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FACT AND FANCY IN EARLY ACCOUNTS OF MINNESOTA'S CLIMATE

Literature descriptive of Minnesota during the periods of the territory and early statehood reveals numerous evidences of an active campaign to induce prospective agrarian settlers to locate within its borders. Boldly, and in terms designed to be readily understood by the general public, writers set forth the advantages of Minnesota as a place of residence—in newspaper editorials, in immigrant guides and handbooks, in pamphlets sponsored by numerous agencies, and in longer and more dignified volumes published in America and abroad. Descriptions and interpretations of the climate of the new territory and state inevitably played conspicuous roles in this early literature. The two decades following 1850 were most prolific in climatic descriptions, though the subject continued to provoke written comment, with some shifting of emphasis, until the turn of the century. In early accounts of Minnesota, the amount of space allotted to its climate far exceeds that given over to any other aspect of its geography.

The extensive descriptive literature was essentially a by-product of state-making problems then confronting Minnesota; hence climatic descriptions included in them are colored by these problems. The descriptions also reflect the enthusiasm which was aroused as Minnesota emerged from its original obscurity simply as a portion of the new Northwest, to become a recognized territory at a time when the tide of migration was pushing westward. The possibility that the descriptions register in part the stage of knowledge

then reached in the study of climate in general must not be overlooked. Certainly, climatic descriptions of territorial Minnesota could not be expected to rise above the level of the subject as it was then understood—an especially important consideration because the period witnessed a remarkable advance in the comparative study of climates. Thus, in order to evaluate the historical significance of written comments on Minnesota's climate, it is necessary to inspect them in the light of contemporary knowledge of systematic climatology. When viewed solely from the standpoint of present understanding in this field, these truly significant writings may appear unimportant, or trivial, or, in some cases, merely ridiculous.

From the point of view of state-making, it was obviously to the advantage of public and private interests to make out a good case for Minnesota's climate. Writers of climatic descriptions found this task easy. Climate is essentially an abstraction, allowing the author much opportunity for the manipulation of material and the choice of elements to be emphasized.¹ Moreover, as of the majority of climates, there was much to be said in favor of Minnesota's, and even its least desirable features could be shown to have some advantages. At the same time, climatic descriptions lack reality unless supported by accumulated data, and they vary in validity according to the degree of skill employed in their use and interpretation. By the time Minnesota had achieved territorial recognition, many climatic data had been collected at stations within its borders, especially at Fort Snelling.² Climatic descriptions of Minnesota in the

¹W. L. G. Joerg, in his review of "Geography and National Land Planning," in the *Geographical Review*, 25:180 (April, 1935), writes: "No single element of the environment is so uncertain, and hence so difficult to fix, as is climate. Not a concrete object, such as the rocky substructure, the soil mantle, or the vegetation cover of the earth's surface, of each of which the distribution and characteristics can be established by examination *in situ*, climate, like time, is an abstraction."

²The Fort Snelling records date back to 1822. These data, together with others observed at military posts, provide the basis for Lorin Blod-

fifties, therefore, cannot be cast aside as valueless because of prematurity, especially since climatologists, by projection of climatic laws then known, were speaking with authority about the climate of regions for which data were meager or lacking entirely.

The majority of writers on Minnesota's climate had recourse to and used various local climatic records, although their interpretation of the material was often at fault. Not until 1860 did any of the writers pretend to draw from the more authentic works then available, and many after that date appear to have been unaware of the existence of reliable sources. Among the early writers, the principal qualification for essaying works of this sort appears to have been a period of residence within the state. Characteristically, a writer on Minnesota warns his readers of his inability to do the subject of climate justice, but adds that "from a residence of over six years in Minnesota, I can safely say that the atmosphere is more pure, pleasant, and healthful, than . . . any other I have ever breathed on the continent of North or South America."³ In view of the various motives, sometimes selfish, which inspired these descriptions, and the lack of special training among those who wrote them, it is remarkable that the gulf separating these works from authoritative sources is no greater than is actually the case. The greatest disparity between them occurs when authors venture into the field of climatic explanations.

