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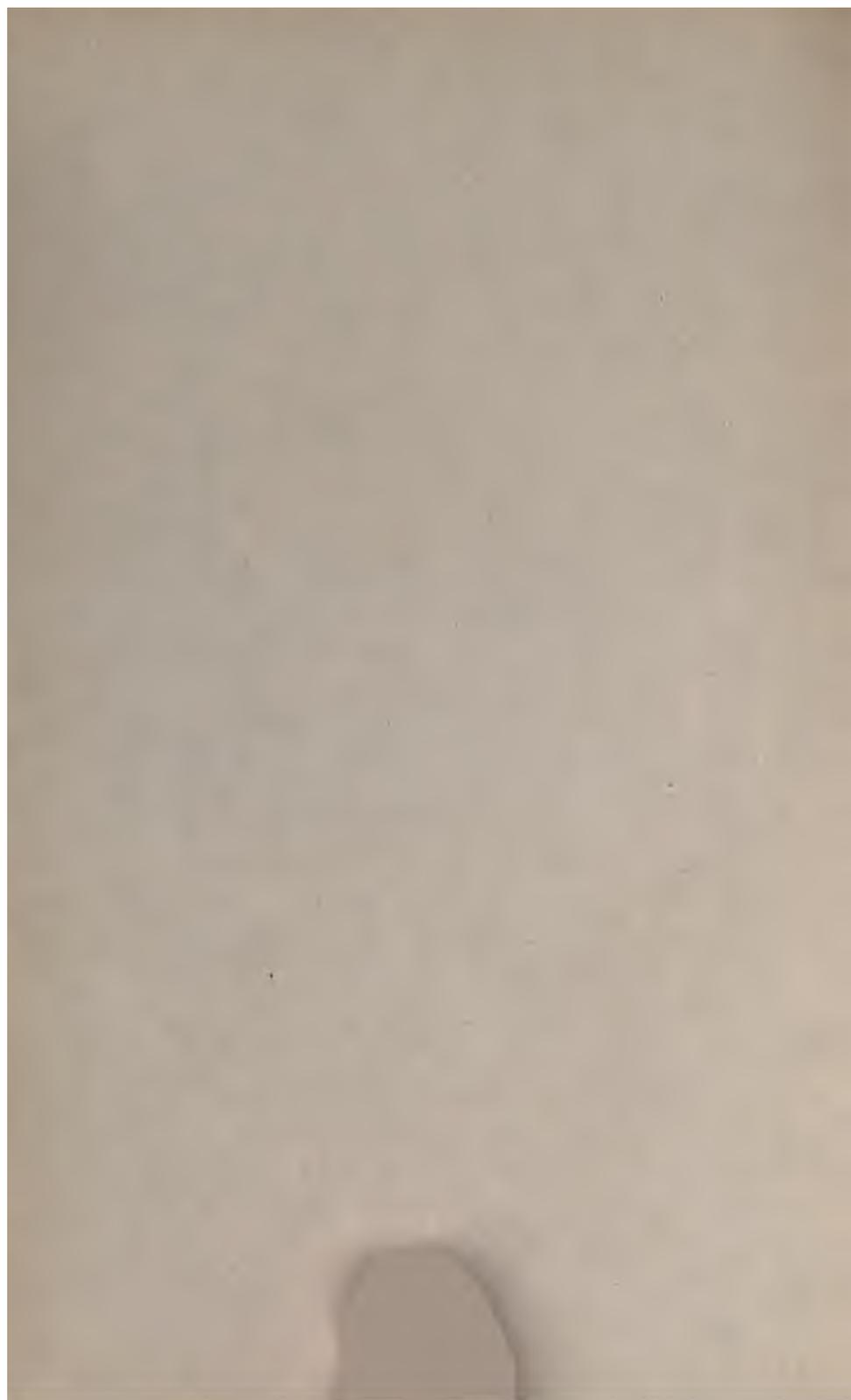
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DEDICATION.

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TO WILLIAM CARSON, M. D.,

Lecturer on Clinical Medicine, to the Good Samaritan and Cincinnati Hospitals.

*THIS LITTLE BROCHURE IS DEDICATED*

IN REMEMBRANCE OF MANY KINDNESSES EXTENDED ME, WHILE  
AN INTERVE AT THE ST. JOHN'S AND GOOD  
SAMARITAN HOSPITALS.

THE AUTHOR.



# ERYSIPELAS AND PUERPERAL FEVER.

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*Including an inquiry into the connections said to exist between Child-bed Fever and Erysipelas; also, a short account of both diseases as they prevailed sporadically in the United States during the "census year, 1870," and an appendix, containing the History of a Puerperal-Fever Epidemic observed in South-western Ohio in the winter of 1872.*

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## INTRODUCTION.

### SECTION I.

"*Si mulieri pregnantī fiat in utero erysipelas, lethale est.*"—HIPPOCRATES.

SYNONYMS.\*—*Erysipelas* (*Greek*); *Febris erysipelatosā* (*Sydenham*); *F. erysipelacea* (*Hoffmann*); *Rosa* (*Lennert*); *die erysipelatose dermatitis* (*German*); *Erysipele* (*French*); *Risipole* (*Italian*).

POPULAR NAMES.—*Ignis sacer* (*Latin*); *die Rose* (*Germany*); *the Rose* (*Scotland*); *Saint Anthony's fire* (*England*); *Black tongue* (*United States*).

*Child-bed Fever*, *Puerperal Fever* (*England*); *Fievre Puerperale* (*France*); *Febbre Puerperale* (*Italy*); *Fiebre Puerperale* (*Spain*); *Kindbett fieber* (*Germany*); *Febris Puerparum* (*Latin*).

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\* Compiled mostly from Reynolds, Robin & Littre, and Dunglison.

Some months since, a discussion occurred at the Cincinnati Academy of Medicine, in regard to the propriety of a physician's attending a confinement case, who might have been in recent attendance upon patients suffering from erysipelas. The differences of opinion among those present, on that occasion, induced the writer to look up the subject a little, on his own account, in order to obtain further enlightenment. In doing this, it became necessary to overhaul certain books, among which were the volume on "Vital Statistics of the United States,"\* and the "Health Reports" of various cities. From these were compiled various tables, at an infinite amount of trouble. These tables were then analyzed and various deductions drawn therefrom, some of which confirmed various ideas emitted heretofore in regard to erysipelas and puerperal fever; others contradicted conclusions arrived at by various authors: as thus, for instance, confirming Dr. Drake's opinion that erysipelas, in the United States, was not confined to any particular geographical section, subject to no particular climatic influences, and that the disease was most prevalent in winter and spring; while Duges,† who as early as 1828 spoke of the prevalence of puerperal peritonitis in certain months (*i. e.*, January, February, October, and November), finds a partial support for his statement. On the contrary, the positive statements of Chomel, Blache, and numerous other writers, that erysipelas is more prevalent among women than among men, finds here a point-blank contradiction.

The principal objective point, however, was the study of the connection which is said to exist between puerperal fever and erysipelas. In the feeble attempt I have made to elucidate this problem, much that was curious and new, as far as regards the two diseases in "the States," was revealed; and if I was not successful in clearing up the mystery which enwraps the subject, I have at least partially satisfied a natural curiosity and become impressed with certain crude ideas. A local epidemic of puerperal fever in this city, was the first food I had for reflection. This was digested as carefully as possible, and the results noted and arranged. Next, a table of mortality from erysipelas and puerperal fever, in each state of the "Union," was compiled from the mass of figures given in the ninth census. From various sources, principally "Government Reports" and Blodget's magnificent

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\* Ninth Census, Volume II, Washington, 1872.

† Memoirelu a l'Academie Royal de Med., October, 1828.

work on Climatology, the variation of temperature and rain-fall in the different states has been noted; then a rough attempt has been made at giving the astronomical climactic boundaries of various sections, with the character of the country, sectional topography, etc., in the hope of throwing some light on the subject. In this latter attempt I have been most signally unsuccessful, and, in the *amateur* role of "Medical Geographer," "*his first appearance on any stage,*" I am doubly open to criticism. Nevertheless, in the hope of adding my mite to the general fund, I may apologize for a mass of dry and uninteresting statistics here offered, excusing myself in the words of Paulus Ægineta: "*Non quod de novo quid addere aut á veteribus prætermisum sed propriæ exercitationis causâ.*"

A rough, historical outline of both diseases will be first given, after which the opinions of various authors, in regard to the connection of the two diseases and their contagious properties, followed by a study of the two diseases as they prevailed in the different States in the "census year," ending June 1, 1870; and last of all, a study of both diseases as they have appeared in Hamilton county, for the past eight years, including the local epidemic of 1872.

*Historical.*—That puerperal fever was not unknown to the ancients, is a matter of fact; for in its sporadic form it has been described by Galen, Hippocrates, Avicenna, and others. Hulme\* quotes extracts from Hippocrates, Galen, and Ætius to prove this point. He also refers to "Plater (1602), Lennert (1656), Riverius (1674), Sylvius (1674), Willis (1682)." Churchill refers to Raynaldes' Translations of Eucharius Rhodion; also to the Child Bearer's Cabinet (1653), Strother (1718), Cooper (1725), Sydenham (1726), Boerhaave (1737), Hoffman (1734)." Strother, according to Hulme, first gave the name, *Puerperal Fever*, to the disease. Dr. Francis Adams,† in his translation of Hippocrates, refers in an editorial foot-note to the case of "Thasus, wife of Philinus" (Case IV), as being a well-marked case of puerperal fever. The curious reader is referred to him for a fuller account. The number of references might be multiplied, but let these suffice for the present, to convince us that sporadic puerperal fever was not altogether unknown to the older writers. References to sporadic erysipelas

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\*A Treatise on Puerperal Fever, Nathaniel Hulme, M. D., London, 1772; Churchill, Collection of Essays, Sydenham Society, London, 1849.

† Epidemics, Book I, page 373. London, 1849.

are abundant in almost all ancient works. Drs. Churchill\* and Meigs† give almost complete lists of the puerperal fever epidemics of the past; and in glancing over their elaborate tables, we see that in *France* there were epidemics in 1664, 1746, 1750, 1774, 1775, 1780, 1781, 1782, 1786, 1816, 1818, 1819, 1820, 1830, 1834, 1838, 1843, 1844, 1845, 1846. These various epidemics were mostly in Paris, Rouen, Lyons, Rennes, and Gratz. In *England* there were epidemics in 1760, 1761, 1765, 1769, 1770, 1771, 1780, 1783, 1787, 1788, 1808, 1812, 1813, 1814, 1820, 1824, 1825, 1827, 1828, 1829, 1835, 1836, 1838, 1842. These various epidemics occurred in London and Birmingham, and in Derbyshire, Durham, Northumberland, Somersetshire, and various other sections. In *Ireland*, 1764, 1767, 1774, 1787, 1788, 1803, 1805, 1810, 1811, 1812, 1813, 1818, 1819, 1820, 1823, 1826, 1828, 1829, 1836, 1837, 1845. These epidemics were mostly in the city of Dublin. In *Scotland*, 1760, 1761, 1773, 1789, 1790, 1791, 1792, 1809, 1810, 1812, 1815, 1821, 1822. These epidemics occurred in Edinburg, Glasgow, Leeds, Aberdeen, and Stirling. In *Sweden*, Stockholm, 1838. In *Denmark*, Copenhagen, 1672, 1792. In *Prussia*, 1652, 1723, 1811, 1819, 1823, 1826, 1827. These epidemics occurred at Leipsic, Frankfort, Heidelberg, Hanover, and Berlin. In *Austria*, 1770, 1776, 1818, 1823, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843. These epidemics mostly occurred at Vienna. In *Bavaria*, 1815, 1818. These epidemics were confined mostly to Munich, Wurtzburg, and Bamberg. Other portions of "the continent" have suffered, but I think this will suffice to show that the temperate and northern latitudes of Europe have had their share of epidemics; and for further information the reader is referred to the sources from whence these dates were principally compiled (*loc cit.*) Epidemics of erysipelas might be added, as they have occurred, off and on, for "lo, these many ages." These are of no use to us, however, so long as they refer to the disease alone; it is only when we find references of its connection with puerperal fever that the matter becomes interesting, and it has been comparatively few years since the same was noticed. Gordon,‡ in his essay on Puerperal Fever (London, 1795), gives Peauteau credit for having emitted this idea, forty years previously (1755); also to Clark, of London, in 1788. Trousseau

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\* *Loc cit.*, page 31.

† *Obstetrics: The Science and the Art*. Philadelphia, 1863, page 608, *et seq.*

‡ *Gordon: Meigs' Collection of Essays*. Philadelphia, 1842.

gives Graves, of Dublin, credit for the same. In these differing statements we have no particular interest. In 1849, Masson studied this subject especially. Unfortunately, I have been unable to obtain his book; a table of his, however, which I find copied into the "*Nouveau Dictionnaire de Medecine*," gives some idea of the two diseases as they prevailed together at various years in Paris hospitals.

ERYSIPELAS.	PUERPERAL FEVER.
November, 1829, to January, 1830	January to May, 1830.
September and December, 1830.	December, 1830, to March, 1831.
August, September, October, 1831	July to August, 1831.
December, 1832, to January, 1833	January to April, 1833.
August, September, October, November, and December, 1833.	July, August, October, November, and December, 1833.
June, 1833.	February to May, 1833.
May, 1837.	November, 1836, to May, 1837.
October, November, and December, 1838.	October, 1838, to February, 1839.
August, September, October, 1840	July, 1840, to April, 1841.
September to October, 1842.	July, 1842, to March, 1843.
Six first months of 1844.	Six first months of 1844.
Six first months of 1845.	September, 1844, to September, 1845.
Three first months of 1846.	December, 1845, to May, 1846.

The coincidence of time in the prevalence of these two diseases, will be here noticed. Other "continental" statistics might be quoted, if it were necessary. Let us now turn to the epidemics of our own country. Epidemic erysipelas, according to our own great Drake,\* was first noticed in 1826: "An erysipelatous invasion commenced in the northern part of New Hampshire, north latitude 45°, in the year 1841, and made its way down the valley of the Connecticut river, and that it prevailed in various places east of the mountains, from that in which it originated, to the southern part of Virginia, which it reached in the winter of 1844-'45." From Dr. Drake's table of epidemics, we notice, then, that the disease had appeared in epidemic form, up to 1849, in the following localities, at the subjoined dates: Burlington, Vermont, 1826; Ogdensburg, New York, 1822; Middleburg, Vermont, 1841-42;

\*Daniel Drake, M. D. "A Systematic Treatise—Historical, Etiological, and Practical—on the Principal Diseases of the Interior Valley of North America. Philadelphia, 1854. Book II, section 2, page 622, *et seq.*

Crown Point, New York, 1841-2; St. Albans and St. Johnsbury, Vermont, 1842; Ripley county, Indiana, 1842; St. Charles, New Madrid, and Boonville, Missouri, 1842-3; Erie county, New York, 1843; Milwaukee, Wisconsin, 1843-4; Western New York, 1843-4; Michigan City, Indiana, 1843-4; Bloomington, Illinois, 1843-4; Louisville Hospital, Kentucky, 1843-4; Memphis, Tennessee, 1843-4; Big Black Valley, Jackson, Vicksburg, and Warrenton, Mississippi, 1843-4; Genesee, Wyoming, and Alleghany counties, New York, 1843-4; Grand Gulf and Port Gibson, Mississippi, 1844; Whitesburg, Alabama, 1844; Columbia, Tennessee, 1844; Lima, Livingston county, New York, 1844; Courtland, Alabama, 1845; Ontario county, New York, 1845; Uniontown and Laurel Mount, Pennsylvania, 1845-6; Livingston county, Michigan, 1847; Vicksburg, Mississippi, 1848-9; New Orleans (Charity Hospital), Louisiana, 1848-9. In the State of Ohio, at St. Clairsville, 1833; Preble county, 1836; Miami Valley, 1842-3; Meigs county, 1845-6; Brown county, 1848-9.

Dr. Drake says: "In reference to climate as modifying the violence of the disease, it had no influence; for, as we shall hereafter see, the disease was equally violent in the latitudes of 45°, 39°, and 32°; that is, on the banks of Lake Champlain, the Ohio, and the Lower Mississippi." Other writers, besides Dr. Drake, have given partial histories of the epidemic. In a well-written monograph,\* Dr. John Dawson, of Jamestown, Ohio, gives "an account of Epidemic Erysipelas," as it prevailed in some parts of Ohio.

This was the epidemic of 1842-3, and the doctor gives a full account of the disease, as it prevailed in Greene county, at that time; also referring to the epidemic in the "Pennsylvania Hospital" (Philadelphia), in 1830. Dr. Dawson says: "During the winter and spring of 1844, the disease assumed the form of an epidemic in the Miami Valley. At first it was most severely felt in the vicinity of the larger streams of water. On each side of the Miamis, and along some of their tributaries, it made its first appearance, showing, as it were, a preference for malarious districts." Dr. Dawson's most valuable observations, at that time, however, were as to the connection existing between the epidemic erysipelas and the puerperal fever, which was then very prevalent in Warren and Montgomery counties (Dayton and Centreville). The doctor gives quite a number of cases to the point, and is fairly entitled to the credit of having been the closest observer and student of the

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\*Western Journal of Medicine and Surgery, Louisville, 1845.

connection of the two diseases, in that celebrated epidemic. Dawson's conclusions are then entitled to due weight. They are as follows :

"1. That the disease prevailed at the same time that erysipelas was prevailing, and subsided on the disappearance of that malady.

"2. That the premonitory symptoms were like those of erysipelas, consisting of a chill, followed by more or less fever and sore throat.

"3. That in several instances, erysipelas made its appearance on the skin during the progress of the malady, as was the case with several families witnessed by Dr. Van Tuyl, and others.

"4. Instances occurred in which erysipelas was contracted from puerperal females by their nurses.

"5. That the children delivered, in almost every instance, were taken shortly after birth with high fever, erysipelas of the scalp and face, and died."

Dr. Dawson finishes by saying: "Facts of this character must be regarded as going to settle, in a tolerably decided manner, the position that the fatal disease which occurred to the puerperal females, to whom I have alluded, is identical with the epidemic erysipelas, which prevailed at the time in the neighborhood."

Among various army reports, we also find the following: "Dr. Augustus Viele, Watervliet Arsenal, reports" (June, 1841), "many cases of erysipelas have occurred in the vicinity of this post during the past quarter; also many cases of puerperal fever, nearly all of which proved fatal." In March, 1842, Assistant Surgeon L. C. McPhail, at Plattsburg Barracks, reports the prevalence of an epidemic erysipelas of a very fatal character, in the north-west part of Vermont, along the New York border and in the counties of the latter state bordering on Lake Champlain." The same officer, in another report (1843), says: "The epidemic erysipelas, noticed in my report, March, 1842, has continued in these parts to the present, and deaths from it are of almost daily occurrence," etc., "and parturient women have fallen, in unusual numbers, victims to puerperal fever."\* Probably other persons noticed the connection between the two diseases at that time. My only idea is to put on record the fact, that they were both noticed prevailing as epidemics at the same period. Epidemics of puerperal fever occurring in the United States, and noted by Meigs and Churchill,

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\* Report on the Sickness and Mortality among the Troops in the Northern Division. R. H. Coolidge, U. S. A.

are as follows: Northumberland, Pennsylvania, 1814, and in the State of Pennsylvania, 1817, 1818, 1833, 1842. Since 1850 many local epidemics in the different sections of the "States," have undoubtedly occurred, but it is not the writer's intention to give a history of American epidemics. Thinking the outline sketch we have given, will be sufficient for all practical purposes, let us now turn to the question of the contagion of both diseases. What is contagion? I think one of the handsomest and clearest definitions of the word *contagion* is that given by Gallard;\* it is an embodied epitome of all ancient definitions. Says Gallard: "Contagion is the act by which a determined disease communicates itself from an individual, who is affected by it, to a healthy individual, by means of a contact either immediate or mediate." Having heard the definition, let us now turn to the question of contagion, confining ourselves to the views enunciated since the beginning of the present century, by various authors. Says Gordon:† "The analogy of the puerperal fever with erysipelas will explain why it always seizes women after and not before delivery; for, at the time erysipelas was epidemic, almost every person admitted into the hospital of this place with a wound, was, soon after his admission, seized with erysipelas in the vicinity of the wound. The same consequences followed the operations of surgery; and the cause is obvious: for the *infectious matter* which produces erysipelas was, at that time, readily absorbed by the lymphatics, which were then open to receive it.

