbooks and articles that are more than a few years old, physicians in the nineteenth century read and cited the works of distinguished physicians of previous centuries. As Valencius explains, Sydenham's "positing of an 'epidemic constitution' of the surrounding atmosphere during outbreaks of sickness was the mainstay of a new science of medical meteorology, one based on quantification and statistical thinking."[5]

In the succinct formulation of historian of medicine Charles Rosenberg, the "body was seen, metaphorically, as a system of dynamic interactions with its environment." The equilibrium of the body was inseparable from factors such as heredity, emotions, and habits, as well as climate and topography.[6] The medical establishment insisted that only the properly prepared physician had the experience and knowledge to weigh the complex interactions of hereditary disposition, constitution, environment, and the prevailing condition of the atmosphere in establishing diagnosis, prognosis, and a course of treatment.

MEDICAL TOPOGRAPHY IN THE NEW NATION

Pragmatic nineteenth-century American medical schools focused on turning out general practitioners for a frontier nation. Not surprisingly, medical research in the United States lagged far behind that of Europe.

Nevertheless, many local practitioners found intellectual satisfaction in investigating the topographical and climatic features of their towns and surrounding countryside and in presenting their findings to their county medical societies.[7] Such research—for in the context of its time, it was indeed scientific research—helped the practitioner organize the confusing spectrum of diseases seen in daily practice and fit well with observed seasonal visitations of fevers, often characterized by such descriptive terms as "summer complaint" (infant diarrhea). Respiratory afflictions such as pneumonia and "la grippe," dysenteries or fluxes, periodic fevers (usually malaria), and bilious fever (often typhoid fever) all had their seasons.

In the 1830s, theories about the cause of epidemic diseases in America included such "cosmotelluric" phenomena as solar/lunar cycles, comet activity, vaguely understood properties of electricity in the atmosphere, and "mineral fermentations" of the earth. A theory called "insensible meteoration," advanced by a prominent professor of the theory and practice of medicine at the College of Physicians and Surgeons of New York, postulated an etiologic role for the mixture of gases in the atmosphere under the influence of an "electric fluid."[8]

Medical meteorology and topography became national, even international, scientific undertakings. Descriptive and tabular reports by local physicians "filled 19th-century scientific and medical journals" until a decade or so after the Civil War. Such observations, bearing the cachet of contemporary European science, were a search for "broad correlative insights in the minute exercises of local inquiry."[9] New Jersey physicians were thus part of a broader scientific movement. The premier American example of this kind of medical science was Daniel Drake's epic work, *Principal Diseases of the Interior Valley of North America* (1850), "the high water mark in many ways of medical natural history in America."[10] After the Civil War, the emphasis in medical research would shift from observing and recording nature to active experimentation in the laboratory.

MEDICAL METEOROLOGY AND TOPOGRAPHY IN NEW JERSEY

New Jersey, a relatively populous state with no medical schools, prestigious academies, or large hospitals, looked to Philadelphia and New York for education and expertise. But even provincial doctors could participate in the scientific study of climate and its correlation with disease. Members of New Jersey's local and county medical societies routinely reported on the prevailing diseases in their cities and rural towns. Decades before health statistics were collected by local and state agencies, a standing committee of the MSNJ collated the subjective impressions of "reporters" from each district (county) society. This task was complicated by the spotty participation of many county medical societies and a lack of guidelines for collecting or reporting information. Occasionally, enthusiastic and energetic physicians prepared full length articles on the climatology of their locale. As early as 1787, William Burnet of Newark advised his colleagues that the physician who wished to "advance the healing art" carefully record in each case the symptoms, age, and constitution of the patient, as well as "the situation of the place and state of the liver."[11]

The fifteen attendees at the 1812 meeting of the MSNJ appointed two physicians to "carry the 26th section of the By-Laws into execution, viz.: to make as accurate and extensive meteorological observations as circumstances will allow, and lay the same before the Society at their next meeting."[12] Nothing systematic came of this, but thenceforth, the regular reports from the constituent county medical societies almost invariably included subjective local meteorological observations and, in some cases, tabulated data. For example, in 1822, William Pierson of Orange sent to the state medical society a table of the average local monthly temperature, winds, rainfall, and snowfall in his town, noting that "diseases of usual occurrence and incident to our climate have made their appearance." Commenting on an intermittent fever during the spring and summer, he wrote: "Respecting the causes of this fever, I have said nothing, for I know nothing in our climate or the topography of this district which will satisfactorily account for the generation of miasmata (the fruitful source of intermittents [i.e. malarial fevers]) more [in the recent] past than in former years."[13] Jabez Goble reported from Newark that the cold and humid atmosphere of spring had favored the production of croup, which claimed the lives of many children.[14] In 1822, Stephen Hedges from Newton in Sussex County reported that his area was prone to fevers, as might be expected from an area with limestone rocks and hollows and depressions in the earth.[15]