Writers of climatic descriptions during the territorial get's analysis of the climate of the Northwest, in his classic *Climatology of the United States* (Philadelphia, 1857). The data for the years from 1843 to 1854 appear without interpretation in the *Army Meteorological Register* (Washington, 1855). Data collected at Fort Snelling and at Sandy Lake are reproduced in the *Minnesota Pioneer* for September 27, 1849. Even earlier weather records were kept in and near Minnesota by Hugh McGillis and Alexander Henry, the younger, fur traders at Leech Lake, Fort William, and Pembina. Photostatic copies of these records, which cover parts of the years from 1804 to 1810, are in the possession of the Minnesota Historical Society.

³J. Wesley Bond, *Minnesota and Its Resources*, 64 (Chicago and Philadelphia, 1856).

period were aware that the public to whom their work was addressed had preconceived ideas about Minnesota's climate and that these ideas were prejudicial to the region. Consequently, much of the space devoted to the subject was used to combat these already developed prejudices, producing during the territorial period a literature of defense. The usual discussion of climate opens with a reference to that fact. "I am aware," writes an early enthusiast, that "the opinion generally prevails in the States, that the Territory is too far North to do anything at *farming*. Before coming here, I entertained the same opinion; but it is a mistake."⁴ Statesmen and politicians, through their contacts with people in various parts of the country, sensed the necessity of defending Minnesota's climate against the unfavorable opinions then prevailing. Governor Gorman voiced this opinion in his annual message to the legislature on January 18, 1855:

During the past year I have received almost innumerable letters from the middle states propounding a variety of questions about our territory, especially desiring to know if our winters are not very long, and so exceedingly cold that stock freezes to death, and man hardly dare venture out of his domicil.

Gorman advised that a pamphlet be issued setting forth the actual facts.⁵ Complaints of this sort appear intermittently in climatic discussions during the remainder of the century, although most frequently during the first years. Well-entrenched climatic ideas are, however, difficult to dislodge. Apparently exasperated with the tendency of the public mind to cling to early beliefs about Minnesota's climate, the author of a railroad pamphlet issued in 1879 states that "it is full time the public mind was disabused of all such fallacies."⁶

⁴ H. W. Hamilton, *Rural Sketches of Minnesota, the El Dorado of the Northwest*, 10 (Milan, Ohio, 1850).

⁵ *Council Journal*, 1855, p. 32.

⁶ St. Paul, Minneapolis and Manitoba Railway Company, *Facts about Minnesota*, 6 (St. Paul, 1879).

In a report on climate published in 1858, the state takes cognizance of the unfavorable and allegedly unwarranted opinions then prevailing about this aspect of Minnesota. This discussion of climate is precluded with this passage:

No region which at present engages the public mind, as a field for settlement, has been so grossly misrepresented in regard to peculiarities of climate as Minnesota. Fabulous accounts of its Arctic temperature, piercing winds, and accompanying snows of enormous depth, embellish the columns of the Eastern press, to the no little injury of this Territory.⁷

Some writers at this time, viewing Minnesota from a distance and convinced of the "severity" of its climate, opined that, from the long point of view, this supposed handicap would become an advantage. An excerpt from an article on Minnesota included in a magazine published in St. Louis is a case in point.

It is difficult for the inhabitants of more southern climes to realise the idea that a region so far north as Minnesota, especially on this continent, is susceptible of sustaining a dense population of intelligent and enterprising people. . . .

The severity of the climate in this region, instead of operating as a hindrance to its improvement, constitutes the strongest argument in favor of its future prosperity.

It was argued that the long winters would necessitate a large amount of labor during the summer and that this would lead to social combinations and intercourse. The cold winter, moreover, would invigorate the physical constitution.⁸

Having thus recognized their defensive position, writers on Minnesota's climate adopted offensive tactics, and it is hardly a cause of wonder that they generally overstated the case in its favor. The all-important fact which they wished to convey to the reader was that Minnesota's climate is distinctive or "peculiar" to itself. From the state-making angle this was an important point, if it could be established,

⁷D. C. Shepard, "Climatology of Minnesota," in *House Journal*, 1858, Appendix, p. 61.