Just so with respect to puerperal fever: women escape it until after delivery; for until that time there is no inlet open to receive the *infectious matter which produces the disease*. But after delivery the matter is readily and copiously admitted by the numerous patulous orifices, which are open to imbibe it, by the separation of the placenta from the uterus." The following from Hulme,‡ who wrote a treatise some twenty-five years before Gordon, shows the change of opinion in that short space of time. Says Hulme: "Miliary fevers, and others of the like kind, are reckoned very common to lying-in women. Yet I am persuaded, from manifold experience, that *these fevers are more the offspring of a heated room and warm regimen*, than of anything peculiar to the state of child-

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\* Article Contagion, Dict. de Med. et de Chirurgie, Tome IX, p. 210, *et seq.*

† A Treatise on the Epidemic Puerperal Fever of Aberdeen. London, 1795.

‡ A Treatise on Puerperal Fever. Hulme. London, 1772.

bed women. I have attended more than fourteen hundred women, after their deliveries, in the City of London Lying-in Hospital, yet I do not remember ever meeting with an instance of miliary fever in that house," etc.; and he adds, "I have never observed in that excellent asylum for pregnancy, any petechiæ, vibices, *exanthemata*, vesiculæ puncticula, or any other febrile eruptions, joined with the fever of which we are now treating." From this it will be seen that Hulme was not a believer in contagion. Dr. Leake,\* who published an article this same year, 1772, seems in doubt as to whether it is contagious or not, for he says: "Thus, for instance, it will always be found most fatal when most epidemical; that is, during a distemperature of the air, and least of all so, when it happens in *healthy seasons from accidental causes only*." Churchill and Meigs, who have each compiled essays on Puerperal Fever, of the older English authors, give their papers in full, and Churchill (page 38) says: "A very important question, that of contagion, remains. The opinions of those most experienced, vary very much. Drs. Hulme, Hey, Armstrong, Dewees, and Campbell, in their works, deny its contagiousness. Dr. Gordon, Prof. Young, Mr. Ceely, Drs. Ramsbotham, Rigby, Lee, and Copland, etc., affirm it. Dr. Hamilton thinks it so contagious that it may be communicated by a third person. Dr. Copland thinks it decidedly contagious, and has accumulated a great amount of evidence." Says Thomas Denman: † "It having been long suspected, and being now fully proved, that they may be and often have been conveyed by midwives or nurses from one patient to another;" and in the "Principles of Medicine," ‡ we read: "In hospitals it has conspicuously appeared as a contagious disease. There has been much dispute whether the contagion is one *sui generis*, or that of typhus, erysipelas, or hospital gangrene; or if the disease depended on some noxious state of the atmosphere, conjoined with the absorption of putrid matter." Dr. Labatt, who published an account of the Dublin epidemic of 1819-20, thought that the typhus fever was the cause of it. C. H. F. Routh, in a communication to the "Medico-Chirurgical Transactions," § in referring to the Vienna epidemic says, "That the contact of *fomites*, the direct or indirect commu-

\* Practical Observations for Child-bed Fever. London, 1772.

† An Introduction to the Practice of Midwifery. By Thomas Denman. London, 1805, Vol. II, p. 507.

‡ Principles of Medicine. London, 1820, p. 533.

§ Medico-Chirurgical Transactions, Vol. XXXII, p. 27, *et seq.* London, 1849.

nication with persons affected with puerperal fever; that some influences, carried either by the patient herself, or by her attendants, from other contagious diseases, such as erysipelas, typhus, and other low fevers, has in many cases given rise to puerperal fever among lying-in patients, is a fact that admits of no doubt." Says Blundell:\* "It is much disputed by some, whether this disease is infectious; but, however this point may be decided, or unsettled, the facts affirmative of infection are so strong, that accordingly it becomes our duty to act." Blackman, of Edinburg, was the first who believed the disease was directly communicated by a poison introduced by the physicians or attendant, "*subter unguis*," during the *per vaginam* examinations. Says Sir James Simpson:† "I shall content myself by observing here (what I have taught elsewhere for the last ten years), that there exists, I believe on record, a series of facts amply sufficient to prove this, at least, that patients during labor have been and may be locally inoculated with a *materies morbi* capable of exciting puerperal fever; that this *materies morbi* is liable to be inoculated into the dilated and abraded lining membrane of the maternal passages during delivery, by the fingers of the attendant; that thus in transferring it from one patient to another, the fingers of the attendant act, as it were, like the ivory points used by some of the early vaccinators."

Under the name of peritoneal fever, Gooch‡ speaks of infection thus: "Facts, such as these, have long led to the suspicion that the disease might be communicated from one lying-in woman to another, in the clothes of the practitioner or nurse, or the furniture of a tainted chamber." In speaking of child-bed fever and its contagion, Meigs§ remarks (as late as 1862); "I have carefully read the cases, considered the arguments, and witnessed many of the events upon which so confident a belief of the contagion is founded, and I aver that I do not discover in them any force, that ought to convince me of the contagious nature of the disorder; wherefore I utterly reject and deny the doctrine as one injurious to the profession of medicine, pernicious to the people, by filling the minds of interested parties with alarm, and as propagating, from age to

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\* Blundell. *The Principles and Practice of Obstetrics*. Washington, 1834, p. 473.

† *The Obstetric Memoirs and Contributions of James Y. Simpson, M. D.* Edited by Priestly and Storer. Philadelphia, 1856, Vol. II, p. 31.

‡ Gooch. *Diseases Peculiar to Women*. Philadelphia, 1836, p. 20.

§ Meigs' *System of Obstetrics*. Philadelphia, 1863, p. 614, *et s. q.*

age, a vile, demoralizing superstition as to the nature and causes of many diseases." This is the very strong language used by one whose first rank as an obstetrician in the "States," entitled his opinions to due respect. In speaking of "Hospital Hygiene," the "medical officer of the Privy Council"\* says: "Asurgeon going to a puerperal woman from attendance on a case of erysipelas, may convey the specific contagion to the uterine surface of his new patient, and occasion her death by that form of puerperal fever, which, under a special name, is in fact but intro-abdominal erysipelas." Says Woods:† "It is indeed not an uncommon opinion, especially in Europe, that puerperal fever and erysipelas, occurring epidemically, are interchangeable diseases, the one being able to produce the other by personal communication. But neither in public nor private practice, have I ever seen a case of erysipelas in which there appeared to be any proof of a contagious origin; nor do I believe, as it ordinarily occurs, it is in the least contagious." But he adds, as if to still more throw doubt on his position, "Subsequent experience of other physicians tended to confirm this view of the interchangeable character of these affections occurring epidemically." Says the celebrated Bedford:‡ "The testimony is ample, showing a connection between puerperal fever and erysipelas. The two diseases may prevail simultaneously, in the same neighborhood; or, if erysipelas alone prevail, a third party may communicate, from a patient affected with it, puerperal fever to a woman recently delivered." In yet another place (p. 683), Bedford remarks: "I do not deem it necessary to cite particular examples, in which puerperal fever has been conveyed through the principle of contagion. They are so numerous, and so free from all doubt—in a word, they are so conclusive—that I can not conceive how they can be regarded otherwise than completely demonstrative of the point at issue." Says Aitken:§ "Erysipelas and puerperal fever are interchangeable diseases, the one being able to induce the other by personal contact." And again he says, in yet another place (p. 361): "The spread of erysipelas has been

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\* Sixth Report. London, 1864, p. 59.

† Woods. A Treatise on the Practice of Medicine. Fifth edition. Philadelphia, 1858, p. 446.

‡ Bedford. The Principles and Practice of Obstetrics. New York, 1863, p. 683, *et seq.*

§ The Science and Practice of Medicine. London, 1866, Vol. I, p. 362.

so frequently observed, both in the sick room and the wards of hospitals, that no doubt can exist of this disease being communicable by impalpable emanations." Says Trousseau,\* the prince of French clinical lecturers, speaking of erysipelas: "Those of you who have followed the surgical *service*, know that while during a certain time—one year, eighteen months, two years—it is rare to see this affection coming on after the most serious operation; at other times, as I in a moment will call to your recollection, the surgeon can not cut the least with the bistoury without exposing his patient to this complication. This is the state of affairs now. At the same time a most serious epidemic of puerperal fever has prevailed for a long time at the '*Maternite*,' where sixty patients have died in the space of ten months." Reynolds,† speaking of puerperal fever, remarks: "Sporadic cases, from time to time occur, without the diffusion of the disease; but even then it is right to observe the utmost caution, as so much doubt is always involved with regard to its contagious nature." Say Littre and Robin, in the last edition of their elaborate dictionary:‡ "It is proved to-day that sporadic, as well as epidemic erysipelas, is contagious." Says Watson,§ who believed idiopathic erysipelas to be contagious: "The causes of erysipelas are various, and often obscure. I have stated that it is communicable, by contagion, from person to person; yet this contagious property is so feebly marked that it is denied by many." Reynolds (*loc cit.*), speaking of erysipelas, remarks: "But by far the most important cause, acting from without, is the *poison*, whatever may be its nature, which exists in one case and can be communicated to another, either by inoculation, simple contact, transmission through the air, or by fomites." Simpson,|| one of the earliest believers in the interchangeable character of the two diseases, in a late work, speaking of contagion, remarks, as late as last year (1872): "The obstetric physicians of Great Britain generally agree, I believe, as to the occasional spread of puerperal fever in this mode, from the affected to the healthy, by the unhappy and indirect medium of the physician, nurse, etc., as well as

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\* Clinique Medicale. Deuxieme edition. Paris, 1865, Vol. I, p. 166.

† A System of Medicine. J. Russell Reynolds. London, 1871, Vol. III, p. 222, *et seq.*

‡ Dictionnaire de Medicine. Paris, 1865, p. 548.

§ Watson. Principles and Practice of Physic. Philadelphia, 1853.

|| Simpson "On Hospitalism." New York, 1872, Vol. II, p. 382.

by contagious miasmata." The views of numerous authors might be quoted at length, regarding the contagion of the two diseases, some *pro*, others *con*, as regards this special point; let the few well-known names quoted, however, suffice. In regard to the particular questions of the interchangeable character of the two diseases, a few additional *notes* might not be inappropriate. It is Virchow, if I be not mistaken, who asks: "Can erysipelas be puerperal fever?" and sees a close connection between the two diseases, so much so, indeed, as to designate puerperal fever as nothing less than an "*Erysipelas malignum internum*." The experiment made by Hardy, in the Paris hospitals, during an epidemic of puerperal fever, are so well known that it would be useless almost to quote it at length; in brief, however, it was as follows: Hardy transferred all his lying-in patients, "with the exception of six too sick to remove," to wards just vacated by patients suffering from diseases of the skin. What was the result? Puerperal fever entirely ceased; not another woman was attacked; while thirty-two of the skin-disease patients, who had been transferred to the wards *formerly occupied* by the puerperal fever patients, were *attacked by erysipelas*, one of them dying. During epidemics in Paris hospitals, well-authenticated cases are on record, where house-doctors and nurses, attending women suffering from puerperal fever, have in turn been attacked by erysipelas. Numerous cases of this kind are to be found recorded in the journals of all countries. These coincidences in the occurrence of two diseases at the same time should not, however, be regarded as making an absolute rule. Measles sometimes attacks a person laboring from scarlatina, and the latter again may be complicated by diphtheria. They all three prevail epidemically at the same time, and are equally contagious. Each disease may exist by itself and display its usual type, or it may be complicated by the addition of one of the others. It has been proven beyond a doubt, that erysipelas and puerperal fever prevail epidemically at the same time; and when we read in journals that cases of puerperal fever have died, whose skins were erysipelatous at points, we have no right to make the deduction that the diseases are one and the same, any more than we have the right to say that measles and scarlatina, when co-existent, is nothing but scarlatina. But it was not my intention to digress: "*revenons à nos moutons*." Says Collins,\* speaking of puerperal fever, "This disease has also become

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\* Robert Collins. Obstetrics. American edition. Boston, 1841, p. 228.

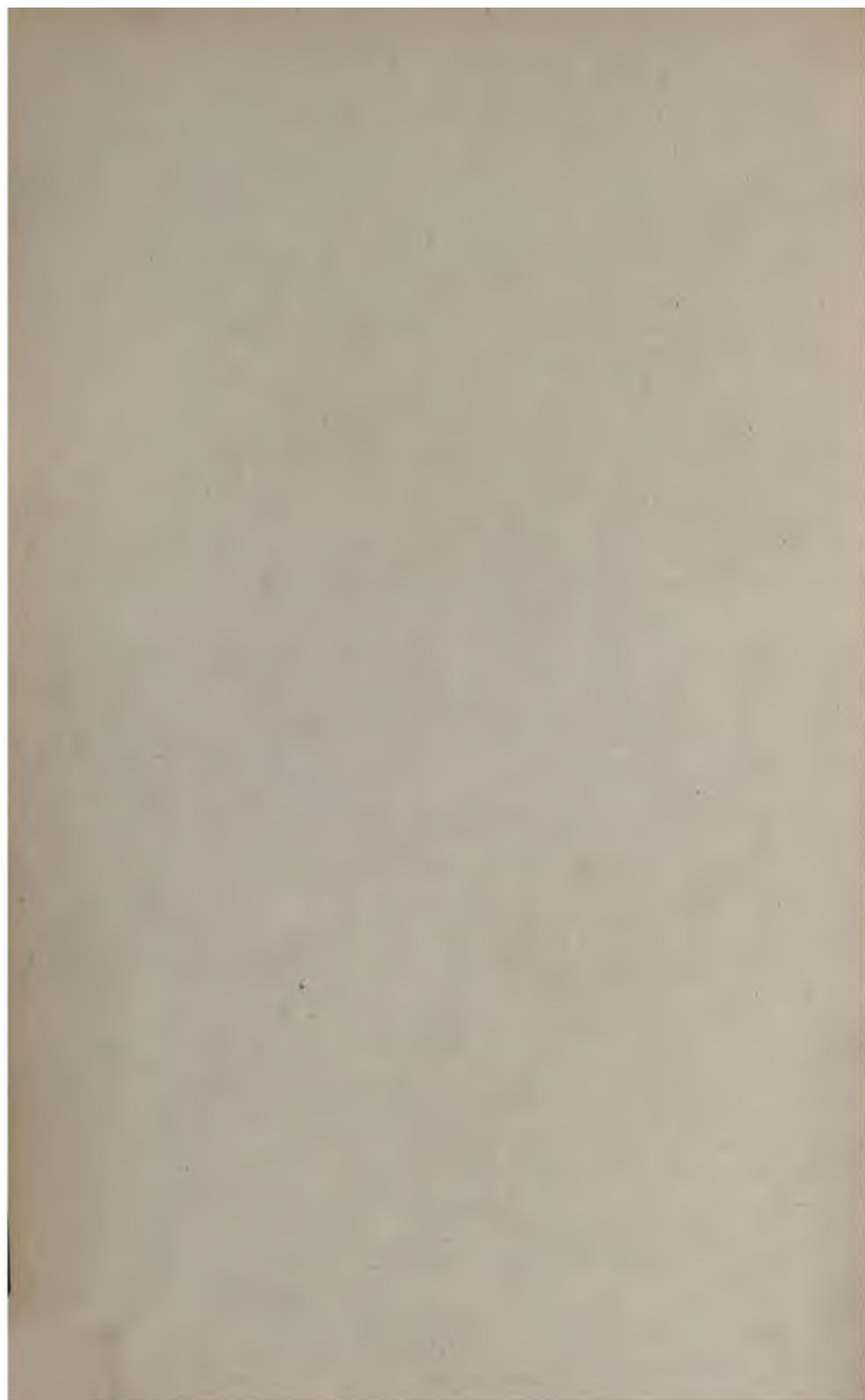




Table showing the Mortality

FIRST SECTION. NEW ENGLAND STATES.	Population in 1870.	Deaths from Erysipelas in 1870.		Total number males and females.	Deaths from Puerperal fever.	Total Mortality from both diseases.	SPRING.						REMA				
		M.	F.				March.			April.				May.		June.	
							Erysip.	Puerp. F.	Erysip.	Puerp. F.	Erysip.	Puerp. F.		Erysip.	Puerp. F.	Erysip.	Puerp. F.
MAINE .....	626,915	30	17	47	8	55	2	1	8	3	3	0	5	0			
NEW HAMPSHIRE .....	318,300	14	14	28	6	34	6	1	2	1	2	0	2	0			
VERMONT.....	330,551	10	12	22	5	27	2	1	4	0	3	0	0	0			
MASSACHUSETTS .....	1,457,351	84	66	150	51	201	12	4	14	3	11	7	17	2			
RHODE ISLAND.....	217,353	9	12	21	1	22	2	0	2	0	1	0	0	0			
CONNECTICUT .....	537,454	20	18	38	15	53	7	0	4	2	7	5	2	0			
TOTAL.....		167	139	306	86	392	31	7	34	9	27	12	26	2	1		
SECONDSECTION. MIDDLE STATES.																	
NEW YORK.....	4,382,759	253	202	455	235	690	61	38	56	29	48	22	45	18	20		
NEW JERSEY.....	906,096	31	31	62	9	71	10	0	4	1	8	1	3	1	4		
PENNSYLVANIA.....	3,521,951	154	128	282	108	390	23	14	34	13	26	17	25	7	10		
DELAWARE.....	125,015	6	6	12	1	13	0	1	1	0	0	0	0	0	0		
TOTAL.....		444	367	811	353	1164	94	53	95	43	82	40	73	26	40		
THIRD SECTION. SOUTHERN STATES.																	
MARYLAND.....	780,894	29	34	63	19	82	6	2	10	5	6	1	3	0	5		
VIRGINIA.....	1,225,163	34	39	73	60	142	7	10	8	6	9	12	4	6	3		
NORTH CAROLINA.....	1,071,361	24	28	52	52	104	4	1	4	2	6	5	5	1	3		
SOUTH CAROLINA.....	765,606	11	10	21	15	36	3	3	0	3	4	2	1	0	1		
GEORGIA.....	1,184,109	12	26	38	76	114	5	12	2	13	5	9	5	2	1		
FLORIDA.....	187,748	5	4	9	5	14	0	1	0	0	1	0	0	0	2		
ALABAMA.....	996,992	30	21	51	53	104	7	6	4	6	6	7	4	2	3		
MISSISSIPPI.....	827,922	20	16	36	45	81	2	5	5	8	7	9	0	1	2		
LOUISIANA.....	726,915	21	31	52	24	76	2	4	5	3	8	2	2	1	1		
TEXAS.....	818,579	47	44	91	86	177	9	5	6	11	6	9	9	4	6		
DISTRICT COLUMBIA.....	131,760	6	7	13	6	19	3	0	1	0	0	0	1	0	1		
TOTAL.....		239	260	499	450	949	48	49	45	57	58	56	34	17	28		

and analyze the following table of figures, which, as has been before remarked, were compiled from the last census. Commencing, then, with the New England States, as follows :

*Maine.*—Extending itself from the forty-third to the forty-seventh parallel of latitude, the State of Maine stretches eastward into the Atlantic to the neighborhood of longitude 67 west, and westward to longitude 71 west. Glancing over a hypsometric map of the state, we find that its elevation above the level of the sea, from east to west, gradually increases: along the coast being from the sea level to 400 feet above; then a narrow central plateau varying from 400 to 800 feet, and then a far western range of land having an elevation of from 800 to 2,000 feet. Portland, in latitude 43.40°, longitude 70.14°, has a mean annual temperature, according to Blodget,\* of 42.9°, as was ascertained from observations, extending over a series of years, which were taken at the Portland Marine Observatory. In mean monthly figures the temperature reads as follows: January, 19.6°; February, 21.2°; March, 30°; April, 40.2°; May, 50.2°; June, 59.5°; July, 66.1°; August, 64.6°; September, 57.5°; October, 46.1°; November, 35.4°; December, 24.1°. This would give then a mean spring temperature of 40.1°; summer, 63.4°; autumn, 46.3°; winter, 21.6°.

The mean *monthly* fall of rain and melted snow might be given, but I shall content myself by only using the annual quarterly reports from certain points that I have selected; thus, Fort Kent, in the northern part of the state; Fort Sullivan, a more central point, and Fort Preble, in the southern part of the state, read as follows :

	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Kent,	5.46 in.	11.65 in.	9.64 in.	9.71 in.	36.46 in.
Fort Sullivan,	8.88 in.	10.05 in.	9.85 in.	10.61 in.	39.39 in.
Fort Preble,	12.11 in.	10.28 in.	11.93 in.	10.93 in.	45.25 in.