In the antebellum years, American disciples of French medical empiricism rejected neat, abstract, rationalistic systems of disease in favor of empirical knowledge gained by meticulous observation of the patient in life and death. However, many local physicians outside the American medical elite either rejected the new empiricism or lacked the sophistication to transcend the comfortable old theories of disease. In 1835, for example, Stephen Congar of Newark submitted a treatise on "the reigning constitution of the atmosphere" to the state society. Appealing to the still-persuasive pronouncements of the Hippocratic corpus and the works of past European masters, Congar stressed the "tendency of the present reigning constitution of the atmosphere to induce an inflammatory diathesis of the system" in diseases such as variola (smallpox), scarlatina, erysipelas, catarrh, and pneumonia which had afflicted Newark in the previous year. Congar concluded that "the modifications of diseases, and consequently of their treatment, should lead to a careful observation of its nature [i.e. the nature of the atmosphere] by every intelligent practitioner."[16] Such reports continued into mid-century. Franklin Smith of Sussex County noted with pleasure that a dry summer and "uniformly cold winter," together with the "natural salubrity of the country has made the year 1856 one long to be remembered by the doctors." Smith went on to educate his colleagues: "That the influence of the soil and location may be better understood in describing the diseases, I will give a short description of the geology and drainage of this section of the State."[17]

THE LIMITATIONS OF MEDICAL METEOROLOGY

After a century of observations and reports by generations of New Jersey physicians, remarks on meteorology and topography in reports to the MSNJ seemed at times to be little more than a ritualistic exercise. When a global cholera pandemic struck New Jersey in 1833, Stephen Pennington of Newark focused on filth, contagion, and individual predisposition. Weather and topography, except for a single reference to a house near the river, were never considered. Nevertheless, he felt bound to begin his report on the general health of his district (before turning to cholera) with the customary meteorological reflection, noting that the area had escaped the debilitating effect of "successive hot days."[18]

Cholera returned in 1849 and 1854, as global epidemics reached New Jersey. An analysis of the meteorological tables published in the *Newark Daily Advertiser* during the cholera years led a local physician to observe that the mean temperatures of the years preceding the cholera epidemics were a degree higher than the mean temperatures during the cholera years. His report contained no analysis of his findings; presumably, the observation itself was felt to be of sufficient interest to the members of the medical society.[19]

In the decades prior to the development of the germ theory of disease, meteorological records often failed as an organizing concept, and thoughtful physicians admitted their confusion as early as the 1820s. Ephraim Bateman of rural Cumberland County observed in 1822 that malarial fevers in his district were as common in the high grounds as in the marshy areas, a pattern inconsistent with the received wisdom of medical geography which viewed malaria as synonymous with "swamp fever."[20] Fitz Randolph Smith of New Brunswick reported that intermittent fever (i.e., malaria) had spared the city, but was rampant in the surrounding country. In this instance, as well, "the highest and driest situations were equally obnoxious with the lowest [i.e. marshy and miasmatic] grounds." The "standing committee" of the MSNJ suggested that a "series of accurate meteorological observations" might help resolve the confusion.[21]

As public health and microbiology became part of the medical discourse, some physicians attempted to provide context and analysis for their climatological observations. Meteorology and topography were no longer ends in themselves, but were resituated within more modern formulations of healthfulness. William Johnson of Whitehouse in Hunterdon County commented on an epidemic of dysentery in 1851 in a report submitted to the fledgling American Medical Association. "Perhaps," he wrote, "some unappreciable atmospheric distemperature may have been the real cause of this epidemic." Then too, the summer had been unusually warm and dry, with a scarcity of water and wells rendered unfit for use, particularly on the red shale land. Johnson pointed out, however, that mountainous regions, where there was no shortage of good drinking water, suffered heavily from dysentery. Obviously unsatisfied by a purely meteorological or telluric explanation, Johnson turned to the alternative theory of contagion: "Contagion has in my opinion a very great influence on the spread of this disease. Notwithstanding all the caution given there was great and palpable neglect in removing excremental matters from the chambers of the sick. . . ." Though he lacked the epistemological utility of the germ theory, this articulate and experienced clinician was anticipating the idea that environment and contagion might operate together to explain epidemic disease in much the same way as miasma and constitution were interdependent in older epistemologies. Johnson identified the key problem—lack of standardized reporting—that could only be solved through an efficient statewide reporting system and the hegemony of the bacteriological laboratory, both two or three decades away: "I have no statistics of this disease. The rate of mortality varied exceedingly in different neighborhoods and was no doubt influenced by the pathological views of those who had the supervision of the sick."[22]