⁸"Minnesota," in *Western Journal*, 4: 222 (July, 1850).

for other Middle Western states, especially Wisconsin, were competing for the same settlers. Inasmuch as these states were essentially on the same plane, so far as advantages of settlement were concerned, agencies interested in the peopling of Minnesota seized upon the abstract element of climate as offering the greatest possibilities for directing attention specifically to the territory.⁹

From the standpoint of the best climatological thought of the time, this emphasis on a distinct Minnesota climate was unwarranted, although one writer does refer to an "early distinction" between the climate of the Atlantic states and that of the Mississippi Valley, a distinction that, he hastens to add, "has been quite dropped, as the progress of observation has shown them to be essentially the same, or to differ only in unimportant particulars." In connection with this uniformity he states that "changes of temperature, and oscillations of every sort, strike over the eastern United States as changes would over any plane surface . . . and knowing what they are at a few places we may easily infer what they have been at all."¹⁰

Schoolcraft was the first to point out a special quality and advantage in Minnesota's climate not possessed by neighboring states, though in so doing he did not add to his stature as a man of science. Nevertheless, he had the courage to say that the advantage was not possessed by Wisconsin or Michigan; other writers, less courageous or more tactful, contrasted Minnesota's climate vaguely with that of the "Middle States" or the "East." Schoolcraft

⁹ Methods adopted by northwestern states in the fifties to attract immigrants and the resulting interstate competition are discussed by Theodore C. Blegen in "The Competition of the Northwestern States for Immigrants, in the *Wisconsin Magazine of History*, 3: 3-39 (September, 1919). The same author, with Livia Appel, traces the steps taken by Minnesota, in "Official Encouragement of Immigration in Minnesota during the Territorial Period," *ante*, 5:167-203. A study by Mr. Blegen of "Minnesota's Campaign for Immigrants" in the period of statehood appears in the Swedish Historical Society of America, *Yearbooks*, 11: 3-28 (1926).

¹⁰ Blodget, *Climatology of the United States*, 126, 129.

refers to the "prevalence of a valley current from the tropical latitudes up the Mississippi." He continues:

It is evident, from the scanty materials we possess, that this gulf current does not spend its force until it has well nigh reached the southern terminus of Itasca summit. It is certain that the extreme upper Mississippi escapes those icy winds from Hudson's and Baffin's bays, which are often felt, during the spring months, in northern Michigan and northern Wisconsin. The same latitudes which cross the lake country, give a milder climate in the valley of the upper Mississippi.¹¹

Later writers do not attempt to make out a mild climate for northern Minnesota, but several err nearly as greatly in other particulars. Between 1850 and 1855 several authors asked their readers to believe that, in Minnesota, extremes of temperature are rare and that sudden changes seldom occur. Thus, one states that "extremes are but 'few and far between'" ; another that the climate of Minnesota "is not subject to those frequent, sudden, and extreme changes of temperature, which characterize New York, Ohio, Indiana, Illinois, and the lower part of Wisconsin and Iowa" ; and still another maintains that "the climate of Minnesota is free from the sudden variations of temperature to which most other latitudes are subjected."¹²

No reliable authority then existed for assertions of this type, but they were probably not deliberate falsifications. They show a close resemblance to early editorials in the weekly *Minnesota Pioneer*, from which they may have been directly taken. James M. Goodhue, the first editor of the *Pioneer*, displayed a deep interest in, though often not a thorough understanding of, the climate of the territory, for he wrote several editorials on the subject and he gave space to communications on this aspect of Minnesota.¹³ Good-

¹¹ Henry R. Schoolcraft, "A Memoir on the History and Physical Geography of Minnesota," in *Minnesota Historical Collections*, 1: 86.

¹² J. W. Bond, "The Meteorology of Minnesota," in *Minnesota Historical Society, Annals*, 1850-51, p. 158-182; *Minnesota Year Book*, 1853, p. 23; *Rise and Progress of Minnesota Territory*, 2 (St. Paul, 1855).