It will be seen at a glance that the well-known rule of a diminished rain-fall, the further the distance from the equator, is fully exemplified here. The northern and interior part of Maine is covered with a dense forest of hard woods, consisting of different varieties of maples, beech, birch, and ash, on the higher lands, and spruce, fir, cypress, and larch, on the lower lands; white and yellow pine forests abound in isolated groups. At Fort Kent, latitude 47.15° north, longitude 68.38° west, the most northern interior

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\* *Climatology of the United States.* Lorin Blodget. Philadelphia, 1857.

point of observation in the state, the mean annual temperature is about 35.90°. Winter commences in October, and the St. Johns river is usually frozen by the 30th of November. During the winter the thermometer often falls below zero, providing the nights are clear; the mercury often freezing in the bulb during the month of January. The snow generally disappears from the open lands about April, but in the woods is often found as late as the first of June. The first swallows are seen in May. The population is made up mostly of the French stock, the descendants of the settlers of 1783, the Acadians, who were exiled from Nova Scotia by the English, a people whom Longfellow has so charmingly idealized in his poem of *Evangaline*. The country about Fort Kent is one of the healthiest in the United States, according to Dr. Weatherspoon.\* At Fort Fairfield, one degree of latitude further south (*i. e.* 46.46°), "the transition from winter to summer is very rapid; the trees put forth their leaves and the wild flowers bloom, while masses of snow remain in the forest; field strawberries ripen the first of July." (Dr. R. H. Coolidge, U. S. A.) At Hancock Barracks, situated a short distance further south, the average mean annual temperature is about 40.15°. The mean annual temperature of Portland, in the extreme southern portion of the state, has been previously given; the northern isothermal line of 44° crosses Maine in the neighborhood of that city. From the statements made, it will be seen that the State of Maine has a very late spring and an early winter.

*Study of the Table.*—It will be seen that 47 persons died of erysipelas, in Maine, in 1870, out of a total population of 626,915, and that during the same time there were only eight deaths from puerperal fever. The deaths from erysipelas among men were over 40 per cent. greater than among women; that is, 30 males to 17 females. The decedents from erysipelas were all white, and native born, with but one exception. The decedents from puerperal fever were all whites, 75 per cent. being native, and 25 per cent. foreign born. The seasons of greatest mortality from erysipelas were those of spring and winter; the season of greatest mortality from puerperal fever was spring. The month of greatest mortality from erysipelas was April, when there were 8 deaths; the month of greatest mortality from puerperal fever was *April*, when there were 3 deaths.

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\* Report in "Medical Statistics U. S. Army." Washington, 1856, p. 22, *et seq.*

*Reflections.*—It is evident that these cases of puerperal fever must have been sporadic, and that the coincidence of time between the greatest mortality from erysipelas and puerperal fever has no significance. This is the conclusion we must inevitably arrive at, in the absence of exact histories of the eight cases of fever. We see, however, that in the State of Maine the native-born population suffer most from both diseases, and that winter and spring, with a *low temperature*, are most favorable to the development of both diseases. I can find no record of epidemics of either malady, in the absence of suitable books of reference in relation to the prevailing diseases of Maine.

NEW HAMPSHIRE.—With its eastern borders touching Maine at longitude about 71° west, and its western borders a little over 72° longitude west, New Hampshire stretches its length from the 43d to the 45th parallel of latitude. Most of the state has an altitude of from 800 to 2,000 feet above the sea level, it being embraced in part of the Appalachian range of mountains. According to Blodget, Concord, which is a central town of the state, situated in latitude 43.13°, longitude 71.29°, has an average mean annual temperature of 44.5°. In mean monthly figures the temperature reads as follows: January, 21.2°; February, 21.9°; March, 30.7°; April, 42.4°; May, 54.8°; June, 63.4°; July, 67.1°; August, 65.6°; September, 56.5°; October, 48.4°; November, 37°; December, 25°; thus giving a mean spring temperature of 42.6°; summer, 65.4°; autumn, 47.3°; and winter, 22.7° F.\* The fall of rain and melted snow, for the different seasons, at two different points, is as follows:

	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Portsmouth,	9.03 in.	9.21 in.	8.95 in.	8.38 in.	35.57 in.
Hanover,	9.90 "	11.40 "	10.50 "	9.10 "	41 "

The observations at Portsmouth were taken at Fort Constitution, which is situated on a peninsula at the most easterly point of the state; the other observations, at Dartmouth College (Hanover), which is much farther west.

*Study of the Table.*—It will be seen that 28 persons died of erysipelas in New Hampshire in 1870, out of a total population of 318,300, and that during the same time there were only six deaths from puerperal fever. The deaths from erysipelas among men

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\* These figures all read Fahrenheit.

and women were the same—that is, fourteen males and fourteen females. The decedents were all white and all native born, with a single exception. The deaths from puerperal fever show a mortality among the native born of 50 per cent., the foreign born coming in for the other half. The season of greatest mortality from erysipelas is spring; the season of greatest mortality from puerperal fever would be hard to determine, the spring, autumn, and winter having each the same number of deaths—that is, two. The month of the greatest mortality from erysipelas was March (six cases); the months of the greatest mortality from puerperal fever never exceeded one each.

*Reflections.*—No epidemic of puerperal fever could have prevailed in New Hampshire in 1870, and the cases reported must have been sporadic ones. Erysipelas must have carried off only its usual number of victims, for it can be seen that in proportion to population, the mortality was about the same as in Maine. The same may apply to the mortality from puerperal fever. The white native-born population are the victims of erysipelas. As in Maine, New Hampshire has late springs and long winters, and it seems again as though a low mean annual temperature favored the development of erysipelas. No statistics available in regard to the epidemic or endemic diseases of New Hampshire.

VERMONT.—West of New Hampshire and stretching over about the same parallel of latitude is the State of Vermont, separated from the State of New York by a long chain of small lakes which empty northward into the Richelieu river, which from thence empties its crystal waters into the mighty St. Lawrence. A chain of mountains runs through the central portion of the state. The altitude of most of Vermont above the level of the sea varies from 800 to 2,000 feet, and in the "Green Mountains," from which the state derives its name (*verd*, green; *mont*, mountain), it reaches an elevation of even 4,000 feet at points. At Burlington, which is situated at the extreme western center of the state, and on the eastern shore of Lake Champlain, in latitude 44.24° and longitude 73.11°, the mean annual temperature is about 45°, and the mean monthly temperature, according to Blodget, reads as follows: January, 20.5°; February, 20.4°; March, 31°; April, 47°; May, 55.2°; June, 64.9°; July, 69.9°; August, 68°; September, 59.6°; October, 47.6°; November, 36.1°; December, 23.9°—which gives an annual mean spring temperature of 42.7°; summer, 67.9°; autumn, 47.8°; winter, 21.6°. The fall of rain and melted snow at Fayette-

ville, Windham county, in the extreme southern portion of the state, is as follows for the different seasons: Spring, 12.78 inches; summer, 13.75 inches; autumn, 16.07 inches; winter, 11.39 inches; making a total for the year of 53.99 inches. At Burlington, according to Guyot,\* the annual rain-fall is about 34.15 English inches.

*Study of the Table.*—Twenty-two persons died of erysipelas in Vermont, in 1870, out of a total population of 330,551, and during the same time there were only five deaths from puerperal fever. The mortality from erysipelas, arranged according to sex, stands thus: Males, 10; females, 12. The decedents were all white, and native born, with the exception of one. The mortality of puerperal fever was wholly among the native born; by native born, be it understood, I mean those born anywhere in the limits of the United States. The season of greatest mortality from erysipelas was in the spring (9); the seasons of greatest mortality from puerperal fever were the summer and autumn, two deaths occurring at each of these epochs. The month of greatest mortality from erysipelas was September (5); that of puerperal fever July (two cases).

*Reflections.*—Evidently no epidemic of puerperal fever prevailed in the State of Vermont during the year 1870; while the mortality from erysipelas was not very great, and neither was there any epidemic of the latter disease. Vermont has suffered, however, from epidemics of erysipelas, as Dr. Drake† refers to an epidemic of the disease occurring as early as the *winter* of 1826, at Burlington, on the lake shore. The native-born population seem to be the only sufferers from either disease. Like Maine and New Hampshire, Vermont has a *low mean annual temperature*, and most of the state, as is the case with the first states mentioned, has a considerable elevation above the sea level, and therefore, as a matter of course, we must judge that the barometric pressure is usually much less than in the states lying farther south.

MASSACHUSETTS.—With most of its northern border lying in the neighborhood of latitude  $42.40^{\circ}$ , with most of its southern portion on a line with latitude  $42^{\circ}$ , and stretching from  $70^{\circ}$  longitude west, to near longitude  $73.20^{\circ}$  west, is the State of Massachusetts. The southeastern corner of the state, fringed by numerous islands, of which the largest are Martha's Vineyard and Nantucket, is almost

\* Guyot's Physical Geography, page 124. New York, 1873.

† Drake. The Principal Diseases of the Interior Valley of North America. Second Series. Philadelphia, 1854.

half a degree farther south than the balance of the state. According to Mitchell,\* "The western portion of the state is mountainous; a large portion of the remainder is hilly and undulating. In the southeast, the land is level and sandy." A hypsometric sketch of the state shows its eastern part to have an elevation gradually rising from the sea-coast to an altitude of less than 400 feet above the sea level; in the central and western portion of the state the altitude varies from 800 in the center, to as high as 2,000 feet in the extreme western portion of the state. Blodget gives Boston, which lies in latitude 42.20°, longitude 71.3° west, and at an altitude of 50 feet above the sea level, a mean annual temperature of 48.6° F. The mean monthly temperature reads as follows: January, 26.6°; February, 27.8°; March, 35.8°; April, 45.9°; May, 56.6°; June, 65.9°; July, 71.9°; August, 69.2°; September, 61.8°; October, 50.9°; November, 39.7°; December, 30.5°—making a mean spring temperature of 45.9°; summer, 69°; autumn, 50.8°; winter, 28.3°. At Cambridge, not far from Boston, and in the central eastern portion of the state; at New Bedford, in the extreme south of the state, and at Amherst, in the western center of the state, the mean rain-fall at the different seasons of the year is as follows:

	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Cambridge,	10.85 in.	11.17	12.57	9.89	44.48
New Bedford,	10.67 in.	9.18	10.76	10.42	41.03
Amherst,	10.23 in.	11.84	11.39	9.70	43.16

*Study of the Table.*—In 1870, Massachusetts, having a population of 1,457,351 persons, had a mortality of 150 from erysipelas and 51 from puerperal fever. As to sex, the mortality reads: Males, 84; females, 66. Of the decedents, 128 were white and native born, while 22 were of foreign extraction. The foreign decedents were from the following countries:

Sweden, Norway and Denmark .....	2
Ireland .....	14
England and Wales.....	1
Scotland.....	1
France.....	1
All others.....	3
<b>Total .....</b>	<b>22</b>

Of the decedents from puerperal fever, 34 were white and native born, and 17 were foreigners. The foreign decedents were as follows:

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\* Mitchell. A System of Modern Geography. Philadelphia, 1855.

Ireland .....	11
France.....	1
All others.....	5
	<hr/>
Total .....	17

The season of greatest mortality from erysipelas was winter (43); the season of greatest mortality from puerperal fever *was* winter (15); the month of greatest mortality from erysipelas was January (14); the months of greatest mortality from puerperal fever were May and January (May, 7; January, 7).

*Reflections.*—A study of these figures is a little interesting. It is seen at a glance that the deaths are a little beyond their usual number in proportion to the ratio of population. Let us anticipate a little, for instance, and taking the population of Rhode Island, add it to that of Maine, New Hampshire, and Vermont, and we see that we have a greater total population than has Massachusetts. Now, let us add the mortality of Rhode Island, in order to equalize matters. The calculation would read as follows:

Total population of Maine, New Hampshire, Vermont, and Rhode Island, in the year 1870.....	1,493,119
Total population in Massachusetts.....	1,457,351
Deaths in Massachusetts from erysipelas.....	150
Deaths in the four states named.....	118
	<hr/>
Excess in Massachusetts.....	32
Deaths in Massachusetts from puerperal fever.....	51
Deaths in the four states named.....	20
	<hr/>
Excess in Massachusetts.....	31

Now comes the natural query, why should the four states named, with a greater population than Massachusetts, have so much less a mortality from the same diseases? And is this increased mortality due to a general or a local cause? The solution of this problem is, I think, very simple. Turn back to the table and we shall see It is noticed that the different seasons of the year do not exhibit any marked difference in the mortality from either disease. *Then there could have been no epidemic*, and the increased mortality does not depend on a *general cause*. This leaves us, then, only a local cause; and where shall we look for a local cause in Massachusetts? I think the word *Boston* would probably answer the question; for it is a well-known fact that large and densely populated places favor the development of both diseases, and that hospitals are usually the foci from which the contagious germs emanate, and only need the fertile soil of filth and poverty, furnished by overcrowded

cities for their perfect germination. Yet another fact leads me to infer the same thing. At least 15 per cent. of the decedents from erysipelas were foreigners, the majority of them Irish; while 33½ per cent. of mortality from puerperal fever was among foreigners, and almost 33½ per cent. again of the foreign decedents in turn were Irish. This alone speaks in favor of my proposition; for it is well known that the Irish are a gregarious people, and that all the Atlantic sea-board cities have large Celtic populations—Boston being no exception to the rule. I am not prepared by statistics to defend my assertion in regard to Boston's being the cause of an increased mortality rate in Massachusetts (from erysipelas and puerperal fever), as compared with other New England states, having the same population. My inferences are all drawn from the table alone, be it remembered, and I shall only be too happy to have persons interested in the subject, correct mistakes I may make in regard to any of the "States," if by so doing they can throw light on the subject under investigation. More males than females, it will be noticed, died in Massachusetts in 1870. Massachusetts has a late spring and a long winter season, and a *low mean annual temperature*. The mortality from both erysipelas and puerperal fever was greatest, it will be seen, in the colder months. I have no statistics of epidemics of either disease, in the State of Massachusetts.

RHODE ISLAND.—Lying southwest of Eastern Massachusetts, and in about the same latitude, is the little State of Rhode Island. Most of the state has only a slight elevation above the level of the sea, except in the northwestern part of the state, where the country becomes hilly and reaches an altitude of several hundred feet. At Providence, in the northeastern part of the state, the mean monthly temperature, according to Blodget, reads as follows: January, 27.5°; February, 26.9°; March, 34.7°; April, 44°; May, 55.2°; June, 64.9°; July, 70.6°; August, 68.7°; September, 60.9°; October, 50.3°; November, 39.8°; December, 29.8°. So the temperature, by seasons or quarters, reads thus: Spring, 44.7°; summer, 68.1°; autumn, 50.3°; winter, 28.1°—an annual mean temperature of 47.9°. Providence has an altitude of 150 feet above the sea level, and is in latitude 41.49°, longitude 71.25° west of Greenwich. At Fort Adams,\* in the southeast of the state, and on the island of Rhode Island and at the entrance of Narraganset

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\* From the compilation in "Army Meteorological Register."

Bay, which "has an open and free exposure, mainly marine," the mean spring temperature is  $45.55^{\circ}$ ; summer,  $69.46^{\circ}$ ; autumn,  $53.56^{\circ}$ ; winter,  $30.22^{\circ}$ —an annual mean of  $49.70^{\circ}$ . The rain-fall in Providence (Records of Brown University) is: Spring, 10.45 (inches); summer, 9.66; autumn, 10.50; winter, 9.44; or a total for the year of 40.5 inches. The climate at this point, according to Dr. Satterlee, U. S. A., is most healthy.

*Study of the Table.*—The mortality "for the census year, ending June 1, 1870," in Rhode Island, from erysipelas, was 21, out of a total population of 217,353; during the same period there was but one death from puerperal fever. In regard to sex, the mortality from erysipelas stands: Males, 9; females, 12. The decedents from both diseases were all white; 15 of the decedents from erysipelas and the only decedent from puerperal fever were native born—the other six decedents from erysipelas were foreigners, five of them natives of Ireland. The season of greatest mortality from erysipelas was in the winter (6); the only patient dying of puerperal fever, died in the summer (month of July). The month of greatest mortality from erysipelas was September (4).

*Reflections.*—It is very plain that no connection existed here between the 21 cases of erysipelas and the single one of puerperal fever. In proportion to its population, the State of Rhode Island, however, exhibits a larger mortality from erysipelas than any of the other New England states, and at the same time a smaller proportion of deaths from puerperal fever. No epidemic of erysipelas prevailed at any one of the seasons, for the table shows that. Could the increase of erysipelas have been owing to traumatic causes? for Rhode Island is full of cotton-mills, and accidents among operatives are not of unfrequent occurrence. It is seen, again, that all the decedents are white, and most of them native born.\*

CONNECTICUT.—Between latitudes  $41^{\circ}$  and  $42^{\circ}$ , and its greater portion lying west of longitude west  $72^{\circ}$  from Greenwich, is the state of "wooden nutmegs." The surface of the country in the State of Connecticut is varied. A hypsometric sketch shows that the eastern and southeastern portion is but slightly elevated above the level of the sea. The land becomes higher in the west of the state,

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\* Dr. Parsons, author of a report on the "Medical Topography and Epidemic Diseases of the State of Rhode Island," which may be found in the Transactions of the "American Medical Association" (Vol. XV, p. 205), makes no special mention of erysipelas or puerperal fever.

and in the north of the state becomes hilly, near the Massachusetts state line; the altitude above the level of the sea varying from 50 to 800 and even 1,000 feet. At New London, in New London county, and at the entrance of the Thames river, in latitude 41.21°, longitude 72.6°, and 23 feet above the level of the sea, the mean monthly temperature, according to Blodget, reads as follows: January, 29.1°; February, 29.6°; March, 36.1°; April, 46.8°; May, 56.3°; June, 66.1°; July, 71.5°; August, 70.1°; September, 63.3°; October, 53°; November, 42.3°; December, 31.1°; giving an annual mean of 49.6°; or in seasons it would stand thus: Spring, 46.4°; summer, 69.3°; autumn, 52.9°; winter, 29.9°. At Fort Trumbull,\* about a mile lower down than New London, "on the right bank of the river Thames," and a little over two miles from Long Island Sound, the rain-fall in seasons reads as follows: Spring, 10.90 inches; summer, 10.65; autumn, 13.16; winter, 10.98; or an average mean annual fall, rain and melted snow, of 45.69 inches.

*Study of the Table.*—The mortality for the census year 1870, in the State of Connecticut, from erysipelas, was 38, out of a total population of 537,454; during the same time there were 15 deaths from puerperal fever. As regards sex, the decedents from erysipelas read: Males, 20; females, 18. All the decedents from erysipelas, with but one exception, were whites, and all were native born. The decedents from puerperal fever were all white; nine being native born, the other six foreigners. The season of greatest mortality from erysipelas was spring (18); the season of greatest mortality from puerperal fever, spring (7). The months of greatest mortality from erysipelas were March and May (7 each); month of greatest mortality from puerperal fever, May (5).

*Reflections.*—Some slight connection seems to exist here between the two diseases; that is, they were both most prevalent at about the same season and month. No epidemic seems to be indicated, of either disease. The mortality is in about the same proportion to population as in the balance of New England. More decedents were native born than foreign. All the decedents were whites, with but one exception. Almost fifty per cent. of the mortality from both diseases was in the spring.

EN RESUME.—Covering an area of over 74,000 square miles, and with a population of nearly three and a half million souls pestling on its bosom, the portion of the United States known as New

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\* Compiled from "Government Reports."