The limitations of medical geography were confounded by the nineteenth-century concept of disease as a shifting and amorphous relationship between the body and the environment. Physicians referred to vague "epidemic influences." With improper medical management, a mild fever might turn into typhoid or yellow fever, a simple dysentery might blossom into cholera. One pattern of fever could shade gradually into another.[23] In 1858, in the "neighbourhood of Westfield, lying some seven or eight miles west of Elizabeth Town, the malarious influence which, in the other vicinities exhibited itself in the forms before named [i.e., the typical intermittent and remittent fevers of malaria], was developed in the form of dysenteric [i.e., diarrheal] affections, which prevailed. . . to a considerable extent and fatality in that township."[24] The concept of discrete diseases, particularly infectious diseases such as cholera and typhoid, developed along with the germ theory later in the century. While both malaria and typhoid might share some symptoms, they were distinct diseases—terms such as typhomalarial fever eventually disappeared from usage. In the late nineteenth century, microbiologists proved that malaria was a mosquito-borne parasitic infection, and that typhoid was transmitted through water-borne fecal bacteria.

NEW PARADIGMS OF HEALTH: SANITATION AND THE GERM THEORY

As the germ theory evolved in the latter half of the nineteenth century, leading clinicians and medical writers such as Austin Flint of New York struggled to fit current and incomplete knowledge about germs to epidemiological and environmental observations. In 1873, Flint attributed endemic diseases (such as typhoid which occurred regularly in a particular locale) to miasmas or atmospheric effluvia arising from the soil in the immediate district. Geographically widespread epidemic diseases such as smallpox seemed to be best explained by poisons, "viruses," or microscopic particles diffused through the air.[25]

In 1861, Henry Clark of Newark, an intellectually active older practitioner, wrote a paper entitled "The Medical Topography of Newark, New-Jersey."[26] Optimistically proclaiming the salubrity of Newark, "but a suburb of the great city of New York," (population 73,000) and the cities in its vicinity, Clark commented upon the well-drained "diluvial" deposits of sand and gravel which absorbed moisture and left a dry, healthful surface in parts of Newark, while other "alluvial" areas required man-made drainage.[27] At the juncture of Springfield Avenue and Market Street, hard shale prevented adequate drainage, as did the plateau above High Street, home to a large population of German immigrants.[28] This was indeed local medical topography. The marshy and malarial area of the city, "the home of our pauper population," would soon be rendered healthful by a planned drainage project.[29] Civil engineering, guided by public health principles, could correct the ill effects of unhealthy topography. The fatal cholera epidemics of 1832, 1849, and 1854 were more virulent in certain localities within the city, and Clark was confident that proper sewerage and sanitary measures could have prevented many deaths.[30] Clark's analysis stood at the interface of medical geography and public health, understood at the time as municipal housekeeping.

Although reductionist bacteriological explanations for epidemic diseases were not universally accepted, cities like Newark could begin to think about using sanitary science and civil engineering to turn noisome city slums into salubrious, well-drained wards. Urban poverty need not translate into disease. Taking a multifaceted approach, Lott Southard of Newark wrote in 1861: "Miasmatic diseases have been much less frequent of late. . . .The decline of [them] has been attributed to a variety of causes: season, temperature, location, sewerage, paving, and the enforcement of hygienic and sanitary laws. . . "[31] Meteorology and topography were still important, but their scientific context had been reframed.