¹³ Representative writings in the *Pioneer* may be found in editorials published on May 12 and August 9, 1849, and in a longer, more significant column appearing on April 8, 1852. The issues for May 16 and 23,

hue used the editorial style to such good purpose that some of his passages apparently caught the imagination of later writers. By frequent repetition, these passages were elevated to the rank of authentic statements, which their authors probably never anticipated, and were used in literature to which the editorial style was unbecoming. Goodhue's statement, "The whole world cannot produce a climate more salubrious than that of Minnesota," was in time to vie for first place, among those searching for pithy quotations, with William H. Seward's oratorical reference to Minnesota: "Here is the place—the central place. . . ." Other statements of the more exaggerated sort may have been inspired by the feeling that Minnesota's climate had been libeled, and they may represent the impressions of self-appointed spokesmen for those who, after a brief residence in the territory, were agreeably surprised to learn that the climate was more enjoyable than they had anticipated. They certainly show a faulty usage of terminology and a lack of understanding of the elementary fact that the tables of data which accompanied their descriptions were long-period *averages* and thus could not reveal *extremes*. Other descriptions issued in the same period, however, contain more realistic accounts of temperatures. A writer of 1856 remarks:

We have seen it stated that the climate is uniform and equable. This is a mistake. Perhaps no portion of the Union is subject to more frequent, or sudden and extreme variations of the thermometer than Minnesota, with the exception of those States bordering upon the great lakes.¹⁴

It is significant that the defense of Minnesota's climate centered upon its winter temperatures; little emphasis was placed at this time upon other aspects of the subject. The territory lay well to the east of the "Great American Desert 1850, contain, respectively, parts 1 and 2 of a long article by Dr. Thomas Foster of Philadelphia, entitled, "Original Sketch of the History and Geography of Minnesota Territory."

¹⁴*Immigrants' Guide to Minnesota in 1856*, 16 (St. Anthony, 1856).

ert" of the sixties, so no vital questions arose as to the adequacy of its rainfall. The suggestion has been made that agencies of adjacent states conspired to advertise Minnesota winters in such terms as to cause fear of them among prospective settlers. In any case there was a predisposition on the part of the general public then, as well as today, to magnify the importance of the northern latitude and the continental position of the territory.

The ten years following 1857 mark a significant period in the climatology of Minnesota. The writings of this period reflect more definitely than those of an earlier day what their authors genuinely believed about the climate. Though still highly colored by the local desire to attract immigrants to the state, climatic descriptions take on greater realism, born of a better understanding of Minnesota's climate through longer residence or more thoughtful consideration of climatic records and the works of climatologists.

During this period two studies achieved official status and thus had considerable influence upon ensuing literature.¹⁵ At this time also the Reverend A. B. Paterson, rector from 1857 to 1876 of St. Paul's Church in St. Paul, was preparing for posterity his remarkable meteorological records. From January, 1859, to March, 1876, with the exception of the two months of November and December,

¹⁵ One of these was *Minnesota: Its Place among the States*, published as the *First Annual Report* of the commissioner of statistics (1860). It contains, on pages 57-68, a study of the "Comparative Climatology of Minnesota" by D. C. Shepard. The other was an essay by Mary J. Colburn, for which she was awarded first prize in a competition conducted by the state board of immigration in 1865. This essay and one by William R. Smith, who received the second prize, make up an eighty-page pamphlet—*Minnesota as a Home for Immigrants* (St. Paul, 1865). Authors of climatic descriptions of Minnesota did not often acknowledge the sources of their information. The influence upon later literature of existing writings can only be traced, if at all, by the phraseology and general form of a work. Commonly, climatic descriptions were pieced together by taking appropriate paragraphs or passages from several existing sources.

1875, Paterson maintained a complete instrumental record of the daily weather in St. Paul.¹⁶ By 1860 most writers were ready to accept the idea that an area so large as Minnesota could not be expected to have the same climate throughout. Isothermal and isohyetal charts had come into use, having been included in scholarly volumes on the subject of climate, and in Arnold Guyot's *The Earth and Man* and elementary school geographies.¹⁷ Such material was, however, not always used with the skill and understanding which would have been expected of specially trained writers.

The Minnesota literature of this period contains descriptions of the seasons and the phenomena appropriate to each — temperatures, distribution of rainfall, snowfall, relative humidity — and passages on the relation of climate to productive industries and health. The winter received the greatest emphasis, because it was the season which, it was believed, had been “grossly misrepresented.” Speaking to an audience in New York in 1857, a Minnesotan said:

For a time I was somewhat troubled about the winters. These constituted the only objections I had ever heard urged against the Territory.¹⁸

Now frankly admitting the severity of the winter, writers

¹⁶ This manuscript record, in two volumes, now in the possession of the Minnesota Historical Society, commands the admiration of anyone who has attempted voluntarily to keep a continuous daily weather record of even the simplest kind. The remarkable perseverance of the man is indicated throughout the two volumes, the last page of which is revealing. The record is kept in full to March 9, 1876, but, owing to Paterson's enfeebled condition, with diminishing legibility. For the next eight days only three temperature readings per day are entered. The last entry is for 2:00 P. M., March 17, 1876. Paterson's death occurred two days later.