England claims to be the most densely settled section of North America. The surface of all New England, according to Guyot, is very broken and irregular, except along the Atlantic sea-board; the coast lands are flat, and in Southeastern Massachusetts very low and exceedingly sandy. The whole section is interspersed with small running streams and chains of lakes and lakelets, while the higher lands and mountains are covered with pine-forests; the country is charming, and the surgeons at various posts on the North Atlantic coast, and along the northwestern frontier, speak in high terms of the salubrity of the New England climate. The mean annual temperature in the far north (Fort Kent, Maine), is about 37° F.; in the far south (Newport, Rhode Island), 50° F. It varies from these two extremes at various points in the section, as will be seen, if the statements before made, in regard to various meteorological observations at different posts in New England be carefully noted. New England is traversed by the isothermal lines of 40°, 44°, and 48°, as a temperature chart belonging to the Smithsonian Institute, Washington City, prepared by Prof. Joseph Henry,\* clearly exhibits. The greatest fall of rain in New England occurs in the summer and autumn months, when the fall of water, measured by English inches, exceeds the annual fall of snow and rain of the spring and winter seasons, Rhode Island perhaps excepted, where at points the winter and spring rain-fall exceeds that of summer and autumn. Being in the far south of New England, and with a higher mean annual temperature than other portions of the section under discussion, may perhaps explain this difference. In this connection, the high mortality rate from erysipelas and the almost total absence from puerperal fever may be noticed as being a little curious. The spring and winter are, then, the coldest and driest seasons in New England. Let us now turn to the study of our table. It will be noticed that the columns are footed up, giving the total mortality from both diseases in all New England, the months in which the deaths occurred, the seasons of greatest mortality; the statement reads from right to left, the same as in the case of the individual "States."

*Study of the Table.*—The mortality from erysipelas in all New England, according to the census year, 1870, was 306; during the same time there were 86 deaths from puerperal fever, or a total mortality from both diseases of 392. As regards sex, the mortality

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\* Embodied in Census of 1870.

stands thus: Males, 167; females, 139 (*erysipelas*). The decedents from both diseases *were all whites*, with but one exception, one person of color having died of erysipelas in Connecticut. Of the decedents from erysipelas, 275 were native born, the remainder (31) foreigners; 58 of the decedents from puerperal fever were native born, the remainder (28) were foreigners, mostly Irish. The season of greatest mortality from erysipelas in New England is spring (92); the season of greatest mortality from puerperal fever is spring (28). The month of greatest mortality from erysipelas is April (34); the month of greatest mortality from puerperal fever, May (12).

*Reflections.*—No epidemic from either disease prevailed in New England during the census year, 1870. The supposition is that all cases of erysipelas and puerperal fever were sporadic. If any local epidemic occurred, it must have been speedily stamped out, for the figures do not show either disease to have been very prevalent in New England at that time; besides, there was not such a great difference in the mortality rate from either disease at any one season. With a foreign population of 648,000, New England lost 59 of them from both diseases. The foreign-born population of New England form almost one-fifth of the whole on a rough calculation; and it is very plain from this fact that foreigners are more exempt from erysipelas in New England than are the native born. On the contrary, in proportion to population, the foreign born suffer more from puerperal fever than do the native born, although the words *lying-in establishments* might possibly force us to reverse this last observation, as it is a well-known fact that the hospitals of large cities are more resorted to by the foreign than the native born, and that the mortality among women confined in hospitals is greater than in private practice. New England has in its greater part an altitude of some hundreds of feet above the level of the sea. The temperature of this section at the time both diseases prevail most is not very high. In April, the month erysipelas prevails the most in New England, the mean monthly temperature in Northern Maine is about 35° F., and gradually increases, of course, as we go south; as in the southern part of Connecticut (New London) we find it to be 46° F. in April.

It is not my intention to dwell on the influence of climate in the development of either disease at this point, but perhaps this subject may be touched on before the article is concluded. The

greatest mortality in any one month from puerperal fever was the month succeeding the greatest mortality from erysipelas. It is a little singular that out of a total colored population of 31,705, there should have been but one death from either disease, and that erysipelas. The colored population of New England, as I figure them up from the census tables, and have them arranged according to sex, read as follows: Males, 15,399; females, 16,306. Not a single death occurred from puerperal fever among the female colored population, of whom, I think it is safe to say, a large proportion must be at the child-bearing period of life. And 7,245 colored females live in Massachusetts alone, where the greatest mortality from puerperal fever occurred.

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## SECTION SECOND.

### MIDDLE AND SOUTHERN STATES.

In the midst of one's weary search after information, it is pleasant to find, ever and anon, some article which serves the purpose of a "ready reckoner"—an oasis blooming and bearing fruit (in the shape of facts and statistics), amid deserts barren of references. Such an article we find that of Joseph M. Smith's,\* of New York, to be. The geology, mineralogy, flora, fauna, and ethnography of the "great State" of New York are each carefully studied in detail; also, the climatology and meteorology, etc.

Says Smith (page 85), in speaking of the "geography and hydrography" of the state: "The form of the State of New York is nearly triangular; its most southern part, including Long Island, rests on the Atlantic ocean, and gives it a sea-board of about 130 miles. Its northern and western part is bounded throughout nearly its whole extent by the upper waters of the river St. Lawrence, Lake Ontario, Niagara river, and a portion of Lake Erie. Its remaining frontiers, on the north and east, are conterminous with Connecticut, Massachusetts, Vermont, and Canada East, and on the south with New Jersey and Pennsylvania. Its territorial area is about 46,000 square miles, the whole lying between 40° 30' and 45° of north latitude, and between 71° 50' and 79° 55' west

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\* Report on the Medical Topography and Epidemics of the State of New York. By Joseph M. Smith, M. D. Transactions of the American Medical Association, Vol. XIII, 1860.

longitude." Smith gives numerous tables regarding meteorology; but as the writer had already compiled tables from Blodget for all the different states, for the sake of uniformity of arrangement, we shall quote Blodget, but in addition, however, give one of Smith's most elaborate tables. The mean monthly temperature in various sections of the state, as I have arranged it from Blodget, reads as follows:

Fort Hamilton, New York Harbor—Latitude  $40^{\circ} 37'$ , longitude  $74^{\circ} 2'$ , altitude 25 feet above sea level: January,  $31.6^{\circ}$ ; February,  $30.9^{\circ}$ ; March,  $38.1^{\circ}$ ; April,  $44.3^{\circ}$ ; May,  $57.8^{\circ}$ ; June,  $67.8^{\circ}$ ; July,  $73.2^{\circ}$ ; August,  $73^{\circ}$ ; September,  $66.6^{\circ}$ ; October,  $55.2^{\circ}$ ; November,  $45.6^{\circ}$ ; December,  $34.3^{\circ}$ . Albany, N. Y.—Latitude  $42^{\circ} 31'$ , longitude  $73^{\circ} 41'$ , altitude 130 feet above the sea level: Temperature in January,  $24.3^{\circ}$ ; February,  $25.4^{\circ}$ ; March,  $35^{\circ}$ ; April,  $47.2^{\circ}$ ; May,  $59.6^{\circ}$ ; June,  $68^{\circ}$ ; July,  $72.1^{\circ}$ ; August,  $70^{\circ}$ ; September,  $61.4^{\circ}$ ; October,  $49.4^{\circ}$ ; November,  $39.2^{\circ}$ ; December,  $28.4^{\circ}$ . At Potsdam, St. Lawrence county—Latitude  $44^{\circ} 40'$ , longitude  $73^{\circ} 44'$ , altitude 394 feet above the sea level, as follows: January,  $18.4^{\circ}$ ; February,  $18.8^{\circ}$ ; March,  $30^{\circ}$ ; April,  $43.7^{\circ}$ ; May,  $55^{\circ}$ ; June,  $63.9^{\circ}$ ; July,  $68.4^{\circ}$ ; August,  $66.7^{\circ}$ ; September,  $57.4^{\circ}$ ; October,  $45^{\circ}$ ; November,  $33.7^{\circ}$ ; December,  $22.1^{\circ}$ . At Auburn—Latitude  $42^{\circ} 55'$ , longitude  $76^{\circ} 28'$ , altitude 650 feet above the sea level, as follows: January,  $24.4^{\circ}$ ; February,  $24.6^{\circ}$ ; March,  $33.5^{\circ}$ ; April,  $45.3^{\circ}$ ; May,  $54.4^{\circ}$ ; June,  $63.5^{\circ}$ ; July,  $69.8^{\circ}$ ; August,  $68.2^{\circ}$ ; September,  $54.4^{\circ}$ ; October,  $48.2^{\circ}$ ; November,  $37.7^{\circ}$ ; December,  $29.5^{\circ}$ . Or reading by seasons, or annually, as follows:

	SPRING.	SUMMER.	AUTUMN.	WINTER.	AN. MEAN.
Fort Hamilton,	$46.7^{\circ}$	$71.3^{\circ}$	$55.8^{\circ}$	$32.3^{\circ}$	$51.5^{\circ}$
Albany,	$46.7^{\circ}$	$70^{\circ}$	$50^{\circ}$	$26^{\circ}$	$48.2^{\circ}$
Potsdam,	$42.9^{\circ}$	$66.3^{\circ}$	$45.4^{\circ}$	$19.8^{\circ}$	$43.6^{\circ}$
Auburn,	$44.4^{\circ}$	$67.2^{\circ}$	$48.4^{\circ}$	$26.2^{\circ}$	$46.8^{\circ}$
Jamaica, L. I.	$47.3^{\circ}$	$68.9^{\circ}$	$51.8^{\circ}$	$30.4^{\circ}$	$49.6^{\circ}$
West Point,	$48.7^{\circ}$	$71.3^{\circ}$	$53.2^{\circ}$	$29.7^{\circ}$	$50.7^{\circ}$

The monthly, quarterly, and annual mean temperatures in different sections are here seen at a glance, and the different climates of New York can be noted. The mean quarterly fall of rain and melted snow at different sections of New York reads as follows (in inches):

	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Hamilton,	11.69	11.64	9.93	10.39	43.65
West Point,	12.57	12.43	10.74	10.79	46.53
Albany,	9.79	13.31	10.27	8.30	40.67
Cherry Valley,	9.76	12.16	10.73	8.48	41.13

The following beautifully arranged table, by Dr. Smith, gives a concise view of the mean annual temperature at the various "isothermal meteorological stations" of the state :

## ANNUAL MEAN TEMPERATURE.

- 42°—Bridgewater and Pompey.  
 43°—Fairfield, Franklin (Malone), Lowville, Ogdensburg, Gouverneur, Oneida Conference St. Lawrence.  
 44°—Cherry Valley, Liberty, Cortland, Mexico, Hamilton, Johnstown, Oxford, Plattsburg.  
 45°—Cambridge, Canajoharie, Canandaigua, Monroe, Granville, Palmyra, Schenectady, Springville, Utica.  
 46°—Amenia, Auburn, Buffalo, Delaware, Gaines, Hartwick, Middlebury, Millville, Rochester, Washington, Madison Barracks, Fort Ontario, Buffalo Barracks.  
 47°—Farmers' Hall, Hudson, Kinderhook, Lansingburg, Lewistown, Mt. Pleasant, Onondaga, Syracuse, Fort Niagara.  
 48°—Albany, Clinton, Fredonia, Greenville, Ithica, Montgomery, North Salem, Redhood, Watervliet.  
 49°—Cayuga, Kingston, Newburg, Union Hall.  
 50°—Dutchess, Oyster Bay, West Point.  
 51°—Erasmus Hall, New York Institution for Deaf and Dumb, Forts Hamilton and Columbus (New York Harbor).

Prof. Guyot, according to Smith, divides the state into five physical regions, *i. e.*, the "Southern or Maritime Region," which takes in almost all the state south of the Highlands; "The Eastern Region, or Hudson Valley," extending from the Highlands to Lake Champlain; "The Western Region, or high table-lands between the Hudson Valley and Lake Erie;" fourthly, "The Region of the Great Lakes," which includes all the territory from the eastern part of Lake Erie, the southern shores of Ontario to Lake Oneida; lastly, "the Northern Region," all the country known as the "*Adirondack Region*" (immortalized by Murray), which, extending northward to the Canada line, has Lake Champlain on its east, the Mohawk Valley on the south, and is kissed on its western border by the bright blue waters of Ontario. A hypsometric sketch would show the southern region to be low; the eastern region elevated about 1 to 200 feet; the western region with an elevation of from 1,000 to 2,000 feet; the region of the lakes from 150 to 600 feet, and the northern region from 200 to 1,400, 2,100, and even 5,000 feet above the sea level.

*Study of the Table.*—The mortality (for the census year 1870) from erysipelas in the State of New York, out of a total popula-

tion of 4,382,759 persons, was 455; during the same period the mortality from puerperal fever was 235. As regards sex, 253 males and 202 females died of erysipelas. Of the decedents from erysipelas, 355 were whites and native born, 1 unknown, and 99 foreigners. Of the decedents from puerperal fever, 82 were native-born whites and the other 153 were foreigners. The foreign decedents from both diseases I have arranged according to nativity in the following table:

NATIVITY.	ERYSIPELAS.	PUERPERAL FEVER.
Germany .....	31	57
Sweden, Norway.....	1	2
Ireland .....	45	85
England, Wales.....	14	2
Scotland.....	4	0
France, Italy.....	1	2
All others.....	3	5
Total.....	99	153

The season of greatest mortality from erysipelas was spring (165); the season of greatest mortality from puerperal fever was spring (89). The month of greatest mortality from erysipelas was March (61); the month of greatest mortality from puerperal fever was March (38).

*Reflections.*—In proportion to population, the mortality from erysipelas in New York seems to be no greater than in the New England states. The deaths from puerperal fever, however, seem to be in excess. It is noticed that both diseases must have been most prevalent at about the same time, as the season and month of greatest mortality in the two cases were the same. It will be again observed that no colored persons died of either disease, and the colored population of New York at the last census was 52,081, of whom 25,080 were males and 27,001 were females. It will be also noticed how large the mortality from both diseases is among foreigners, and still we become aware on consulting the census why this is.

The State of New York has within its limits 1,138,353 foreigners, or more than one-fifth the total (5,567,229) foreign-born population of the entire "United States;" 566,037 of these foreigners are males and 572,316 females. The total population of New York, in 1870, was 4,382,759; so more than one-quarter or 25 per cent. of the population of New York is foreign born. Now, on a

rough calculation of 25 per cent., there was least mortality from erysipelas among the foreign born; on the contrary, the mortality from puerperal fever was almost twice as much among the foreign as compared with the native-born. A like condition of affairs, it will be remembered, existed in New England. New York city is undoubtedly responsible for most of the puerperal fever for the same reasons we gave in referring to Boston.\*

No serious epidemic of either disease could have prevailed in the State of New York, although there may have been a slight outbreak in the spring of both diseases. Smith† says, speaking of epidemic erysipelas, that “such a disease is among the more formidable meteoric epidemics which periodically visit the State of New York.” In 1825, Dr. Fountain described the epidemic as it prevailed in Putnam and Westchester counties (New York city is in Westchester county). Fountain,‡ quoted by Smith, says: “An epidemic commenced about the 1st of February, 1825, and continued in scattering cases even as late as the 1st of August. The

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\* In a “Report on the Mortality of the City of New York,” by Cyrus Ramsey, M. D. (Registrar of Records and Statistics), published in the Transactions of the “American Medical Association,” Vol. XV, 1864, may be found a full report of all deaths from all diseases for the thirteen years prior to 1864. From these tables we have arranged the following:

*Table exhibiting Mortality from Puerperal Fever and Erysipelas from 1851 to 1863.*

PUERPERAL FEVER.	ERYSIPELAS.	YEAR.
165	205	1851
155	156	1852
98	114	1853
141	147	1854
131	140	1855
130	114	1856
111	139	1857
173	156	1858
168	141	1859
154	107	1860
151	130	1861
115	131	1862
53	124	1863

This table is an interesting study of itself, and is proof positive of what has been asserted, *i. e.*, that the “Great City” is responsible for the heavy mortality from both diseases.

† *Ib.* 266.

‡ “New York Medical and Physical Journal, Vol. IV, 1825.”

number of cases that occurred was not less than 250, and that of the deaths about 30. Compared to *many former epidemics*, it appears indeed insignificant, yet it was attended with peculiarities not altogether uninteresting." Just before this epidemic an epizootic, called "the slavers," affected horses. (It was also noticeable that the epizootic was prevalent in this city, Cincinnati, during the last epidemic of puerperal fever, we may remark here in parenthesis.) Quoting Smith again, we will conclude our remarks regarding the State of New York: "As an epidemic erysipelas has occasionally appeared in various other parts of the state, Dr. Sprague informs us that it prevailed in the southern part of Otsego county in the autumn and winter of 1842-43, and that it raged there in two or three towns with fearful mortality," etc. So much for the epidemics of New York; let us now turn to the State of New Jersey.

NEW JERSEY.—Lying directly south of New York and directly east of Pennsylvania, the State of New Jersey stretches its length from about latitude  $39^{\circ}$  to a little north of  $41^{\circ}$ ; its extreme eastern or Atlantic coast in the neighborhood of longitude  $74^{\circ}$  west of Greenwich at Sandy Hook, and its western boundaries at points overlapping  $75^{\circ}$  longitude W. Greenwich; 8,320 square miles are embraced within the limits of the state. According to Mitchell, "the northern part of the state is mountainous, and is a fine grazing country; the middle part is level and well cultivated; the south is low and sandy." A hypsometric sketch of the state shows it to have an elevation above the sea level of from 25 to 1,500 feet. As it has been settled since 1617, some sanitary records of the state must have been kept; but I have been unable to find even a reference to the epidemics of New Jersey among the limited number of works at my command. At Trenton, in the western part of the state, the mean monthly temperature, according to Blodget, reads as follows: January,  $30.9^{\circ}$ ; February,  $32.5^{\circ}$ ; March,  $38.8^{\circ}$ ; April,  $50.9^{\circ}$ ; May,  $58.5^{\circ}$ ; June,  $67.7^{\circ}$ ; July,  $72.8^{\circ}$ ; August,  $71.6^{\circ}$ ; September,  $63.4^{\circ}$ ; October,  $51.5^{\circ}$ ; November,  $41.3^{\circ}$ ; December,  $32.6^{\circ}$ ; or reading by seasons as follows: Spring,  $49.4^{\circ}$ ; summer,  $70.7^{\circ}$ ; autumn,  $52.1^{\circ}$ ; winter,  $32^{\circ}$ —thus giving a mean annual temperature of  $51.1^{\circ}$ . Trenton is in latitude  $40^{\circ} 13'$  and longitude  $74^{\circ} 45'$  W. Greenwich, and has an elevation above the sea level of fifty feet.

At Lambertsville, latitude  $40^{\circ} 23'$ , longitude  $74^{\circ} 55'$ , and at an altitude above the sea-level of 95 feet, the monthly temperature is as follows: January,  $30.4^{\circ}$ ; February,  $30^{\circ}$ ; March,  $38.8^{\circ}$ ; April,  $49.5^{\circ}$ ; May,  $60.4^{\circ}$ ; June,  $69.3^{\circ}$ ; July,  $74.7^{\circ}$ ; August,  $71.9^{\circ}$ ; September,  $63.9^{\circ}$ ; October,  $51.6^{\circ}$ ; November,  $41.8^{\circ}$ ; December,  $32^{\circ}$ —giving a mean annual of  $51.2^{\circ}$ ; or, reading by seasons, as follows: Spring,  $49.6^{\circ}$ ; summer,  $72^{\circ}$ ; autumn,  $52.4^{\circ}$ ; winter,  $30.8^{\circ}$ . At Lambertsville the mean annual rain-fall at the different seasons is as follows: Spring, 11.25 inches; summer, 12.15; autumn, 11.59; winter, 9.67—giving an annual of 44.9 English inches of rain and melted snow.

*Study of the Table.*—The mortality in New Jersey, for the year 1870, from erysipelas, was 62, out of a total population of 906,096. During the same year there were nine deaths from puerperal fever. As regards sex, the decedents from erysipelas were equally divided, *i. e.* 31 males and the same number of females. Of the decedents, 54 were whites and native born, and 8 were foreigners. Of the decedents from puerperal fever, 6 were native born and 3 ( $33\frac{1}{3}$  per cent.) were foreigners. The season of greatest mortality from erysipelas was spring (22); the season of greatest mortality from puerperal fever was winter (4). The month of greatest mortality from erysipelas was March (10); the month of greatest mortality from puerperal fever was February (3).

*Reflections.*—In proportion to population the mortality from erysipelas in New Jersey was not excessive. Puerperal fever evidently had no connection with erysipelas, and all the cases of fever must have been sporadic ones. Out of a total foreign population of 188,943 (96,187 males and 92,756 females), only 8 died of erysipelas. The mortality from this disease was greater among the native than among the foreign born. On the contrary, more foreign born died from puerperal fever, in proportion to population, than native born. Out of a total colored population of 30,658 (15,064 males and 15,594 females), no deaths from either disease seem to have occurred. As before stated, no records of epidemic erysipelas or puerperal fever prevailing in New Jersey are available.