By the 1880s, germ theory was increasingly hegemonic. In 1880, Edgar Holden, medical director of Newark's Mutual Benefit Life Insurance Company, prepared a detailed public health report, graced by lavish graphs, tables, and maps, for the company's directors. Subjective observations about topography had given way to a more rigid study of the behavior of bacteria-laden sewage as it penetrated the soil to find its way into wells many yards away.[32]

The appalling state of the water supply to Newark, drawn as it was from the heavily polluted Passaic River, was a hot-button issue in those years. A pamphlet published in 1887, entitled "Shall We Continue to Use the Sewage Polluted Passaic;—Or Shall We Get Pure Water?" featured a report by a Professor Leeds, who pointed out that simple observation (and smell) were insufficient to determine toxicity of the water: "Whilst the taste, odor, and amount of putrefying filth in the Passaic River is ordinarily greater in the Summer and Autumn than in colder seasons of the year, I am by no means persuaded that it is most dangerous to health during the times when it tastes worst." Thus, the laboratory was replacing the evidence of the senses, however informed by medical knowledge and experience, as the arbiter of Newark's healthfulness.[33] Pamphlet contributor Benjamin Dowling, M.D., of Camden, uncertain as to the exact nature of the "virus" of typhoid fever (he suspected it was a germ or bacillus) warned of "water that has been filtered through ten and even one hundred feet of sand and earth, coming out clear, but still bearing the poison in sufficient quantities to produce fever and cause death."[34]

A similar message, firmly rooted in bacteriology and sanitation engineering, characterized the address of E.L.B. Godfrey of Camden to the MSNJ in 1900. The discovery of the typhoid bacillus by a German bacteriologist in 1880 reconfigured the discussion of sanitation; observations of climate and soil conditions and vague notions of pollution gave way to scientific management of the water supply based on bacteriology. In Godfrey's words: "The discovery of the [typhoid] bacillus has placed typhoid fever among the preventable diseases, and has, therefore, thrown the responsibility for its prevalence upon both the profession and the municipality."[35] Godfrey provided data to show that the sinking of artesian wells along the Delaware, thought to be heavily infected with typhoid bacilli from the sewage of Philadelphia and Camden, had been followed by a decrease in typhoid cases and deaths.