¹⁷ Arnold Guyot, *The Earth and Man* (Boston, 1849) was a translation from the French by C. C. Felton of a series of lectures delivered at the Lowell Institute in Boston. Guyot's *Physical Geography for Elementary Schools* must have been read, though perhaps not fully understood, by a large number of school children.

¹⁸ Ignatius Donnelly, *Minnesota, Address Delivered at the Broadway House, New York, 9* (New York, 1857).

nevertheless claimed that the sensible temperatures were high owing to low relative humidity. The following are characteristic references to this question, which has for ages eluded complete understanding:

Though the winter is cold . . . its severity is very much mitigated by the *extreme dryness of the air*.

One of the most striking peculiarities of this climate, is the great variation between the extreme cold of winter, when mercury congeals, and the intense heat of midsummer, when it stands for many consecutive days at 95° above zero, in the shade.

But these extremes afford no index to the real character of the climate of Minnesota.

Some writers, in an attempt to drive the point home, mistakenly comment on the absence of wind, as in the following extract:

The more intense periods of cold in the winter of Minnesota, are shorn of their severity, by the absence of winds and the peculiar dryness of the atmosphere, which imparts an elasticity and buoyancy to the spirits.¹⁹

Reference to the absence of wind was contrary to fact, but ample evidence existed to support the idea of a low winter humidity. The latter could also be claimed for the Dakotas, but in the sixties Minnesotans were not concerned with competition for immigrants from states farther west. In order to impress eastern readers with this advantage, it was said that outdoor laborers worked without heavy clothing in "zero weather," and in letters written "back East" reference was made to the absence of rain, the "steadiness" of the cold, and the small amount of snow.²⁰ Little was said at this time about the length of

¹⁹ Thomas Rawlings, *Emigration, with Special Reference to Minnesota, United States, and British Columbia*, 12 (London, 1864); *Minnesota as a Home for Immigrants*, 18; J. W. Barber and Henry Howe, *All the Western States and Territories*, 354 (Cincinnati, 1867).

²⁰ The letters of Leonard W. Dibble, written from 1865 to 1873 to members of his family in Connecticut, are probably typical of the period. They are now in the possession of the Minnesota Historical Society. From Le Sueur on December 21, 1866, Dibble wrote: "This has been

the winter—the objection which, in the course of time, was to be most frequently voiced. Writers in poetic mood painted the glories of the winter season; others, more philosophical and more widely read, pointed out that experts had demonstrated that crops produce more abundantly toward the northern limits of their range of growth.

The other seasons received less attention. Of the summer it was said that, though short, it was hot and, in part owing to the lengthening period of daylight with higher latitudes, was ample to mature the great staple crops. Nor was the fortunate coincidence of the period of maximum rainfall and the warmer season forgotten. This emphasis was quite in keeping with the best climatological thought of the time, and was not merely a bid for immigrants. That elusive transition season, Indian summer, was described in the usual idyllic terms—“a season worth a trip across the Atlantic to enjoy.”

To an English visitor of 1865 goes the distinction of having been the first and only one to see in the natural vegetation of Minnesota a significant difference between the climate of the northern and southern portions of the state and to read correctly the line of demarcation. He writes:

The pine, spruce, and other conifers, which characterize the Superior district, abruptly disappear between the 46th and 47th parallel, with its compact forest mass, and the sudden transition from the pine belt to the deciduous forms, distributed in groves and belts, conspicuously

the pleasantest month in this year. . . . The thermometer has ranged from five or six below zero to twenty above. Now this for Connecticut would be freezing cold I presume the difference is owing to our remoteness from the ocean or any large body of water. Giving us a drier atmosphere, which no matter how many degrees of cold are indicated by the mercury, is not so penetrating.” And, on February 10, 1867: “There has been but very little wind, and more bright sunshine than ever I saw in the East. . . . This is my third winter here and I have never known a rainy day in either. . . . The air is a still dry cold. here no one is ever seen with their teeth chattering. . . . the difference is so great it would seem proper if possible to have some variation in the thermometer, like an almanac calculated for different latitudes. it is impossible for you to understand the difference, without experiencing it.”