PENNSYLVANIA.—With an area of 46,000 square miles, the State of Pennsylvania extends from east to west between the latitudes of about  $39^{\circ} 45'$  and  $42^{\circ}$ , and from near longitude  $75^{\circ}$  to about  $80^{\circ} 30'$  west, and had a population, according to the last census, of

3,521,951 souls. According to Mitchell, "The eastern portion of the state is mostly level, the center is mountainous, the western part is moderately hilly." A hypsometric sketch of the state shows an elevation varying from a few hundred to several thousand feet above the level of the sea. The higher ground is near the central portion of the state, where the Blue Ridge and Alleghany Mountains cross from northeast to southwest.

In the city of Philadelphia, at the "Pennsylvania Hospital" (latitude  $39^{\circ} 56'$ , longitude  $75^{\circ} 12'$ , and altitude above the sea-level of 40 feet), the mean monthly temperature, according to Blodgett, reads as follows: January,  $31.8^{\circ}$ ; February,  $32.3^{\circ}$ ; March,  $41^{\circ}$ ; April,  $51.8^{\circ}$ ; May,  $62.5^{\circ}$ ; June,  $71.5^{\circ}$ ; July,  $76^{\circ}$ ; August,  $73.2^{\circ}$ ; September,  $63.8^{\circ}$ ; October,  $54.5^{\circ}$ ; November,  $44^{\circ}$ ; December,  $34.5^{\circ}$ —giving an annual mean of  $53.1^{\circ}$ . At Germantown, in southeastern Pennsylvania, not far from Philadelphia (latitude  $40^{\circ} 03'$ , longitude  $75^{\circ} 10'$ , and altitude of 70 feet above the sea-level), as follows: January,  $30^{\circ}$ ; February,  $31.1^{\circ}$ ; March,  $41.2^{\circ}$ ; April,  $49.4^{\circ}$ ; May,  $61.3^{\circ}$ ; June,  $71.2^{\circ}$ ; July,  $75^{\circ}$ ; August,  $73^{\circ}$ ; September,  $65^{\circ}$ ; October,  $53.5^{\circ}$ ; November,  $42.6^{\circ}$ ; December,  $32.6^{\circ}$ —giving an annual mean of  $52.3^{\circ}$ . At Lancaster (latitude  $40^{\circ} 02'$ , longitude  $76^{\circ} 21'$ , altitude 300 feet above the sea-level), as follows: January,  $30.1^{\circ}$ ; February,  $32.4^{\circ}$ ; March,  $40.7^{\circ}$ ; April,  $52.1^{\circ}$ ; May,  $60^{\circ}$ ; June,  $68.4^{\circ}$ ; July,  $73.4^{\circ}$ ; August,  $71.8^{\circ}$ ; September,  $64.7^{\circ}$ ; October,  $52.1^{\circ}$ ; November,  $39.6^{\circ}$ ; December,  $32.2^{\circ}$ ; or a mean annual of  $51.4^{\circ}$ . At Pittsburgh, in the extreme western portion of the state, latitude  $40^{\circ} 32'$ , longitude  $80^{\circ} 02'$ , altitude 704 feet above the level of the sea), as follows: January,  $29.1^{\circ}$ ; February,  $31.2^{\circ}$ ; March,  $39^{\circ}$ ; April,  $50^{\circ}$ ; May,  $60.9^{\circ}$ ; June,  $69.2^{\circ}$ ; July,  $73^{\circ}$ ; August,  $71.2^{\circ}$ ; September,  $63.6^{\circ}$ ; October,  $50.9^{\circ}$ ; November,  $39.8^{\circ}$ ; December,  $31.3^{\circ}$ ; or a mean annual of  $50.8^{\circ}$ . Calculated by seasons the temperature reads as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.
Philadelphia .....	51.8°	73.6°	54.1°	32.9°
Germantown .....	50.6	73	53.7	31.9
Lancaster.....	50.9	71.2	52.1	31.6
Pittsburgh.....	50	71.4	51.4	30.6

It will be noticed that I have chosen stations from east to west, in the southern part of the state, near latitude  $40^{\circ}$ , for the reason that the larger cities and towns of the state are in the neighborhood of this parallel; and, besides, the isothermals of Southern

New York, before given, might answer for Northern Pennsylvania, in this rough calculation. The mean fall of rain and melted snow at the various seasons reads as follows :

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Philadelphia.....	10.97	12.45	10.07	10.06	43.56
Germantown .....	8.56	10.95	9.78	8.81	38.10
Pittsburgh.....	9.38	9.87	8.23	7.48	34.96

It will be noticed that there is a diminished rain-fall from east to west, and that the temperature at the different seasons, along the neighborhood of the 40th parallel, becomes lower from east to west.

*Study of the Table.*—The mortality (during the census year 1870) from erysipelas, in the State of Pennsylvania, was 282, out of a total population of 3,521,951 persons. During the same time 108 women died of puerperal fever. In regard to sex, 154 of the decedents from erysipelas were men and 128 were women. Of the decedents from erysipelas, the nativity of 2 was unknown; 242 were native born, of whom 5 were colored; and 38 were foreigners. Of the decedents from puerperal fever, 77 were native born (one of whom was colored), and 31 were foreigners. I shall arrange their nativity as follows :

NATIVITY.	ERYSIPELAS.	PUERPERAL FEVER.
Ireland.....	18	18
Germany.....	9	8
England and Wales.....	8	4
Scotland.....	1	1
North of Europe.....	2	0
Total.....	38	31

The season of greatest mortality from erysipelas was spring (83). The season of greatest mortality from puerperal fever was spring (44). The month of greatest mortality from erysipelas was April (34). The month of greatest mortality from puerperal fever was May (17).

*Reflections.*—In proportion to population the State of Pennsylvania suffered less from erysipelas than most of the states before-mentioned. The same may be said in regard to puerperal fever. It is evident that no extensive epidemic of either disease could have prevailed. Out of a total foreign population of 544,859 (289,946 males and 254,913 females), 38 died of erysipelas: so the mortality from this disease was greatest among the native born. On the contrary, the mortality from puerperal fever was greatest

among the foreign born, almost one-third the decedents being foreigners. Out of a total colored population of 65,294 (31,077 males and 34,217 females), five died of erysipelas and one of puerperal fever. Philadelphia is responsible for most of the mortality; and from statistics culled from a report\* of the "Board of Health" of that city in 1872, we gather the following: "*Erysipelas*.—81 deaths were reported from this cause, an excess of 24 over the number registered in 1871; 42 were of males and 39 were of females. March (15) and April (11) were the months of greatest mortality, and September (1) of the least mortality. The deaths in each season were as follows: Spring, 32; summer, 16; autumn, 11; winter, 22." We observe that the same report gives the deaths from puerperal fever in 1872 as being 22. The years 1871 and 1872 were the years of the small-pox epidemic, and as in the declining of small-pox, erysipelas very frequently supervenes, the light mortality for the latter disease should be especially noted. The epidemics of puerperal fever in the State of Pennsylvania have been before noted (refer to Meigs and Churchill); also those epidemics of erysipelas which occurred at Uniontown and Laurel Mount (refer to Drake).

We shall now turn to the little State of Delaware.

DELAWARE.—Lying between longitude  $75^{\circ}$  and  $76^{\circ}$ , and crossed about its central portion by the 39th parallel of north latitude, is the State of Delaware. This state is only 95 miles long and 25 miles wide. The county of New Castle, in North Delaware, is "hilly and rocky;" then comes the red-clay region of Kent county, and in Sussex, the far southern county, is the "level, sandy" part of the state. A hypsometric sketch of the state shows that it has not an elevation of 400 feet above the sea-level at any point. According to Blodgett, the mean monthly temperature at Fort Delaware (latitude  $39^{\circ} 35'$ , longitude  $75^{\circ} 34'$ , altitude 10 feet above the sea-level), reads as follows: January,  $33.7^{\circ}$ ; February,  $35.8^{\circ}$ ; March,  $43^{\circ}$ ; April,  $52.3^{\circ}$ ; May,  $65.3^{\circ}$ ; June,  $73.8^{\circ}$ ; July,  $70.8^{\circ}$ ; August,  $70.6^{\circ}$ ; September,  $70.9^{\circ}$ ; October,  $58^{\circ}$ ; November,  $46.6^{\circ}$ ; December,  $39.3^{\circ}$ —giving a mean annual of  $56.1^{\circ}$ ; or, reading by seasons: Spring,  $53.5^{\circ}$ ; summer,  $75.9^{\circ}$ ; autumn,  $58.5^{\circ}$ ; winter,  $36.3^{\circ}$ . I can find no record of the mean fall of rain and melted snow in the State of Delaware.

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\* Report of the Board of Health of the City and Port of Philadelphia, 1873, p. 57.

Dr. Bush\* speaks of no epidemics of erysipelas or puerperal fever in his little monograph on the epidemics of the state. Dr. Marshall, of Milford, Delaware (quoted by Bush), says: "We have had our usual amount of pneumonia, rheumatism, and erysipelas, and no more."

*Study of the Table.*—Out of a total population of 125,015, Delaware lost 12 persons from erysipelas during the census year 1870, and only 1 person from puerperal fever. As regards sex, the decedents from erysipelas were equally divided (6 males, 6 females), and 11 of them were native-born whites and 1 native-born colored. The death from puerperal fever was a native-born white woman. The season of greatest mortality from erysipelas was autumn (6). The only death from puerperal fever was in March. The months of greatest mortality from erysipelas were October, November, and December (3 each).

*Reflections.*—It is noticed that three-fourths of the mortality from erysipelas occurred during three months. Taking the small population, and knowing the slight rate of mortality from erysipelas, it looks as though there might have been a slight epidemic tendency during that year. If there was, however, it must have been very slight; and no possible connection could have existed between the disease in question and puerperal fever: for we see only one sporadic case of the latter, and it occurred in a month when no deaths from erysipelas were reported (March). Nearly one-sixth of the population of Delaware is colored (*i. e.* 22,794—11,480 males and 11,314 females); therefore more whites than blacks, in proportion to population, died of erysipelas. Out of a total foreign population of 9,120 (4,657 males and 4,463 females), there were no deaths from either disease, the native born seeming to be the only sufferers.

RESUME.—Guyot gives a general description of the "Middle States" in the following language: "These states lie in the middle part of the Appalachian mountain region, extending from Lake Champlain to Lake Erie, and from the Atlantic to the Ohio river. The Appalachian mountains extend through this section from northeast to southwest, in long parallel ranges, separated by broad and very fertile valleys. The principal ranges of the system are

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\* Report on the Climatology and Epidemic Diseases of Delaware. By L. P. Bush, M. D. Transactions of the American Medical Association, Vol. XXIII, 1872.

the Blue Ridge and Alleghany range, between which are several lower ranges. All the ranges are broken by frequent cross-valleys or gorges. Through these the rivers find their way, from the Alleghany range and the plateau at its western base, across the entire system to the Atlantic ocean. East of the mountains a *hilly country* extends about half-way to the sea. Beyond this is a low, flat *coast district*, which is either sandy or marshy. West of the mountains is a low plateau, which descends westward to the low plains of the Mississippi." A hypsometric sketch of this section shows an elevation varying from a few hundred to several thousand feet above the sea-level.

*Study of the Table.*—It will be noticed that the total mortality, for the census year 1870, in the "Middle States," from the single cause of erysipelas alone was 811. During the same time 353 women died of puerperal fever. As regards sex, the decedents from erysipelas numbered 444 males and 367 females. The season of greatest mortality from erysipelas was spring (271). The season of greatest mortality from puerperal fever was spring (136). The month of greatest mortality from erysipelas was April (95). The month of greatest mortality from puerperal fever was March (53).

*Reflections.*—The population of the "Middle States" is over 9,000,000. On a rough estimate, then, the mortality from erysipelas in the "Middle States," in proportion to population, is about the same as in New England. On the contrary, the mortality from puerperal fever in the Middle States exceeds that of the New England States, in proportion to population, by almost one-third. The erysipelas prevails more among the native than the foreign born, and puerperal fever much more among the foreign than the native born. More than 50 per cent. of the puerperal fever decedents, it will be noticed, were foreigners. It will be also noticed that the spring was the season when both diseases were most prevalent, and that the greatest mortality, occurring in March, was followed in April by the greatest mortality from erysipelas. The annual isothermals of 48° and 52° cross the Middle States—the latter, however, being as far south as the neighborhood of Philadelphia, but nearer to Harrisburg, Pennsylvania.

Let us now turn to the more genial and warmer climes of the ever "Sunny South," to Maryland.

MARYLAND.—Lying between latitudes 38° and 40°, and extending from longitude 75° to almost 80° west from Greenwich, at its

northern boundary, is the State of Maryland, with a population, according to the last census, of 780,894 souls. The state is split in two, as it were, by the Chesapeake Bay, which separates it into two portions, known as the "Eastern" and "Western Shores." According to Dr. Wroth,\* "The region known as the Eastern Shore of Maryland is bounded on the north by Mason and Dixon's line, on the east by the State of Delaware, on the west by the Susquehanna river and the Chesapeake Bay, and on the south by Accomack county, in Virginia. It embraces the counties of Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Somerset, and Worcester." At what is known as the "Peninsula," from the town of Warwick (Cecil county), extends the level, swampy lands known as the "Forest"—in fact, this whole "Eastern Shore" has no considerable elevation above the level of the sea at any point, as a hypsometric sketch of the state would show. The equability of temperature for this latitude is charming. It has been said, that in forty years the snow-fall has not reached an average of six inches annually (Wroth). Dr. Waters,† of Baltimore, gives a description of the "Western Shore" counties, as, for instance, Frederick, Carroll, Harford, and Baltimore counties. From him we learn, "That portion of it which forms the shore of Chesapeake Bay is but little elevated. As it recedes westwardly, the land rises until it reaches a height of about three hundred feet above tide-water," etc., etc. No epidemics of either erysipelas or puerperal fever are spoken of in this report. Speaking of bilious endemic fever, our writer remarks: "Many more cases, however, occur in winter and spring; and the pneumonia and *erysipelas* of those seasons are accompanied by a *typhous* grade of fever;" from whence we should judge that erysipelas is not an uncommon complaint in Maryland. At Baltimore (latitude 39° 18', longitude 76° 36', altitude 80 feet above the sea-level), according to Blodgett, the mean monthly temperature reads as follows: January, 30.9°; February, 33°; March, 39.2°; April, 52.1°; May, 60.6°; June, 70.9°; July, 75.2°; August, 74.7°; September, 66.6°; October,

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\* Report on the Medical Topography of the Eastern Shore of Maryland. By P. Wroth, M. D. Transactions of the American Medical Association, Vol. IX, 1856, p. 566 et seq.

† Report on the Medical Topography and Epidemics of Maryland. By E. G. Waters, M. D., Baltimore. Transactions of the American Medical Association, Vol. X, 1857, p. 55 et seq.

54.9°; November, 44.3°; December, 34.4°. At Frederick (latitude 39° 24', longitude 77° 18', and altitude of 700 feet above sea-level), as follows: January, 32.8°; February, 32°; March, 39.8°; April, 52.6°; May, 65.2°; June, 72.4°; July, 79.9°; August, 74.8°; September, 69°; October, 53.6°; November, 44.5°; December, 33.3°. At Annapolis, (latitude 38° 58', longitude 76° 27', altitude 20 feet above the sea-level), as follows: January, 32.3°; February, 35.4°; March, 42.8°; April, 54.1°; May, 64.5°; June, 72.7°; July, 77.2°; August, 76.1°; September, 68.8°; October, 57.6°; November, 46.8°; December, 36.7°. These stations I have selected to show the various climates of the state by seasons and annually. They read as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Baltimore.....	50.6°	73.6°	55.3°	32.8°	53.6°
Frederick.....	52.5	75.7	55.7	32.7	54.1
Annapolis.....	53.8	75.3	57.8	34.8	55.4

At Baltimore the fall of rain and melted snow by seasons is as follows: Spring, 9.56; summer, 11.81; autumn, 10.63; winter, 8.98—year, 40.98 English inches.

*Study of the Table.*—Out of a total population of 780,894, sixty-three persons died, in Maryland, in 1870, from erysipelas alone. During the same time 19 persons died from puerperal fever. As regards sex, the decedents from erysipelas consisted of 29 males and 34 females, of whom the nativity of one was unknown; 60 were native born (53 whites and 7 colored), and 2 foreign born. Of the decedents from puerperal fever, 17 were native born (16 whites, 1 colored), and 2 foreign born. The season of greatest mortality from erysipelas was spring (22). The season of greatest mortality from puerperal fever was spring (8). The month of greatest mortality from erysipelas was February (8). The month of greatest mortality from puerperal fever was April (5).

*Reflections.*—In proportion to population there seems to have been no excessive mortality from either disease in Maryland, as compared with states before named of about the same population. Maryland has a colored population of 175,391 (85,123 males, 90,268 females). On a rough calculation, then, not quite one-fifth the total population is colored; from whence we see that the mortality from both diseases is much greater in Maryland amongst the white population. Maryland has a foreign-born population of 83,412 (42,748 males and 40,664 females). Roughly calculating this at less than one-tenth the total population, we see

that the foreign born suffer much less from erysipelas than the native born, and that they suffer to about the same degree, in proportion to population, as the native born from puerperal fever. The large city of Baltimore no doubt is accountable for the most of the mortality in this state.

Let us now turn to the "Old Dominion."

VIRGINIA.—Lying between the latitudes of about  $36^{\circ} 30'$  and  $39^{\circ} 30'$ , and extending from longitude  $76^{\circ}$  to about  $83^{\circ}$  west from Greenwich at its southern boundary, is the State of Virginia.

According to Mitchell, "The Blue Ridge and Alleghany Mountains extend through the middle of the state in a northeast and southwest direction." Looking at a hypsometric sketch of the state, we see it gradually rising from a sea-level, on the Atlantic coast, to 400 feet or more; then to 600 or 700 feet toward the center of the state; and finally, to an altitude of several thousand feet in the western or mountainous portion of the state.

According to Blodgett, at Alexandria (Fairfax county), in the northeastern part of the state (latitude  $38^{\circ} 50'$ , longitude  $77^{\circ} 10'$ , altitude 50 feet above the sea-level), the monthly temperature reads as follows: January,  $31.5^{\circ}$ ; February,  $34.3^{\circ}$ ; March,  $43.4^{\circ}$ ; April,  $53.7^{\circ}$ ; May,  $65.3^{\circ}$ ; June,  $73.8^{\circ}$ ; July,  $78.6^{\circ}$ ; August,  $76^{\circ}$ ; September,  $67.9^{\circ}$ ; October,  $53.8^{\circ}$ ; November,  $47^{\circ}$ ; December,  $35.2^{\circ}$ . At Charlottesville, near the northern center of the state (latitude  $38^{\circ} 12'$ , longitude  $78^{\circ} 23'$ , altitude 150 feet above the sea-level): January,  $40.8^{\circ}$ ; February,  $43.1^{\circ}$ ; March,  $46.5^{\circ}$ ; April,  $52.4^{\circ}$ ; May,  $59.5^{\circ}$ ; June,  $72.2^{\circ}$ ; July,  $76.3^{\circ}$ ; August,  $74.3^{\circ}$ ; September,  $65.2^{\circ}$ ; October,  $60.2^{\circ}$ ; November,  $48.3^{\circ}$ ; December,  $39.2^{\circ}$ . At Lewisburg (latitude  $37^{\circ} 49'$ , longitude  $80^{\circ} 28'$ , altitude 1,800 feet above sea-level), in West Virginia, and near the state line, as follows: January,  $35.4^{\circ}$ ; February,  $34.2^{\circ}$ ; March,  $44.4^{\circ}$ ; April,  $53.8^{\circ}$ ; May,  $64.9^{\circ}$ ; June,  $69^{\circ}$ ; July,  $77.1^{\circ}$ ; August,  $73.9^{\circ}$ ; September,  $68.8^{\circ}$ ; October,  $53.5^{\circ}$ ; November,  $45^{\circ}$ ; December,  $35.4^{\circ}$ . At Millersburg, in Southwestern Virginia (latitude  $37^{\circ} 05'$ , longitude  $81^{\circ} 40'$ , altitude 150 above the sea-level, as follows: January,  $32.9^{\circ}$ ; February,  $43.2^{\circ}$ ; March,  $46.4^{\circ}$ ; April,  $61.2^{\circ}$ ; May,  $66.2^{\circ}$ ; June,  $77.9^{\circ}$ ; July,  $82.2^{\circ}$ ; August,  $78.1^{\circ}$ ; September,  $70.9^{\circ}$ ; October,  $57.2^{\circ}$ ; November,  $44.8^{\circ}$ ; December,  $38.3^{\circ}$ . These stations, reading by seasons and annually, may be thus arranged in the same manner as I have arranged the preceding ones, to wit:

## ERYSIPELAS, ETC., IN THE STATES.

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Lewisburg.....	54.4°	73.3°	55.8°	35°	54.6°
Alexandria.....	54.1	76.2	56.2	33.7	55
Charlottesville.....	52.8	74.3	57.9	37.7	55.7
Millersburg.....	58.1	79.4	57.6	38.2	58.3

The fall of rain and melted snow, by seasons, in the northeastern and southeastern parts of the state, is as follows :

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Alexandria.....	8.59	11.18	8.13	8.00	36.30
Norfolk.....	9.77	15.08	10.16	10.17	45.18

All in English inches.