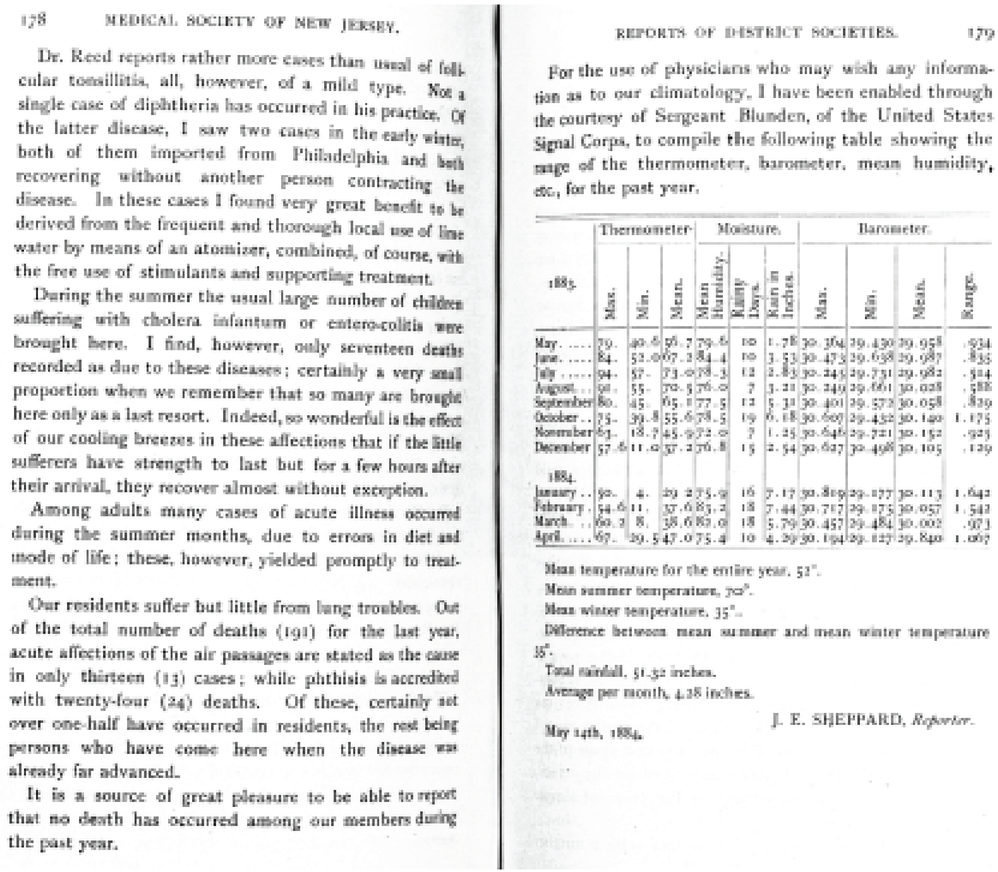
MEDICAL TOPOGRAPHY: CO-EXISTING WITH THE GERM THEORY AND SANITARY SCIENCE

As late as 1882, Ezra Mundy Hunt of Metuchen, a modern sanitarian and New Jersey's leading public health figure, saw local topography and climate as an important factor in the health of the state. Hunt was a founder of the New Jersey Sanitary Commission in 1875 and one of the first presidents of the American Public Health Association in 1882. At a meeting of the MSNJ in 1882, Hunt proposed the following resolution:

> Whereas, the influence of climate upon disease is one of the most important means of promoting cure. . . . Resolved, that we strongly commend the action of the Board of Health, of the State of New Jersey, in undertaking the observation and record of facts relating to geological structure, soil, topography, rainfall, relation to seas and other bodies of water, and other local conditions by aid of which we may arrive at well-sustained conclusions, in regard to the cause of disease, and be better enabled to select resorts adapted to maladies of different kinds and phases.

Hunt further advised that special attention ought to be paid to climatological and topographical conditions of the rapidly developing Jersey shore to determine if specific locales were "worthy of study, as modifying disease and toning the general system."[36] In fact, this enterprise was well underway. In 1884, J. E. Sheppard of Atlantic City tabulated the meteorology of his locale "for the use of physicians who may wish any information as to our climatology."[37] Fellow physician Boardman Reed urged physicians across America to send their ailing patients to the healthful seaside resort.[38] Even after the germ theory was generally accepted and European investigations into physiology and pathology were regular features in American medical journals, some physicians clung to the congenial practice of backyard meteorology. Perhaps some rural and small-town New Jersey physicians, isolated from America's fledgling urban medical centers, derived satisfaction by demonstrating that their locale was important and worthy of scientific study.[39]

One of New Jersey's last great champions of meteorological tabulations was George Larison of Lambertville, Hunterdon County. Larison served a medical apprenticeship with a local physician before graduating from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Dr. Reed reports rather more cases than usual of follicular tonsillitis, all, however, of a mild type. Not a single case of diphtheria has occurred in his practice. Of the latter disease, I saw two cases in the early winter, both of them imported from Philadelphia and both recovering without another person contracting the disease. In these cases I found very great benefit to be derived from the frequent and thorough local use of lime water by means of an atomizer, combined, of course, with the free use of stimulants and supporting treatment.

During the summer the usual large number of children suffering with cholera infantum or entero-colitis were brought here. I find, however, only seventeen deaths recorded as due to these diseases; certainly a very small proportion when we remember that so many are brought here only as a last resort. Indeed, so wonderful is the effect of our cooling breezes in these affections that if the little sufferers have strength to last but for a few hours after their arrival, they recover almost without exception.

Among adults many cases of acute illness occurred during the summer months, due to errors in diet and mode of life; these, however, yielded promptly to treatment.

Our residents suffer but little from lung troubles. Out of the total number of deaths (191) for the last year, acute affections of the air passages are stated as the cause in only thirteen (13) cases; while phthisis is accredited with twenty-four (24) deaths. Of these, certainly not over one-half have occurred in residents, the rest being persons who have come here when the disease was already far advanced.

It is a source of great pleasure to be able to report that no death has occurred among our members during the past year.

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For the use of physicians who may wish any information as to our climatology, I have been enabled through the courtesy of Sergeant Blunden, of the United States Signal Corps, to compile the following table showing the range of the thermometer, barometer, mean humidity, etc., for the past year.