mark the important change of climate and soil which is expressed in the whole physiognomy of this district.²¹

The year 1867 marks the end of this period of realism in and progressive improvement of climatic descriptions of Minnesota. For the ensuing decade, climatic descriptions were doomed to be thrust aside in favor of what was then regarded as a closely related subject—the health-giving, restoring, and preserving aspects of climate. It was as though the decision had been definitely, if prematurely, reached that Minnesota's climate, as such, had been treated with the fullness which it merited. "Had not fears been allayed?" and "Was not the public at last informed of the true facts?" were the questions which authors apparently asked themselves and answered affirmatively at this time. It seemed in order then to look more closely into the salutary aspects of Minnesota's climate.

To the scholar, who prefers to see progressive improvement in the presentation of an important field of knowledge, this is a disappointing period, for it was a time of stagnation, not to say degeneration, in the study of Minnesota's climate. On the other hand, the emphasis upon climate and health was based on ample precedent, and was closely in keeping with the beliefs held by numerous writers who regarded themselves, at least, as climatologists.²²

Writers of the preceding period assured their readers in

²¹ Thomas Rawlings, *The Confederation of the British North American Provinces*, 169 (London, 1865).

²² The nineteenth century bibliography on climate and health in the United States is quite extensive. An example is *The Climate of the United States and Its Endemic Influences* by Samuel Forry (New York, 1842). The learned Blodget, in his *Climatology of the United States*, appreciated that many of the data were contradictory, but nevertheless leaned toward the idea that climate directly caused diseases. "India itself," he wrote on p. 455, "has not been more certain to break the health of the emigrant than the Mississippi valley. . . . It is impossible to ignore facts so great and general as these, and impossible to avoid attributing this great condition to climate primarily." He also believed that the climate of the United States is "particularly favorable to the development of distinctive *miasma*" (p. 465). J. Disturnell's *Influence*

no uncertain terms that Minnesota was possessed of a healthful or salubrious climate. Schoolcraft observes that "malignant fevers seldom or never originate in these longitudes, north of latitude 44°" and that military surgeons "give a very favorable view of its diseases and their diagnosis under the effects of the climate," and he concludes that "longevity must characterize a country without fevers and congestions." Another writes that "all those diseases so prevalent in bilious climates, and which every summer and fall prey so unceremoniously upon one's health and spirits, are almost unknown." "The whole world," it had been said, "can not produce a climate more salubrious than that of Minnesota." Mary J. Colburn treats the subject briefly, but with great flourish. She relates that many people who left comparatively healthy climates in New England found "untimely graves in the rich soil of Indiana, Illinois, Missouri, and Iowa," but this was not true of those who went to Minnesota, where there were "no stagnant pools to send forth poisonous exhalations."²³ But such accounts were merely incidental to the main discussion.

In the period from 1867 to 1880 the subject of climate and health became the real issue, and the treatment of the subject, as well as that of climate itself, was taken over either by recovered invalids or by physicians working independently or in conjunction with the state board of health. A pamphlet issued in 1867 by Girart Hewitt set the style for this period by including a chapter on "The Climate of Minnesota," by a physician.²⁴ It was confidently asserted

of Climate in North and South America (New York, 1867) was used as a source by some local writers, although his reference to the "Siberian summer" of St. Paul was not to their liking (p. 110). He does refer to Minnesota, however, as a part of the great health-restoring region of the United States.

²³ Schoolcraft, in *Minnesota Historical Collections*, 1:87; Hamilton, *Rural Sketches of Minnesota*, 11; Bond, *Minnesota*, 28; *Minnesota as a Home for Immigrants*, 24.