*Study of the Table.*—Out of a total population of 1,225,163, Virginia suffered a mortality of 73, from the single cause of erysipelas, during the census year 1870. During the same period 69 women died of puerperal fever. As regards sex, 34 of the decedents from erysipelas were males and 39 females; 72 were native born (54 whites and 18 colored), and one was a foreigner (German). All the decedents from puerperal fever were native born (46 whites, 23 colored). The season of greatest mortality from erysipelas was spring (24). The season of greatest mortality from puerperal fever was spring (28). The month of greatest mortality from erysipelas was May (9). The month of greatest mortality from puerperal fever was May (12).

*Reflections.*—The two diseases appear to have been most prevalent about the same time; but no epidemic could have occurred. In proportion to population, the mortality from erysipelas seems not to have been as great as in colder latitudes—New England, for instance; while, on the contrary, deaths from puerperal fever seem to be more common in Virginia than in Massachusetts. Virginia has a total colored population of 512,841 (248,228 males and 264,613 females); from whence it will be seen that the mortality from both diseases is greater among the white population than among the colored. The foreign population of the state is only 13,701 (7,984 males and 5,717 females). The erysipelas epidemic of 1844–45 reached Southern Virginia (Drake). Richmond undoubtedly contributes a large share to the mortality list of the two diseases under discussion.

Now turn we to the “Good Old North Carolina State.”

NORTH CAROLINA.—Dr. Dickson,\* in his elaborate memoir, says: "The State of North Carolina, embracing an area of more than fifty thousand square miles, extending from  $34^{\circ}$  to  $36^{\circ} 30'$  of north latitude, and from longitude  $1^{\circ} 30'$  east to  $7^{\circ}$  west of Washington, and from the Atlantic ocean on the east to the Alleghany Mountains on the west, would seem to possess a sufficiently wide range of geological, meteorological, and climatic conditions to give origin to no inconsiderable variety of diseases." "On the eastern or Atlantic border of the state there is an extensive region of low, swampy, alluvial formation, but little elevated above the level of the ocean, which, as the country recedes from the coast, merges into a wide, flat sandy region of somewhat higher level, covered with extensive forests of pine, and gradually increasing in elevation until the head of navigation of its principal rivers is reached, when the face of the country becomes rolling and hilly and the pine forests abruptly disappear," etc., etc. "The mountainous region of the state, as indicated by recent surveys, embraces the highest elevation of any portion of North America east of the Rocky Mountains," etc. "Another remarkable peculiarity of this mountain region of the State of North Carolina is the existence of a belt or zone which is characterized by an entire exemption from frost. Frost occurs both above and below this remarkable zone, and the strange spectacle is sometimes presented of vegetation blighted by frost both at the base and apex of the mountain, while the intermediate region presents to the eye the blooming verdure of spring. Here fruit falling from the tree needs no protection during the winter; here the vine flourishes in great perfection," etc., etc. A hypsometric sketch of the state shows the eastern portion to have an elevation varying from a few feet to 300 or 400; a central portion from 400 to 800 feet, and a western portion from 1,000 to 2,000 feet above the sea-level. The highest ground is Mount Buckley, which is 6,775 feet in height, being the tallest peak east of the Mississippi river.

According to Blodgett, the mean monthly temperature at Beaufort (latitude  $34^{\circ} 41'$ , longitude  $76^{\circ} 40'$ , altitude 20 feet above the sea-level), on the Pamlico river, not far from the sea-coast, reads as follows: January,  $45.2^{\circ}$ ; February,  $44.1^{\circ}$ ; March,  $49.5^{\circ}$ ; April,  $60^{\circ}$ ; May,  $68.9^{\circ}$ ; June,  $76.9^{\circ}$ ; July,  $79.8^{\circ}$ ; August,  $78.9^{\circ}$ ; September,  $74.6^{\circ}$ ; October,  $64.4^{\circ}$ ; November,  $56.5^{\circ}$ ; December,  $48^{\circ}$ .

\* Report on the Medical Topography and Epidemics of North Carolina. By James H. Dickson, M. D. Trans. Amer. Med. Association, Vol. XIII, 1860, p. 273.

At Smithville, in the extreme southeast of the state, on the coast (latitude 34°, longitude 78° 05', altitude 20 feet above the sea-level), as follows: January, 49°; February, 50.5°; March, 56.3°; April, 64.2°; May, 72.8°; June, 78.9°; July, 81.5°; August, 80.2°; September, 76°; October, 67.1°; November, 59.2°; December, 52.2°. At Chapel Hill, in the northern center of the state (latitude 35° 54', longitude 79° 17', altitude 570 feet above the sea-level), as follows: January, 41.5°; February, 43.7°; March, 51.1°; April, 59.5°; May, 67.3°; June, 74.7°; July, 78.2°; August, 75.9°; September, 70.5°; October, 59.4°; November, 51°; December, 43.3°. Reading by seasons, they may be arranged as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Chapel Hill.....	59.3°	76.3°	60.3°	42.8°	59.7°
Beaufort.....	59.5	78.5	65.2	45.7	62.2
Smithville.....	64.5	80.2	67.4	50.6	65.7

The mean fall of rain and melted snow at Fort Johnson\* was as follows: Spring, 6.83; summer, 15.52; autumn, 16.32; winter, 7.34; year, 46.01—all in English inches.

*Study of the Table.*—Out of a total population of 1,071,351, the mortality from the single cause of erysipelas alone in North Carolina, in the census year 1870, was 52. During the same period 52 women perished from puerperal fever. As to sex, the decedents from erysipelas numbered 24 males and 28 females, all of whom were native born, 45 being white and 7 colored. The decedents from puerperal fever were also all native born, 35 being white and 17 colored. The season of greatest mortality from erysipelas was summer (16). The season of greatest mortality from puerperal fever was winter (18). The month of greatest mortality from erysipelas was August (8). The month of greatest mortality from puerperal fever was February (9).

*Reflections.*—In proportion to population the mortality from erysipelas is less than in New England latitudes, but the mortality from puerperal fever is more. No extensive epidemic of either disease could have occurred, and no connection could possibly have existed between the two diseases, as the season of greatest mortality from puerperal fever was the season of least mortality from erysipelas. North Carolina has a colored population of 391,650 (192,418 males and 199,232 females). This would be in the neighborhood of one-third the total population; from whence we

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\* Government Report, loc. cit.

see that erysipelas was most fatal to the white population, and that puerperal fever was as fatal among the colored population as among the whites. Epidemics of erysipelas are far from being uncommon in North Carolina, and the disease has been several times noticed as a complication of catarrhal fever and cerebro-spinal meningitis. Dr. J. J. Summerwell (quoted by Dickson) says: "An occasional case of cerebro-spinal meningitis I have now and then seen, during my whole professional career (of fifteen years); but only during the spring of 1856 have I observed this disease to assume anything of an epidemic character. At that time, however, during the months of March and April more especially, there was a great prevalence of what we had been accustomed to call *catarrhal fever*," etc., etc. "The manifestation of disease on the skin was unmistakably erysipelatous in its character, and gives a satisfactory clue to the nature of the epidemic. A large proportion of the cases terminated with a slight erysipelatous eruption on the face," etc., etc. The doctor then goes on to speak of how the more serious cases were affected: "In these were developed all the leading symptoms of cerebro-spinal meningitis," etc., etc. "Cerebro-spinal meningitis, occurring under the most favorable circumstances, is a very fatal disease; but, as it presented itself in this epidemic, not one well-marked and well-authenticated case recovered out of some twenty cases occurring in the practice of physicians of Salisbury." Dr. Dickson himself then goes on to state that, "Since the year 1856 erysipelas has prevailed more extensively in Rowan and Cabarrus counties than was ever known before; but cases of cerebro-spinal meningitis in any way connected with it have seldom occurred, but whenever it has supervened in erysipelas it has been alike fatal—proving an opprobrium to the healing art," etc., etc. "The question of why this form of inflammation of the brain should be so much more fatal than the ordinary epidemics of cerebro-spinal meningitis, as they have prevailed in this country and in Europe, which are described in books, finds, in my mind, a satisfactory answer in the nature of erysipelatous inflammation," etc. It is significant, in this connection, that no reference is made to puerperal fever. The natural query would be, Why was not an increase of puerperal fever noted during this epidemic? Here evidently the two diseases did not prevail at the same time.

We now turn to South Carolina.

**SOUTH CAROLINA.**—This state has found an able medical histori-

ographer in Dr. Manning Simons,\* of Charleston. It is from this gentleman's report that we cull the following extract: "Wedged in between North Carolina on the north and northeast, and Georgia on the west, it is bounded on two sides of the triangle which constitutes its figure by water—the Atlantic ocean on the east and southeast, and the Savannah river on the west. It lies between 30° 4' 30" and 35° 12' north latitude, and 78° 25' and 83° 40' west longitude from Greenwich, and covers an area of about 30,000 square miles. The physical features of the country vary with the proximity or distance from the coast of the different sections. Passing from the coast line north-northwest, the country is flat, and rises in an almost evenly gradual ascent until the mountains are reached, when a height of 3,000 or 4,000 feet is attained at their highest point." Dr. Simons refers to no epidemics of erysipelas or puerperal fever occurring in the state.

According to Blodgett, the mean monthly temperature at various points in the state reads as follows: At Camden (latitude 34° 17', longitude 80° 33', altitude 275 feet above the sea-level): January, 45.1°; February, 48.5°; March, 56°; April, 61.5°; May, 71.4°; June, 76.4°; July, 80.5°; August, 78.4°; September, 74.3°; October, 61.8°; November, 52.6°; December, 46.3°. At Charleston (latitude 32° 45', longitude 79° 51', altitude 20 feet above sea-level): January, 50.3°; February, 52.4°; March, 58.7°; April, 65.4°; May, 73.4°; June, 79°; July, 81.7°; August, 80.9°; September, 76.9°; October, 67.9°; November, 59.5°; December, 52.5°. Reading these two stations by seasons, it would be thus:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Camden . . . . .	63°	78.4°	62.9°	46.6°	62.7°
Charleston . . . . .	65.8	80.6	68.1	51.7	66.6

The annual fall of rain at Charleston in seasons reads about as follows: Spring, 8.60; summer, 18.68; autumn, 11.61; winter, 9.40; year, 48.29, in English inches.

*Study of the Table.*—Out of a total population of 705,606, the decedents from erysipelas in the census year 1870, in South Carolina, numbered 21. During the same period 15 women died from puerperal fever. As regards sex, the decedents from erysipelas were males, 11; females, 10; of these 20 were native born (11 white, 9 colored), and 1 French. All the decedents from puer-

\* Report on the Climatology and Epidemics of South Carolina. By Manning Simons, M. D., Charleston, South Carolina. Transactions of the American Medical Association, Vol. XXIII, 1872, p. 275 et seq.

peral fever were native born (3 white and 12 colored). The season of greatest mortality from erysipelas was winter (8). The season of greatest mortality from puerperal fever was spring (8). The month of greatest mortality from erysipelas was May (4). The months of greatest mortality from puerperal fever were January, March, and April (each 3).

*Reflections.*—In proportion to population, the mortality from both diseases seems to be less in South Carolina as compared with the Southern States heretofore given. 281,894 of the population of South Carolina are colored; of these 136,275 are males and 145,619 are females. This is more than one-third the entire population. From this it will be seen that far more blacks than whites, in proportion to population, died of both diseases. The foreign population, as in the case of North Carolina, is so small that no mention need be made to it at this point. I shall, however, dwell on the prevalence of both diseases among the whites and blacks, and among the native-born and foreign-born populations, in my final summary and conclusions.

And next appears Georgia.

GEORGIA.—Lying mostly between  $30^{\circ} 30'$  and  $35^{\circ}$  north latitude, and extending from  $81^{\circ}$  to almost  $86^{\circ}$  longitude west from Greenwich, is the State of Georgia. A hypsometric sketch of the state shows that most of it has an altitude of less than 400 feet above the sea-level. In the northwestern part of the state the land becomes higher in the neighborhood of Atlanta, in the mountainous part of the state. At Savannah, on the coast (mouth of Savannah river), in Southeastern Georgia (latitude  $32^{\circ} 05'$ , longitude  $81^{\circ} 7'$ , altitude 45 feet above sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January,  $52.2^{\circ}$ ; February,  $54.5^{\circ}$ ; March,  $60.4^{\circ}$ ; April,  $67.7^{\circ}$ ; May,  $74.8^{\circ}$ ; June,  $79.6^{\circ}$ ; July,  $81.9^{\circ}$ ; August  $81.2^{\circ}$ ; September,  $76.9^{\circ}$ ; October,  $67.2^{\circ}$ ; November,  $58.6^{\circ}$ ; December,  $51.5^{\circ}$ . At Augusta (latitude  $33^{\circ} 28'$ , longitude  $81^{\circ} 53'$ , altitude 550 feet above the sea-level), as follows: January,  $46.7^{\circ}$ ; February,  $50.7^{\circ}$ ; March,  $55.8^{\circ}$ ; April,  $65.1^{\circ}$ ; May,  $72.2^{\circ}$ ; June,  $79^{\circ}$ ; July,  $81.9^{\circ}$ ; August,  $79.7^{\circ}$ ; September,  $72.8^{\circ}$ ; October,  $63.5^{\circ}$ ; November,  $53.8^{\circ}$ ; December,  $46.8^{\circ}$ . At Sparta (latitude  $33^{\circ} 17'$ , longitude  $83^{\circ} 9'$ , altitude 550 feet above sea-level), as follows: January,  $46.3^{\circ}$ ; February,  $45.2^{\circ}$ ; March,  $56.7^{\circ}$ ; April,  $61.7^{\circ}$ ; May,  $72.3^{\circ}$ ; June,  $76.2^{\circ}$ ; July,  $81.6^{\circ}$ ; August,  $79.6^{\circ}$ ; September,  $76.3^{\circ}$ ; October,  $61.2^{\circ}$ ; November,  $54.9^{\circ}$ ; December,  $45^{\circ}$ . The reading of the temperature by seasons would then be thus:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Sparta .....	63.4°	79.1°	66.1°	45.5°	63.1°
Augusta.....	64.4	80.2	63.4	48.1	64
Savannah.....	67.6	80.9	67.6	52.7	67.2

The rain-fall at the different seasons, in the city of Savannah, averages as follows: Spring, 11 inches; summer, 20.72; autumn, 8.46; winter, 8.48—giving a total annual average fall of 48.66 English inches.

Dr. Posey,\* who has written an able article regarding the epidemics of Georgia, remarks: "Puerperal fever is sometimes, for a few months, much more prevalent than at others. I do not, however, believe it has occurred as a true epidemic disease." In another place, the doctor says: "Scarlatina, rubeola, varicella, pertussis, parotitis, *erysipelas*, dysentery, and some other diseases of minor importance have prevailed as epidemics, at uncertain intervals of time, in the whole of the primitive division of the state."

*Study of the Table.*—Out of a total population of 1,184,109, the mortality from erysipelas, in Georgia, in 1870, was 38. During the same time 76 women died from puerperal fever. As regards sex, the decedents from erysipelas numbered 12 males and 26 females, all of whom were native born (32 being white and 6 colored). Of the decedents from puerperal fever, the nativity of one was unknown, 75 were native born (*i. e.* 46 whites and 29 colored). The season of greatest mortality from erysipelas was spring (12). The season of greatest mortality from puerperal fever was spring (34). The mortality from erysipelas was the same at several different months it will be noticed. The month of greatest mortality from puerperal fever was April (13).

*Reflections.*—It looks as though there might have been a slight epidemic tendency to puerperal fever in the spring of the census year 1870; for the largely increased mortality about that time will be observed—however, in proportion to population, the mortality from puerperal fever is not so very great after all. Georgia has a colored population of 545,142 (267,765 males and 277,377 females). It will be seen, from this statement, that almost half the population is colored. The preponderance of mortality from both diseases among the whites will be at once seen.

We shall now turn to the consideration of Florida.

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\* Report upon the Topography and Epidemic Diseases of the State of Georgia. By John F. Posey, M. D., Savannah. Trans. Amer. Med. Association, Vol. X, 1857, p. 140 et seq.

FLORIDA.—That beautiful land, where the eternal kiss of a summer's balmy sunshine lingers on the lips of a warm, tropical nature, scented with the breath of incense-breathing exotics, musical with the tintinnulations of richly-plumaged warblers. Land of lazy, tremulous languors, where the weary invalid convalesces, while dreaming the time away in a delicious *dolce far niente* state! If Ponce de Leon did not carry back with him to "Old Andalusia" any of the waters of the fabled Fountain of Youth, he must, at least, have taken a new lease of life during his short sojourn amidst your blossoming orange-groves!

Extending from the 25th to the 35th degree of north latitude, and from the 80th to the 88th degree of longitude west of Greenwich at its northern border, the State of Florida dips southward and separates the waters of the Atlantic from the Gulf of Mexico. A hypsometric sketch of the state shows, that at no point does it reach an altitude of 400 feet above the sea-level. The mean monthly temperature at different points I have selected, according to Blodgett, reads as follows: At Jacksonville, on the St. Johns river (latitude  $30^{\circ} 15'$ , longitude  $82^{\circ}$ , altitude above sea-level of 14 feet): January,  $56.4^{\circ}$ ; February,  $56.1^{\circ}$ ; March,  $64.2^{\circ}$ ; April,  $67.8^{\circ}$ ; May,  $76.4^{\circ}$ ; June,  $79.4^{\circ}$ ; July,  $82.3^{\circ}$ ; August,  $82.4^{\circ}$ ; September,  $80.7^{\circ}$ ; October,  $68.7^{\circ}$ ; November,  $64.1^{\circ}$ ; December,  $54.2^{\circ}$ . At St. Augustine, on the coast, and farther south (latitude  $29^{\circ} 48'$ , longitude  $81^{\circ} 35'$ , altitude 20 feet above the sea-level): January,  $57^{\circ}$ ; February,  $59.9^{\circ}$ ; March,  $63.3^{\circ}$ ; April,  $68.8^{\circ}$ ; May,  $73.5^{\circ}$ ; June,  $79.3^{\circ}$ ; July,  $80.9^{\circ}$ ; August,  $80.5^{\circ}$ ; September,  $78.6^{\circ}$ ; October,  $71.9^{\circ}$ ; November,  $64.1^{\circ}$ ; December,  $57.2^{\circ}$ . At Key West, one of the chain of small islets at the extreme southern territory of the United States (latitude  $24^{\circ} 32'$ , longitude  $81^{\circ} 48'$ , altitude 7 feet above the sea-level), as follows: January,  $69.5^{\circ}$ ; February,  $70^{\circ}$ ; March,  $72.6^{\circ}$ ; April,  $75.2^{\circ}$ ; May,  $78.9^{\circ}$ ; June,  $81.2^{\circ}$ ; July,  $82.5^{\circ}$ ; August,  $82.7^{\circ}$ ; September,  $81.3^{\circ}$ ; October,  $77.4^{\circ}$ ; November,  $74.7^{\circ}$ ; December,  $70.5^{\circ}$ . The reading, by seasons, at these different points, can then be arranged thus, as in the following table:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Jacksonville .....	69.5°	81.4°	71.2°	55.6°	69.4°
St. Augustine.....	68.5	80.3	71.5	58.1	69.6
Key West.....	75.6	82.1	77.8	70	76.4

The fall of rain, at St. Augustine, for the different seasons, reads

as follows: Spring, 5.90; summer, 10.54; autumn, 9.56; winter, 5.80; or a total annual rain-fall of 31.80 inches.