	Thermometer.			Moisture.			Barometer.			
1883.	Max.	Min.	Mean.	Mean Humidity.	Rainy Days.	Rain in Inches.	Max.	Min.	Mean.	Range.
May	79.	40.6	56.7	79.6	10	1.78	30.364	29.430	29.958	.934
June	84.	52.0	67.3	84.4	10	3.53	30.473	29.638	29.987	.835
July	94.	57.	73.0	78.3	12	2.83	30.245	29.731	29.982	.514
August ...	91.	55.	70.5	76.0	7	3.21	30.249	29.661	30.028	.588
September	80.	45.	65.1	77.5	12	5.31	30.401	29.572	30.058	.829
October ..	75.	39.8	55.6	78.5	19	6.18	30.607	29.432	30.140	1.175
November	63.	18.7	45.9	72.0	7	1.25	30.646	29.721	30.152	.925
December	57.6	11.0	37.2	76.8	15	2.54	30.627	30.498	30.105	.129
1884.										
January ..	50.	4.	29.2	75.9	16	7.17	30.819	29.177	30.113	1.642
February .	54.6	11.	37.6	83.2	18	7.44	30.717	29.175	30.057	1.542
March ...	60.2	8.	38.6	83.0	18	5.79	30.457	29.484	30.002	.973
April	67.	29.5	47.0	75.4	10	4.29	30.194	29.127	29.840	1.067

Mean temperature for the entire year, 52°.

Mean summer temperature, 70°.

Mean winter temperature, 35°.

Difference between mean summer and mean winter temperature 35°.

Total rainfall, 51.32 inches.

Average per month, 4.28 inches.

J. E. SHEPPARD, *Reporter*.

May 14th, 1884.

Figure 4.1
Typical report on illness and weather conditions of a particular region. J.E. Sheppard. “Report of District Societies (Atlantic County),” *Transactions of Medical Society of New Jersey* (1884): 176–79.

the Pennsylvania College of Medicine in 1858. In his regular medical reports to the state medical society between 1872 and 1891, he routinely included a detailed local meteorological table. An energetic and busy practitioner, Larison, probably assisted by medical apprentices, recorded mean temperature thrice daily, as well as rainfall, depth of snow, number of clear days and number of cloudy days.[40,41]

Nowhere, either in the reports to the state medical society or in his original manuscripts, is there evidence that Larison attempted to correlate his tabulations with specific medical events, though, like all physicians of the day, he was concerned with seasonal afflictions. In 1886, Larison observed that cholera infantum (summertime infantile diarrhea) had decreased in incidence thanks to the "sanitary advice from our physicians—keeping the children from heated apartments." Larison used the term "zymotic" to refer to diseases which were thought to originate in fermentation reactions in the atmosphere, a transitional concept bridging miasma theories and the germ theory of what we now refer to as infectious diseases.[42] Notes in a surviving bound manuscript, now at Fairleigh Dickinson University, suggest that Larison enjoyed observations of nature, as he interleaved commentaries on pasturage, sleighing, and fishing, along with clippings about extreme weather conditions elsewhere.[43] As president of the MSNJ, Larison told his colleagues in 1875 that "[g]eology, physical geography, meteorology and climatology solve many abstruse problems that underlie the first principles of sanitary work."[44] Larison's statement remains true today, although the paths of the public health officer and the practicing physician diverged over the past century.

T. J. Smith of Bridgeton in Cumberland County continued to make meteorological observations at least through 1883. He seems to have invested a great deal of intellectual energy in the project, but perhaps felt that the time had passed when a modern physician could press the case for meteorology to a sophisticated medical audience. He contented himself with equivocation and generalization: "Without assuming that the atmospheric phenomena and the influenza are to be viewed in light of cause and effect, it may be instructive to compare the averages of temperature in 1882 and 1883. . . this excess of snow and snowy days added to an excess of northerly and north-easterly winds, with sudden fluctuations of the barometer, furnish elements of more than ordinary severity on the human system."[45]

In some cases, boosterism played a role as local physicians sought to promote the healthfulness of their locales. This became especially important later in the nineteenth century as authoritative physicians, for a variety of reasons including their own financial interests, championed particular spas or sanitariums for the treatment of tuberculosis.[46] Enthusiastic local physicians prepared lengthy monographs on the medical topography of their locales. With the increasing attraction of New Jersey as a "country residence" for a new generation of commuting New York businessmen and merchants, "a locality at once elevated above marshes, removed from the sea air, and readily accessible, is a desideratum." So wrote Stephen Wickes of Orange, New Jersey in 1859. Having observed the effects of Orange's "climate upon those in health and disease," Wickes felt justified, despite an admitted lack of statistics, in stating that Orange was a healthy town, characterized by an "elastic inland climate" for those who find the coastal sea air too stimulating. The mountainous elevation of Orange and the attenuated sea air from nearby bays led Wickes to conclude that "in cases of tuberculous disease, a removal to this locality does exert in many, and I may say in most cases, a marked effect for good."[47]