²⁴ Girart Hewitt, *Minnesota: Its Advantages to Settlers*, 28-32 (St. Paul, 1867). The section on climate was probably written by John F.

that Minnesota's climate is one of the healthiest in the world. Malaria, for example, was absent there. This disease, it was explained, was caused by "emanations which arise from the earth" and "embody a subtle principle . . . constantly rising, like an imperceptible gas, poisoning the air." Other reasons given by Hewitt for the healthfulness of Minnesota are "perturbation of the air" caused by winds that are "not persistent or severe, but constitute rather a lively agitation of the air," and "dryness of the air." Emphasis was placed first on the absence of malaria in Minnesota, a definite bid for settlers from states farther south. It was not until 1871 that the emphasis was shifted to the virtues of the climate in the cure and prevention of consumption.²⁵

In 1873 the question of climate and health in Minnesota achieved recognition from the state board of health. In its earliest reports are to be found articles by physicians and reports of committees delegated to investigate this or that phase of the subject.²⁶ These papers, with the exception of

Williams, who himself issued a pamphlet, *The Minnesota Guide* (St. Paul, 1868). Hewitt came to Minnesota as an invalid in 1856 and recovered while in the state. A similar treatment is included in J. W. McClung, *Minnesota as It Is in 1870* (St. Paul, 1870), in which the section on climate consists mainly of testimonials by physicians and recovered invalids and of information for "invalids of all kinds."

²⁵ Two books published at this time show an equally complete lack of information about the climate of the Northwest and are of interest merely as illustrating the lengths to which writers went in order to prove their points of view — Brewer Mattocks, *Minnesota as a Home for Invalids* (Philadelphia and St. Paul, 1871), and Ledyard Bill, *Minnesota: Its Character and Climate* (New York, 1871).

²⁶ See A. B. Stuart, "Causes of Disease, Especially Epidemics," with an appendix by Dr. Franklin Staples; D. W. Hand, "Causes of Mortality"; A. B. Paterson, "Remarks on Climate of Minnesota"; Staples, "Influence of the Climate of Minnesota upon Diseases of the Lungs and Air Passages"; Albert E. Senkler, "Peculiarities of the Climate of Minnesota with Especial Reference to Its Dryness, and the Presence and Operation of Ozone" with a statistical record of meteorological observations; and a continuation of this statistical work, by William H. Leonard, in Minnesota State Board of Health, *Reports*, 1873, p. 20-27, 30-33; 1874, p. 84-87; 1876, p. 55-81, 83-127; 1878, p. 43-53. Henceforth, reference will be made to these papers without further citation.

that by Paterson and the data collected by Doctors Albert E. Senkler and William H. Leonard, reveal an astounding ignorance of the literature on climate in general and of that of Minnesota in particular. The physicians wrote learnedly on the subject of health, but as to the relation between climate and health, their conclusions were contradictory.

Dr. D. W. Hand expresses the belief that the recovery of patients from serious diseases in the Minnesota climate was more certain than "where it is warm and moist"; and he relates that, due to low relative humidity, fatal cases of sunstroke are almost unknown and deaths by freezing are exceptionally rare because, although the winter cold is intense, "it does not come unexpectedly as in milder climates." This was surely a perversion of the facts of local climate as they had been known for at least two decades. Dr. A. B. Stuart was concerned to discover that "conditions of heat and moisture are coincident for a term long enough to produce disease," especially because there are large swamp and lake surfaces "in which vegetable debris, the other element of paludal or miasmatic poison, abounds." Dr. Stuart was not an advocate of artificial drainage because, he said, in a drained area "disease will result as surely as effect follows cause."

Apparently in all seriousness, the committee for which Dr. Stuart reported concluded its remarks on the causes of disease, especially epidemics, with these observations, attributed to Dr. William W. Sweney and inspired by the increasing frequency of epidemic influenza.

Since the completion of the Pacific Railway, or for four years past, every year has witnessed at least one epidemic. . . . Can it be possible that direct iron communication from ocean to ocean, has changed, disturbed or modified the normal electrical condition of the atmosphere, and thus changed or modified the climate and diseases of the countries adjacent to its course?

Dr. Stuart concurs, at least as to the causes of "miasmatic diseases." He writes:

The disease cause, remaining either in the human system or upon the surface of the earth, is liberated and disseminated by the heat of the sun in the spring. . . .

. . . In marshy or miasmatic districts, those who dress in flannel or its equivalent are less liable to be attacked by such diseases.