I have been unable to find any special work regarding the epidemics of Florida.

*Study of the Table.*—Out of a total population of 187,748, the mortality from erysipelas in the State of Florida (1870) was 9. During the same time 5 women died of puerperal fever. As regards sex, the decedents from erysipelas were 5 males and 4 females, all native born (7 whites, 2 colored). The decedents from puerperal fever were all native born (3 whites, 2 colored). Autumn and winter were the seasons of greatest mortality from erysipelas (3 each). Winter the season of greatest mortality from puerperal fever (2.) Months of greatest mortality from erysipelas, June and September (2 each). The deaths from puerperal fever were never more than one in any month.

*Reflections.*—Florida has a total population, as before stated, of 187,748 souls. In proportion to population, the mortality from erysipelas is greater than in any of the Southern States hitherto enumerated, while the mortality from puerperal fever is less than some—Georgia for instance. The colored population of Florida numbers 91,689 (45,594 males and 46,095 females), or almost one-half the population; from whence it will be seen that the mortality from both diseases was less, in proportion to population, among the whites than among the blacks.

We shall now look into Alabama.

ALABAMA.—Lying between the 30th and 35th parallels of north latitude, and extending from 85° to about 88° 30' longitude west of Greenwich, is the State of Alabama. A hypsometric sketch of the state shows it to be almost wholly less than 400 feet above a sea-level. In northeastern Alabama, however, the state is decidedly mountainous, and reaches an altitude of from 800 to 1,500 feet near the town of New London.

At Erie, Greene county, in northwestern Alabama (latitude 32° 40', longitude 88°, altitude 200 feet above the sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January, 45.4°; February, 51.4°; March, 58.9°; April, 62.9°; May, 73.9°; June, 78.2°; July, 80.5°; August, 80.5°; September, 75.3°; October, 64.8°; November, 53.2°; December, 47.2°. At Mobile, at the junction of Mobile river and Mobile Bay (latitude 30° 42', longitude 87° 59', altitude 25 feet above the sea-level), in

the southwestern portion of the state: January, 57.6°; February, 57.9°; March, 62.4°; April, 70.6°; May, 77.4°; June, 81.6°; July, 83.7°; August, 82.9°; September, 80°; October, 69.5°; November, 62.6°; December, 56.3°. Reading by seasons it would be as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Erie.....	63.2°	79.7°	64.4°	51.3°	65.2°
Mobile.....	70.1	82.7	71	57.3	70.3

At Huntsville the fall of rain by seasons reads: Spring, 14.88; summer, 14.58; autumn, 9.99; winter, 15.43 inches—giving a total annual rain-fall of 54.48 English inches.

There have been epidemics of erysipelas at various times in the history of the state; as, for instance, in the spring of 1844 at Whitesbury, and again in February, 1845, at Courtland.—(Refer to Drake.)

*Study of the Table.*—Out of a total population of 996,992, the mortality in Alabama, in the census year 1879, from the single cause of erysipelas, was 51. During the same time 53 women died of puerperal fever. As regards sex, the decedents from erysipelas numbered 30 males and 21 females. These were all native born (32 being whites and 21 colored). The decedents from puerperal fever were all native born (32 whites and 21 colored). The season of greatest mortality from erysipelas was spring (17). The season of greatest mortality from puerperal fever was spring (19). The month of greatest mortality from erysipelas was March (7). The month of greatest mortality from puerperal fever was May (7).

*Reflections.*—As regards population, the mortality from both diseases is not excessive; and no epidemic of either disease could have prevailed to any great extent. Almost half the population of the state is colored, there being 475,510 persons of African descent (233,677 being males and 241,833 females). From this statement it will be seen that the mortality from both diseases is greater, in proportion to population, among the whites than among the colored.

The next state in order is Mississippi.

**MISSISSIPPI.**—Lying between the 30th and 35th parallels of north latitude, and between longitude 88° and 92° west of Greenwich, is the State of Mississippi. A hypsometric sketch of the state shows, that almost all the southern portion of it has an elevation of less

than 400 feet above the sea-level. In the northern portion of the state, however, the land becomes higher and reaches an altitude of from 800 to 1,600 feet at points.

At Natchez, in southwestern Mississippi (latitude  $31^{\circ} 34'$ , longitude  $91^{\circ} 28'$ , altitude 246 feet above the sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January,  $52.3^{\circ}$ ; February,  $54.5^{\circ}$ ; March,  $59.7^{\circ}$ ; April,  $69.8^{\circ}$ ; May,  $74.5^{\circ}$ ; June,  $80.8^{\circ}$ ; July,  $81.3^{\circ}$ ; August,  $80.9^{\circ}$ ; September,  $77.2^{\circ}$ ; October,  $67^{\circ}$ ; November,  $57^{\circ}$ ; December,  $49.7^{\circ}$ ; or a mean temperature by seasons as follows: Spring,  $68^{\circ}$ ; summer,  $81^{\circ}$ ; autumn,  $67.1^{\circ}$ ; winter,  $52.2^{\circ}$ ; or an annual mean temperature of  $67.1^{\circ}$ . At Natchez there is a rain-fall of 14.92 inches in spring, 13.06 in summer, 13.33 in autumn, 16.44 in winter, or a total average rain-fall of 57.75 English inches per annum.

Epidemics of erysipelas have occurred in Mississippi, from time to time; and records are extant of one in 1843-44, in the valley of the Big Black, at Jackson, Vicksburg, Warrenton, Grand Gulf, and Port Gibson; again, in 1848-49, it prevailed as an epidemic near Vicksburg during the winter-time.—(Refer to Drake.)

*Study of the Table.*—Out of a total population of 827,922 persons, 36 died from the single cause of erysipelas, in the census year 1870, in the State of Mississippi. During the same time 45 women died from puerperal fever. As regards sex, the decedents from erysipelas numbered 20 males and 16 females. Of these 34 were native born (28 whites and 6 colored), while 2 were foreigners. Of the decedents from puerperal fever, 44 were native born (24 whites and 20 colored), and 1 was a foreigner. The season of greatest mortality from erysipelas was spring (14). The season of greatest mortality from puerperal fever was spring (22). The month of greatest mortality from erysipelas was May (7). The month of greatest mortality from puerperal fever, May (9).

*Reflections.*—The decrease in the mortality rate of erysipelas, and the increase in that of puerperal fever, as we reach the warmer latitudes of the far Southern States, will have no doubt been already observed. We see that in Mississippi both diseases were most prevalent, at the same time, in 1870, and that at the same time no extraordinary epidemic tendency to either disease could have existed. The colored population of Mississippi numbers 444,201 (of whom 217,722 are males and 226,479 females). From this statement it will be seen at a glance, that the white

population, embracing less than one-half the total population, suffers more in proportion than the colored population from both diseases.

We now turn to Louisiana.

LOUISIANA.—Stretching from the 29th to the 33d parallel of north latitude, and lying mostly between longitude 89° to 94° west of Greenwich, is the State of Louisiana. A hypsometric sketch of the state shows, that at no point does it reach an altitude of 400 feet above the sea-level; in fact, most of the state is very low and swampy, and after a rise in the Mississippi or its tributaries, it is not unfrequently the case that vast areas of land are submerged and turned for the time being into swamps.

The mean monthly temperature at various points selected, according to Blodgett, reads as follows: At the Delta of the Mississippi (latitude 29° 25', longitude 89° 30', no altitude), as follows: January, 59.5°; February, 60.1°; March, 62.4°; April, 72.9°; May, 77°; June, 82°; July, 82.9°; August, 81.5°; September, 80.5°; October, 73°; November, 63°; December, 59°. At New Orleans, Orleans parish, on the Mississippi river (latitude 29° 57', longitude 90°, altitude 10 feet above the sea-level): January, 54.4°; February, 54.5°; March, 61.6°; April, 67.8°; May, 74°; June, 78.7°; July, 80.4°; August, 79.7°; September, 77.1°; October, 69°; November, 58°; December, 56°. At Natchitoches, in central Louisiana (latitude 33° 33', longitude 93° 32', altitude 100 feet above the sea-level): January, 50.6°; February, 52.7°; March, 59.4°; April, 67.4°; May, 73.7°; June, 80.2°; July, 82.2°; August, 81.3°; September, 76.1°; October, 65.9°; November, 56.7°; December, 49.7°. By seasons, thus:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Delta of Miss.....	70.8°	82.1°	72.2°	59.5°	71.2°
New Orleans.....	67.8	79.6	68	55	67.6
Natchitoches .....	66.8	81.3	66.2	51	66.3

The mean annual rain-fall and the rain-fall by seasons read as follows, at New Orleans: Spring, 13.26; summer, 16.11; autumn, 10.79; winter, 12.15—giving an annual mean of 52.31 English inches.

Epidemics of erysipelas have occurred in Louisiana. Drake makes mention of one having occurred at La Charité Hospital, New Orleans, in the winter of 1848-49.

*Study of the Table.*—Out of a total population of 726,915 persons, the mortality from the single cause of erysipelas, in the State

of Louisiana, during the census year of 1870, was 52. Within the same period, 24 women died from puerperal fever. Regarding sex, the decedents from erysipelas numbered 21 males and 31 females. Of these, the nativity of 1 was unknown; 45 were native born (35 whites, 10 colored), and 6 were foreigners. Of the decedents from puerperal fever, 20 were native born (11 whites and 9 colored), and 4 were foreigners. The season of greatest mortality from erysipelas was winter (17). The season of greatest mortality from puerperal fever, spring (9). The months of greatest mortality from erysipelas, May and September (each 8). Month of greatest mortality from puerperal fever, March (4).

*Reflections.*—Louisiana has a colored population of 364,210 souls (178,784 males and 185,426 females); from whence it will be seen that more whites die from both diseases, in proportion to population, than do colored persons. The fact that the populous city of New Orleans is in Louisiana, probably accounts for the increased mortality rate from erysipelas and puerperal fever in that state as compared with other Southern States heretofore under discussion. Louisiana has also a foreign-born population of over 60,000 persons.

Texas being the next state in order, we shall now look into the heavy mortality existing there.

**TEXAS.**—Extending from  $26^{\circ}$  to about  $36^{\circ} 30'$  of north latitude, and lying between  $94^{\circ}$  and  $107^{\circ}$  longitude west of Greenwich, is the "Lone Star State." A hypsometric sketch of the state shows, that along the coast-line on the Gulf of Mexico, the state has an elevation of less than 400 feet above the sea-level. The country becomes higher in the central portion of the state, reaching an altitude of 1,000 feet or so. In western and northwestern Texas the country becomes hilly and even mountainous, and reaches an altitude of 2,000 feet or more above tide-water.

At Galveston, on the coast (latitude  $29^{\circ} 18'$ , longitude  $94^{\circ} 46'$ , altitude 0), the monthly temperature, according to Blodgett, reads as follows: January,  $48.1^{\circ}$ ; February,  $58^{\circ}$ ; March,  $63.5^{\circ}$ ; April,  $70^{\circ}$ ; May,  $78.7^{\circ}$ ; June,  $80.7^{\circ}$ ; July,  $83^{\circ}$ ; August,  $83.3^{\circ}$ ; September,  $78.3^{\circ}$ ; October,  $73.1^{\circ}$ ; November,  $60.2^{\circ}$ ; December,  $55.6^{\circ}$ . At Corpus Christi, farther south (latitude  $27^{\circ} 07'$ , longitude  $97^{\circ} 27'$ , altitude 0): January,  $56.3^{\circ}$ ; February,  $57^{\circ}$ ; March,  $66.6^{\circ}$ ; April,  $69.8^{\circ}$ ; May,  $77.9^{\circ}$ ; June,  $82^{\circ}$ ; July,  $82.5^{\circ}$ ; August,  $83.1^{\circ}$ ; September,  $81^{\circ}$ ; October,  $73.4^{\circ}$ ; November,  $64.9^{\circ}$ ; December,  $56.9^{\circ}$ .

It will thus be seen that the temperature, arranged by seasons, would read as follows :

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Galveston.....	71°	82.5°	70.2°	53.8°	69.4°
Corpus Christi....	71.4	82.5	73.1	56.7	70.9

At Matamoras, on the Rio Grande river, and at the extreme southern part of the state, on the Mexican frontier, the fall of rain, at the different seasons of the year, reads as follows : Spring, 3.97 inches ; summer, 10.20 ; autumn, 15.75 ; winter, 5.25—giving a total yearly rain-fall of 35.17 English inches.

*Study of the Table.*—Out of a total population of 818,579, there died, from the single cause of erysipelas, 91 persons in Texas (census year 1870). During the same period of time 86 women perished of puerperal fever. As regards sex, the decedents numbered 47 males and 44 females. Of these 89 were native born (82 whites, 7 colored), and 2 were foreigners—one being a German, and the other one came from the north of Europe. Of the decedents from puerperal fever, 81 were native born (67 whites, 14 colored), and 5 were foreigners. Of the latter, 3 were Germans—one was from Great Britain, and another was from the north of Europe. The season of greatest mortality from erysipelas was winter (26). The season of greatest mortality from puerperal fever was winter (30). The month of greatest mortality from erysipelas was January (11). The month of greatest mortality from puerperal fever was February (16).

*Reflections.*—A remarkably heavy mortality from erysipelas and puerperal fever, if we compare Texas with the balance of the Southern States heretofore enumerated. Texas had a total population of 818,579 persons in the year 1870. Of this population, 253,475 (126,278 males and 127,197 females) were colored. From this it will be seen that more whites die from both diseases, in proportion to population, than do colored persons. This fact we have noticed in all the Southern States. We have also noticed, that while erysipelas seems to carry off very few *male* negroes, the *female* colored population appears to suffer some from puerperal fever. This seems to be the case, not only in Texas, but through the whole "South." The state had a foreign-born population of over 60,000 in the last census (1870).

Let us now turn to the District of Columbia, which, although not a state, is certainly entitled to as much consideration as Rhode

Island and Delaware; that is, if we are to judge from the population. With this will be finished our "Southern States," and we shall then, after a short recapitulation, turn to the "Mighty West."

DISTRICT OF COLUMBIA.—Lying on the left bank of the river Potomac, and covering an area of about 60 square miles, is the District of Columbia. The District of Columbia contains Washington city and Georgetown within its limits; hence the heavy mortality from both diseases, which is due, no doubt, to the hospital and ordinary city influences.

Washington city (latitude  $38^{\circ} 53'$ , longitude  $77^{\circ} 2'$ , altitude 80 feet above the sea-level) has a mean monthly temperature, according to Blodgett, as follows: January,  $34.1^{\circ}$ ; February,  $36.7^{\circ}$ ; March,  $45.3^{\circ}$ ; April,  $55.7^{\circ}$ ; May,  $66.3^{\circ}$ ; June,  $74.4^{\circ}$ ; July,  $78.3^{\circ}$ ; August,  $76.3^{\circ}$ ; September,  $67.7^{\circ}$ ; October,  $56.7^{\circ}$ ; November,  $44.8^{\circ}$ ; December,  $37.3^{\circ}$ —giving a temperature, at given seasons, as follows: Spring,  $55.8^{\circ}$ ; summer,  $76.3^{\circ}$ ; autumn,  $56.4^{\circ}$ ; winter,  $36.1^{\circ}$ ; or a mean annual temperature of  $56.1^{\circ}$ . The fall of rain and melted snow, at Washington city, as given in English inches and fractions, reads as follows: Spring, 10.45; summer, 10.52; autumn, 10.16; winter, 11.07; or, yearly 41.20 inches.

*Study of the Table.*—Out of a total population of 131,700 persons in the District of Columbia (census year 1870), 13 died of erysipelas. During the same period 6 women died of puerperal fever. As regards sex, the decedents from erysipelas numbered 6 males and 7 females. Of these, all were native born (11 whites and 2 colored). Of the decedents from puerperal fever, the nativity of one was unknown, one was a German woman, and the balance were native-born whites (4). The season of greatest mortality from erysipelas was spring (4). The season of greatest mortality from puerperal fever was winter (4). The month of greatest mortality from erysipelas was March (3). The month of greatest mortality from puerperal fever was December (2).

*Reflections.*—No very evident connection seems to exist here between the two diseases, while the season of the greatest mortality from one disease preceded that of the other. Very nearly one-third the population is colored, and hence the mortality from both diseases is much greater among the whites than the blacks.

RESUME.—With the exception of Maryland, Delaware, and Virginia, which properly belong to the "Middle Atlantic States"—(Guyot)—the states just enumerated form what is known as the collection of "South Atlantic and Gulf States." According to

Guyot: "These states lie along the coast south of Chesapeake Bay. Texas and nearly all of Louisiana lie west of the Mississippi. Each state east of the Mississippi, except Florida, is crossed near the center by the ridge separating the low lands of the coast from the high lands of the mountains. The low lands, as in the former section, are either sandy or marshy. Florida and Louisiana are wholly low land. The greater part of Mississippi is also low. These sections include the warmest part of the United States, and, excepting in the northwestern part of Texas, the climate is very moist. The winter is very mild in all the states. In the southern part of Florida and Texas there are the regular rainy and dry seasons of hot countries."

*Study of the Table.*—If we now study the total mortality from both diseases, in what we have classed as the "Southern States," in the same manner as we have the other sections of the Union, we shall see the following to be the result of our recapitulation: The total number of deaths from erysipelas, in the Southern States, in 1870, was 499. During the same time 450 women died from puerperal fever. The season of greatest mortality from erysipelas, in this section of our country, was spring (151). The season of greatest mortality from puerperal fever was spring (162). The month of greatest mortality from erysipelas was May (58). The month of greatest mortality from puerperal fever was April (57).

*Reflections.*—Some curious facts will be noticed, by glancing over the total mortality of the different sections heretofore enumerated. It is seen, that in the Southern States, having more than twice the population of New England, erysipelas decreases. This fact is more marked than ever, if we take off the mortality of Virginia, Maryland, and the District of Columbia, which geographically belong to the Middle Atlantic section. Making the same calculation with regard to puerperal fever, we find it maintains its claim in the Southern States; and, in proportion to population, bears about the same relative proportion as it does to the Middle Atlantic section. To be more explicit, the following propositions are verified by the census tables of 1870:\*

1. *Erysipelas increases from the south to the north.*
2. *Puerperal fever increases from the north to the south.*

Again, *erysipelas is most prevalent where there is the least puerperal fever.* Now this is a singular fact, considering the claim is

\* These propositions refer only to the Northern Atlantic, Middle, and Gulf States.

made of an intimate connection between the two diseases. But let us still look again, and we find in the Southern States, wherever there was a large mortality from puerperal fever, there was undoubtedly *a corresponding increase in the erysipelas mortality*. Take Alabama, North Carolina, and Texas as examples of this.

The comparative immunity from both diseases of the colored population (as before noticed in the New England and Middle Atlantic sections) is again brought prominently before our eyes. The entire colored population of the United States, in 1870, was 4,880,009. Of this number 3,713,327 lived in the southern section; hence it is seen that more than three-fourth of our *entire colored population*, constituting at least two-fifths of the total population of this southern section, suffer less mortality from these causes, in proportion to population, than did the whites. A singular fact in this connection, heretofore noticed, is that *so few colored males and females die from erysipelas*, while quite a number of colored females die from puerperal fever. The link of connection shows a weak point here again.

Alabama, Texas, and Georgia, which contribute most largely to the mortality from both erysipelas and puerperal fever, in this southern section of country, also contribute *almost all the mortality from cerebro-spinal fever* during the same period. This fact can be verified if the reader will refer to an article written by myself for a former number of this journal.\*

As the foreign-born population of this section, all told, only numbers 282,045 persons, scattered all through this broad section, no especial attention will be given to them at this point.

We have now treated in detail 1,616 deaths of erysipelas and 889 deaths from puerperal fever, which occurred in our eastern, southeastern, and southern country in 1870.

We shall now turn to the deaths which occurred in the great interior valley of this continent.

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### SECTION THIRD.

#### WESTERN STATES.

We come to the study of erysipelas and puerperal fever as they appear in the younger states of the Union, in the "Great West."