Although excluded from the ranks of the MSNJ as "quacks," medical cultists such as the water-cure doctors expanded effusively in their promotional literature on the salubrious charms of the bucolic locales in which they built their lavish health resorts. Owners of the Orange Mountain Water Cure in Essex County (1848–1857), for example, championed the "pure mountain spring water, beautiful and retired walks through the woods and upon the mountains for several miles in extent and shielded from the winds in winter and the sun in summer; springs of soft water along the various paths, and picturesque scenery."[48]

CONCLUSION

New Jersey physicians participated in the national and international endeavor to correlate local environment with prevailing patterns of health and sickness in their towns and cities. When public health reform moved onto center stage, physicians emphasized the *unhealthfulness* of New Jersey's growing cities as they sought to establish their public and professional authority as guardians of civic health. As the nineteenth century progressed, time-honored concepts of environment, climate, and topography were gradually reframed in the new language of public health and the germ theory of disease. Observations of nature, "receptive, passive, and recording. . . but not likely to contribute in any very specific way to better practice," gave way to laboratory research and new diagnostic technologies at the bedside.[49] Advances in medical science notwithstanding, medical topography and meteorology resonated with local New Jersey practitioners until the end of the nineteenth century, meshing comfortably with old and new theories of disease and confirming the status of New Jersey practitioners, often isolated in rural or town practices, as members of a scientific profession.

Notes

1. *Transactions of the Medical Society of New Jersey* (*TMSNJ*) dating from 1766 (the founding of the society) until 1858 were collected and published as a single volume with sequential paging by the MSNJ in 1875. This is abbreviated in the references as *TMSNJ, 1776–1858*. From 1858 to 1903, the *TMSNJ* were issued annually in separate bound editions and are abbreviated *TMSNJ* using journal reference format. In 1904, the *TMSNJ* were replaced by the edited *Journal of*

the Medical Society of New Jersey. Bound editions of the *TMSNJ* are available at Special Collections and University Archives, Rutgers University where most of the research was conducted. The assistance of the reference staff is gratefully acknowledged.

2. Conevery Bolton Valencius, *The Health of the Country: How American Settlers Understood Themselves and Their Land* (New York: Basic Books/ Perseus, 2002), 181–2.
3. Dorothy Porter, *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times* (London: Routledge, 1999), 82.
4. Caroline Hannaway, "Environment and Miasma," in *Companion Encyclopedia of the History of Medicine*, ed. W. F. Bynum and Roy Porter (London: Routledge, 1993), 295.
5. Valencius, *Health of the Country*, 182.
6. Charles E. Rosenberg, "The Therapeutic Revolution: Medicine, Meaning, and Social Change in Nineteenth-Century America," in *The Therapeutic Revolution: Essays in the Social History of American Medicine*, ed. Morris J. Vogel and Charles E. Rosenberg (Philadelphia: University of Pennsylvania Press, 1979), 5–6.
7. Ronald L. Numbers and John Harley Warner, "The Maturation of American Medical Science," in *Sickness and Health in America: Readings in the History of Medicine and Public Health*, 3rd ed., rev., ed. Judith Walzer Leavitt and Ronald L. Numbers (Madison, WI: U Wisconsin Press, 1997), 138. The essay appeared originally in *Scientific Colonialism: A Cross-Cultural Comparison*, ed. Nathan Reingold and Marc Rothenberg (Washington, DC: Smithsonian Institution Press, 1987), 191-214.
8. Raymond N. Doetsch, "Daniel Drake's Aetiological Views," *Medical History* 9 (1965): 365–73.
9. Valencius, *Health of the Country*, 164–6.
10. The full title is *A Systematic Treatise, Historical, Etiological, and Practical, on the Principal Diseases of the Interior Valley of North America, as they Appear in the Caucasian, African, Indian, and Esquimaux Varieties of its Population*; Donald Fleming, *William H. Welch and the Rise of Modern Medicine* (Boston: Little, Brown and Co., 1954), 10.
11. William Burnet, "On the Nature and Importance of the Healing Art," *TMSNJ, 1766–1858* (ca. 1787): 55–61 (quotation, 59).
12. William McKissack, *TMSNJ, 1776–1858* (1812): 133–4 (quotation,

134).

13. William Pierson, "Report for Essex County," *TMSNJ, 1766-1858*: (1822): 209–12 (quotations, 209, 211).
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