More praiseworthy is the report of a committee appointed to investigate the influence of climate and other factors upon the diseases of the air passages, though it revives what were then threadbare ideas about Minnesota's climate. Three of the conclusions of the committee are:

. . . That, owing to our geographical position, our altitude, the general physical condition of the surface of the country, the character of the soil, the temperature and comparative dryness of the atmosphere, which affect the electrical and other qualities of the air, and especially the character of the sun's light, and the freedom of the air from all forms of paludal poison; the climate of Minnesota is stimulating and curative to most chronic diseases of the lungs and air passages, except certain forms of catarrhal diseases of an inflammatory nature.

. . . That these beneficial effects are due largely to influences exerted directly or indirectly upon the functions of nutrition.

. . . That, while the climate of our State, in common with that of all others, has its imperfections, its disadvantages to some classes of invalids, as well as its great advantages to others, an intelligent discrimination should be exercised on the part of the medical profession of the country, and of invalids themselves, concerning who should come and when they should come to Minnesota.

The views of Paterson, expressed in a brief paper which he read to the board of health, were not reassuring to those physicians who unqualifiedly advocated Minnesota as a health resort. In this, his only writing on the subject of Minnesota's climate, he treats the matter with scholarly caution. He does not recommend the climate of Minnesota as a specific for any disease, and upon the subject of "miasmatic diseases" he has nothing to say. After recommending that patients arrive in summer rather than in winter, he states that "diseases affecting the respiratory organs are so various, that much experience and caution, and discrimination are necessary in recommending a climate," and

that "it seems doubtful, whether when the bronchial system is much involved, any good can be effected here. Certainly not in the winter season." It was his belief that the principal benefit derived by a patient in coming to Minnesota is a stimulus to the appetite, induced by changed surroundings, and he concludes with the observation that "what is gained" by a patient "in Minnesota must be used here. If health is restored, the penalty and payment therefor, is permanent residence."

Apparently convinced that the involved questions of climate and health could not be solved without a more thorough knowledge of the facts of climate, the board of health next turned its attention to the collecting and assembling of climatic data. This was done by Doctors Senkler and Leonard, whose data, collected at St. Cloud, Duluth, Minneapolis, Winona, St. Peter, Owatonna, and Stillwater, are reproduced in the *Report* for 1876. Dr. Senkler ambitiously proposed a study of ozone, but the investigation, perhaps fortunately, was never undertaken. At the close of this period the board of health was content, so far as the relation of climate and health was concerned, merely to list vital statistics alongside climatic data, with no attempt to correlate the two sets of data.²⁷

Beginning with the eighties, the duty of telling others about the climate of Minnesota was largely assumed by the board of immigration and by the railroads.²⁸ The acquisi-

²⁷ The manuscript minutes of the Hahnemann Medical Society of Hennepin County for the years 1872-81, in the possession of the Minnesota Historical Society, show the same trend of physicians away from regarding climate as a direct cause of disease and a specific in its cure, and toward a matter-of-fact listing of vital statistics and weather data.

²⁸ Among the publications of the board of immigration is *Minnesota, Her Agricultural Resources, Commercial Advantages, and Manufacturing Capabilities* (St. Paul, 1879). This was also published in French under the title *Le Minnesota, ses ressources agricoles, ses avantages commerciaux et sa capacité manufacturière*. The railroad literature includes *Facts, Fancies and Conclusions about Minnesota*, issued by the St. Paul and Sioux City Railroad (St. Paul, n.d.), and *Where to Recuperate during Summer Days* (Chicago, 1883).

tion of settlers was still a pressing problem, recognized as such by the state and by the railroads. The reason why the latter desired to get settlers on their rights of way is obvious.

This review of the climatography of Minnesota from the fifties to the eighties cannot be brought to a close with the observation that the literature of the eighties shows promise of better things to come. The writings are distinctly mediocre and they do not represent an advance over those which appeared prior to the "climate and health" cycle. The publications of scientists who treated Minnesota's climate as portions of widespread regions were far superior to the local presentations of the state's climatic environment. It is possible that writers were becoming bewildered by the annual accumulation of data which seemed to make a complex thing out of what was supposed to have been very simple, definite, and easy of description. People were brought face to face with certain realities—exceptionally cold winters, droughty summers, the tornado which devastated the St. Cloud region on April 14, 1886. Minnesotans can at least take comfort in the knowledge that before 1891 the signal service and thereafter the United States weather bureau were collecting Minnesota weather data out of which, one day, the true description of the state's climate will be fashioned.

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