A glance over an atlas of the United States will show the exact

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\* Refer to "Cincinnati Lancet and Observer," December, 1873.

geographical position of the section we now propose to discuss. On the far eastern portion, we have the Alleghany Mountains, separating eastern from western Virginia, while running through eastern Kentucky and eastern Tennessee are the Cumberland Mountains. On the north, we have the great lake region and British America. On the south, northern Texas and northern Mexico; while the western border, or Pacific coast-line, touches that great western waste of golden waters which ebbs away toward the setting sun. Spreading over an immense amount of territory, with an ever-changing climate and diversified surface, traversed at places by mighty rivers, while here and there gigantic ranges of mountains rear their snow-capped tops 10,000, 12,000, and even 13,000 feet above the sea-level. Again, we have long stretches of prairie-land, extending miles and miles, as level as a table, and destitute of forests. Again, the low country of southern California, where the changes of climate are scarcely apparent, the seasons and months merging into each other so gradually that the difference in temperature is scarcely noticed, in the eternal summer that reigns in that enchanted land. The most interesting study in this New World, whose earliest civilization dates back scarcely a century, will be that of the two diseases we have been treating. Whether these diseases follow in the wake of the emigrant, and are carried along with our white population as in a resistless tide it is borne westward, is a thing to be studied not without interest. And, in this connection, the writer wishes to remark, that he has, for some time back, had a theory that these immigrants who settle in the far West carry with them a natural constitutional predisposition to certain diseases. To be more explicit, it has been discovered lately, that in certain Norwegian settlements in Wisconsin, that leprosy has developed itself in Norwegian settlers. This taint of diathesis, if we may be allowed to use the expression, is certainly imported with the immigrant. The leprosy, it has been also said, has developed itself among Chinese settlers of California. I have myself most abundant proof that, for years back, the German population of my native city (Cincinnati) have suffered greatly, out of all proportion to population, from puerperal fever and erysipelas; not that the diseases have prevailed to any great extent, but that almost all the decedents from them were Germans by birth or descent. I shall give the figures for this statement near the close of my article. This is a most important point; for if it could be proved that the inhabitants of various countries carried

the undeveloped germs of certain diseases prevalent in their native lands along with them to far-off distant climes, a new study would be opened to us. Leprosy is common in Norway and China. Erysipelas is very common in Germany. It may be claimed that one disease is diathetic and the other zymotic; but, "What's in a name?" It is a well-known fact, that our European emigrants travel along their own isothermal lines usually, from east to west. Thus, we see the Swede and Norwegian settling in Maine, Minnesota, Wisconsin, and northern Michigan; the Englishman, Scotchman, and Irishman, taking the northern Atlantic and eastern middle section; the German going farther south, to the Central, Middle, and Southwestern States; while the Frenchman, Italian, and Spaniard seek the far Southern States, and the poor Greek is content to settle in the city of New Orleans. Seeking, thus naturally, a climate as near as possible like the one in their native land, is it strange that, having a natural predisposition to a certain kind of disease, that *even in a new country* the climatic conditions are such as to redevelop certain diseases? In such a case the climate could not be held directly responsible. In the study of the lately settled Western States, we shall look into this point as far as is possibly practicable, with the limited amount of statistics we have on hand.

Without further digressing from the immediate subject under discussion, we shall now take up the study of erysipelas and puerperal fever as they prevailed together in the "West," during 1870, and in the order in which I have arranged on the following supplementary table of Western States. We shall commence with the State of Ohio.

OHIO.—Lying between  $38^{\circ} 30'$  and  $42^{\circ}$  north latitude, and  $80^{\circ} 30'$  and  $85^{\circ}$  longitude west of Greenwich, is the State of Ohio. A hypsometric sketch of the state shows it to have an elevation of from 500 to 1,100 feet above the sea-level.

According to Blodgett, the mean monthly temperature, at various points, reads as follows: Cincinnati (latitude  $39^{\circ} 07'$ , longitude  $84^{\circ} 30'$ , altitude 550 feet above the sea-level): January,  $30^{\circ}$ ; February,  $34.4^{\circ}$ ; March,  $43.9^{\circ}$ ; April,  $57.6^{\circ}$ ; May,  $61.3^{\circ}$ ; June,  $71.2^{\circ}$ ; July,  $74.5^{\circ}$ ; August,  $73.3^{\circ}$ ; September,  $68.3^{\circ}$ ; October,  $55.1^{\circ}$ ; November,  $41.7^{\circ}$ ; December,  $34.5^{\circ}$ —thus giving a spring temperature of  $54.3^{\circ}$ ; summer,  $73^{\circ}$ ; autumn,  $55^{\circ}$ ; winter,  $32.9^{\circ}$ ; or a mean annual of  $53.8^{\circ}$ . At Hudson (latitude  $41^{\circ} 15'$ , longitude  $81^{\circ} 25'$ , altitude 1,131 feet above the sea-level): January,  $28.1^{\circ}$ ;

# tes and Territories. (CONTINUED.)

Arranged by T. C. Minor, M. D., Cincinnati, O.

Season of greatest Mortality from Erysipelas.	Month of greatest Mortality from Erysipelas.	Total Deaths from Puerperal Fever in Spring.				Season of greatest Mortality from Puerperal Fever.	Month of greatest Mortality from Puerperal Fever.	REMARKS.
		Summer.	Autumn.	Winter.	*			
Spring.	Mch. & Apr.	40	17	30	25	Spring.	March.	In Kentucky, one death from puerperal fever, month unknown, which in order to tally with the balance of the table, was placed to the credit of April. (12+1=13).
Spring.	August.	31	10	21	21	Spring.	April.	
Winter.	August.	31	10	14	27	Spring.	May.	
ummer.	December.	3	2	3	5	Winter.	February.	
Spring.	December.	10	9	7	10	Spr.&Wint.	January.	
Winter.	February.	9	5	7	10	Winter.	Dec. & July.	In Illinois, one death from puerperal fever, month unknown, which in order to tally with the balance of the table, was credited to the month of March. (25+1=26).
Winter.	February.	33	8	20	26	Spring.	March.	
Spring.	Mch. & Apr.	57	15	31	46	Spring.	March.	
Spring.	Mch. & Sep.	44	36	38	43	Spring.	Aug. & Feb.	
Autumn.	September.	15	8	14	19	Winter.	Sept. & Feb.	
Spring.	October.	15	3	7	12	Spring.	April.	
ummer.	.....	3	3	4	3	Autumn.	.....	
Winter.	January.	14	6	11	11	Spring.	March.	
Winter.	.....	3	0	1	0	Spring.	April.	
.....	.....	1	0	0	1	.....	.....	
Spring.	May.	0	1	0	1	.....	.....	
r. & Aut.	November.	2	5	1	5	Sum.&Win.	January.	
Spring.	March.	311	138	209	265	Spring.	February.	

Altitude 1,131 feet above the sea-level): January, 28.1°;

February, 29.3°; March, 37.8°; April, 51.5°; May, 58.1°; June, 67.8°; July, 72.9°; August, 69.8°; September, 61.5°; October, 48°; November, 35.6; December, 29°—thus giving a spring temperature of 49.1°; summer, 70.2°; autumn, 48.4°; winter, 28.8°; or a mean annual temperature of 49.1°.

At Cincinnati, the fall of rain and melted snow, at the different seasons, reads as follows: Spring, 12.14 inches; summer, 13.70; autumn, 9.90; winter, 11.15—thus giving a total mean annual fall of 46.89 English inches. Cincinnati is in the extreme southwestern corner of the state, while Hudson is in the far northeastern portion.

Epidemics of erysipelas and puerperal fever are mentioned by Drake (*loc. cit.*), Dawson (*loc. cit.*), and others. Dr. H. G. Cary, of Dayton, Ohio,\* says: "Erysipelas made its appearance in October, 1843, at Dayton, and continued in an epidemic form until the following May. The disease was confined mainly to adults—pregnant females being most obnoxious to its influence. Premature labor was often induced, followed by fatal peritonitis. Few parturients escaped." Again, in another part of his article, Carey says, speaking of the epidemic of erysipelas, as it prevailed in other parts of the country: "As, at Dayton, pregnant females advanced in gestation were exceedingly prone to premature labor, and the period of accouchement was looked to by the patient and physician with the deepest anxiety and solicitude. But one female within the range of my information escaped. She took the precaution to secure the services of a neighboring physician, without the infected district, and had a speedy 'getting up.' All, however, who were attended during labor by the practitioners under whose care most of the erysipelas came, died, in some instance, as early as twelve hours after delivery. Dr. Gish, of Salem, the point at which the disease prevailed in the northwest, thinks that puerperal peritonitis spread in a manner very like a contagious affection. Dr. Taylor, of Carrollton, resided six miles from the infected district and visited it daily, administering to the afflicted inhabitants. At the same time, he was engaged in a large obstetrical practice at home, yet not a single case of peritonitis occurred among his patients during the prevalence of the epidemic.

\* Hydrography, Topography, Geology, and Climate of Montgomery County. Epidemics from its Settlement up to 1854. Transactions of the American Medical Association, Vol. VII, 1854, p. 304.

One case, however, was developed and proved fatal in his neighborhood, and a mile farther removed from the infected region. The patient was attended by a midwife, upon whose wrist there was a small scratch, which subsequently became erysipelalous."

In 1844, there was an epidemic of erysipelas near Alexandersville, on the Miami river; in 1847, at Germantown. These epidemics are spoken of by Cary; and, in addition, another epidemic on the east side of the Miami river, in the northern part of the county, in the autumn of 1852. In Shelby county, erysipelas prevailed as an epidemic in May, 1851, and the winters of 1851 and 1852 (M. T. Carey, of Sidney, Ohio, quoted by H. G. Cary, of Dayton). In Highland county, Dr. Sams, of Hillsboro, states: "During the past winter (1852), erysipelas has prevailed to a considerable extent" (quoted by Carey). In Belmont county, Dr. West, of St. Clairsville, writes that, "During the years 1851 and 1852, this disease has occurred at various times as an epidemic" (quoted by Cary). A previous epidemic, in this same county, in 1833, is mentioned by Drake (*loc. cit.*)—also, epidemics of erysipelas occurring in Preble county, 1836; Meigs county, 1845-46; Brown county, 1848-49; Miami Valley, 1842-43. Others might be quoted; but let these suffice to show that these diseases are not uncommon in the State of Ohio.

*Study of the Table.*—Out of a total population of 2,665,260 souls (1870), 272 persons died from erysipelas. As regards sex, 140 of these were males and 132 females. Of these again, 245 were native born (242 whites, 3 colored), and 27 were foreigners. During the same time, 112 women died of puerperal fever. Of these, 91 were native born (90 whites and 1 colored), while 21 were foreign born. The foreign-born decedents from both diseases may be thus arranged:

NATIVITY.	ERYSIPELAS.	PUERPERAL FEVER.
Germany .....	11	17
Ireland.....	8	4
England and Wales.....	3	0
All others.....	5	0
Total.....	27	21

The season of greatest mortality from erysipelas was spring (88). The season of greatest mortality from puerperal fever was spring (40). The months of greatest mortality from erysipelas were March and April (*i. e.* 30 each). The month of greatest mortality from puerperal fever was March (20).

*Reflections.*—It will be noticed that both diseases were evidently most prevalent at the same season and the same month. Ohio has a foreign-born population of 372,493. The colored population, at the same period (1870), numbered 63,213; from whence it will be seen that many more deaths occurred among the whites, in proportion to population, than among the colored; also, that the native-born inhabitants suffered more from erysipelas than the foreign-born, while, at the same time, the foreign-born suffered more from puerperal fever, in proportion to population, than the native-born. This may seem to contradict a previous observation, made regarding the prevalence of erysipelas and puerperal fever among our foreign-born population—the German and English especially. This apparent discrepancy in statement will be satisfactorily explained ere the close of our article. It will be noticed that both diseases appear to be more prevalent in Ohio than in New England and the Middle States, in proportion to population; while in Ohio the relative mortality from erysipelas is much greater, in proportion to population, than it is in the Southern States, at the same time there seems to be a great deal less of a tendency toward puerperal fever—that is, if we are to judge from these mortality tables; and I think such tables most assuredly afford a fair criterion enough to go by in pursuing the investigation of all such subjects as we are discussing. It may be claimed that the mortality tables for one “census year” do not afford sufficient evidence. In answer to such an objection, we refer to the “census tables” of 1850 and 1860, as being approximately correspondent, judging, hastily of course, from their total footings, and allowing for the natural increase of population which has occurred in the interval of obtaining the statistics of each particular census; for, with this increase in population, a like increase in the number of decedents will naturally occur. If any great difference exists in the relative mortality lists of the two diseases under discussion, for a period dating back twenty years (1850 to 1870), such difference indicated no special epidemic tendency at the periods the different censuses were taken. To be sure, in 1850 the mortality from erysipelas was more than it was in 1860; while, on the contrary, in 1850, puerperal fever was more than one hundred per cent. less than in 1860. I think the influx of foreign immigration, which set in so strong between 1850 and 1860, increased the death-rate from puerperal fever.

The following statement shows on what grounds we base ourselves, when we assert that the tables correspond near enough for the different census years to enable one to make at least a rough calculation in regard to the subject under discussion :

YEAR.	TOTAL POPULATION.	ERYSIPELAS.	PUERPERAL FEVER.
1850	23,191,876	2,786	520
1860	31,443,321	2,746	1,202
1870	38,558,371	3,162	1,828

It is possible that the erysipelas epidemic of 1848-49 may have run up the death-rate from that disease in 1850, owing to the lingering tendency to the disease after the subsidence of its first violent outbreak.

We will not discuss this last point further, but will now turn to the study of the tables relative to Kentucky.

KENTUCKY.—Lying between latitude 36° 30' and 39° north, and extending from 82° to 89° longitude west of Greenwich, is the State of Kentucky. Looking over a hypsometric sketch of the state, we notice that the far western portion of it varies from 400 to 800 feet above the sea-level. At the north the land becomes higher, running from 800 feet up to 2,000 feet. In eastern and southeastern Kentucky the land becomes mountainous, near the Virginia and Tennessee state-lines.

At Louisville, in northern Kentucky (latitude 38°, longitude 85° 25', altitude 600 feet above the sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January, 35.8°; February, 36.7°; March, 45.3°; April, 57.4°; May, 63.6°; June, 71.5°; July, 74.6°; August, 73.3°; September, 67.4°; October, 52.5°; November, 44.1°; December, 36.4°—thus giving a temperature of 55.4° in spring; summer, 73.1°; autumn, 54.7°; winter, 36.3°; or a mean annual temperature of 54.9°.

At Springdale, near Louisville, the quarterly fall of rain and melted snow is as follows:

SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
12.10 inches.	14.80 inches.	9.00 inches.	12.20 inches.	48.10 inches.

Epidemic erysipelas has prevailed in Kentucky at various times without doubt. Drake speaks of it as having broken out in the Louisville Hospital in 1843-44.

*Study of the Table.\**—Out of a total population of 1,321,011 souls, the mortality from erysipelas, in the State of Kentucky (1870), was 93. As regards sex, 46 were males and 47 females. Of these, 90 were native born (88 whites and 2 colored), and 3 were foreign born (Germans). Of the decedents from puerperal fever (83 in number), 81 were native born (62 whites, 19 colored), and 2 were foreign born (one being a German and the other an Italian). The season of greatest mortality from erysipelas was spring (27). The season of greatest mortality from puerperal fever was spring (31). The month of greatest mortality from erysipelas was August (13). The month of greatest mortality from puerperal fever was April (13).

*Reflections.*—Kentucky has a colored population of 222,210 (108,304 males and 113,906 females), from whence it is seen that the colored population form about one-sixth the aggregate, and that, while erysipelas was very rare among the negro population, puerperal fever seemed to be more fatal than among the whites—that is, of course, in proportion to population. Ohio, with twice the population of Kentucky, had more deaths from erysipelas and less deaths from puerperal fever, in proportion, than did the latter-named state.

TENNESSEE.—Lying between the latitudes 35° and 36° 30' north, and extending from 82° to 90° longitude west of Greenwich, is the State of Tennessee. A hypsometric sketch of the state shows that the western half varies from 400 to 800 feet above the sea-level; while, in the eastern portion of the state, it gradually rises from 800 to 2,000 feet, and even more, in the mountainous portion of the state, near the North Carolina state-line.

According to Blodgett, the mean monthly temperature at Knoxville (latitude 35° 56', longitude 83° 58', altitude 960 feet above the sea-level), in far Eastern Tennessee, reads as follows: January, 30.5°; February, 42.8°; March, 52.4°; April, 50.4°; May, 64.7°; June, 68.5°; July, 74.1°; August, 69.9°; September, 66.5°; October, 59.6°; November, 44.1°; December, 44.5°. At Memphis, in the southwestern corner of the state (latitude 35° 08', longitude 88°, altitude 400 feet above the sea-level), as follows: January, 41.7°; February, 45.9°; March, 55.3°; April, 59°; May, 68.9°; June,

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\* One death from puerperal fever is marked "month unknown," in the census tables. This one death was credited to the month of April.

75.8°; July, 79.9°; August, 78.5°; September, 72.5°; October, 58.4°; November, 53.3°; December, 40.2°. A quarterly and annual statement would then read about as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Knoxville .....	55.8°	70.8°	56.7°	39.3°	55.7°
Memphis .....	61.1	78.1	61.4	42.6	60.8

The fall of rain and melted snow in Memphis, at the different seasons, is as follows: Spring, 11 inches; summer, 7.80; autumn, 7.90; winter, 15.00—giving a total average annual rain-fall of 41.80 English inches.

Epidemic erysipelas has visited the state. According to Drake, it prevailed in Memphis in 1843-44, and also in Columbia in the latter year. Dr. W. L. Sutton,\* writing in 1853, says that, "In the vicinity of Georgetown (Ky.), erysipelas has not been epidemic for at least twenty years." A Memphis health report for 1853, embodied in Dr. Sutton's paper, shows a few deaths in that city from erysipelas and puerperal fever, but no epidemics.

*Study of the Table.*—Out of a total population of 1,258,520 persons in Tennessee (1870), there were 85 deaths from erysipelas. As regards sex, 53 of the decedents were males and 32 were females. Of these, again, 83 were native born (77 whites and 6 colored), and 2 were foreign born (one being English and the other Irish). During the same period, 82 women died of puerperal fever. Of these, all were native born (65 whites and 17 colored). The season of greatest mortality from erysipelas was winter (24). The season of greatest mortality from puerperal fever was spring (31). The month of greatest mortality from erysipelas was August (10). The month of greatest mortality from puerperal fever was May (13).

*Reflections.*—Tennessee has a colored population of 322,331 (156,800 males and 165,531 females), which is about one-fourth the aggregate. From this, it will be seen that the whites suffered more from erysipelas than the blacks; and the mortality from puerperal fever was about the same among the whites as the colored, in proportion to population. It will be also noticed, that the diseases were not associated at any corresponding period; that

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\* Report on the Epidemics of Kentucky and Tennessee. Transactions of the American Medical Association, Vol. VII, 1854, p. 85 et seq.

is, judging from the periods of maximum mortality. The death-rate from erysipelas was about the same as in Kentucky; the death-rate from puerperal fever slightly more, in proportion to population.

We now turn to West Virginia.

WEST VIRGINIA.—Lying between  $37^{\circ}$  and  $40^{\circ}$  of north latitude, for the most part, and extending from  $78^{\circ}$  to about  $82^{\circ} 30'$  longitude west of Greenwich, is the State of West Virginia.\* A hypsometric sketch of the state shows that most of it has an elevation above the sea-level of from 800 to 2,000 feet. In the eastern portion of the state is the mountainous country. Says Dr. E. A. Hildreth,† West Virginia's most distinguished medical writer, in speaking of the Ohio Valley district of the state: "The natural features of this section are a system of billowy hills and winding valleys. There is a gradual diminution in the height of the hills, from the northern to the southern part, as also a like declension from east to west. The altitude of this section would fairly represent the *mean level of the state*, which would be between 900 and 1,000 feet above the level of the sea. The following measurements will exhibit the configuration of this district: The height above tide-water, at the Pennsylvania line, is 675 feet; at Wheeling, 640 feet; at Parkersburg, 625 feet; at Point Pleasant, 560; at mouth of Big Sandy (state line), 537 feet; at Charlestown (Kanawha), 600 feet; at Grafton (Tygart's Valley), 1,000 feet. Hence the average elevation of this district is very nearly 700 feet. Average difference between the Ohio Valley and the highest table-lands of the mountain district, 1,725 feet." In an abstract of the deaths of West Virginia, for 1868 and 1869, published with Dr. Hildreth's paper, we see that quite a number of deaths occurred during those years from erysipelas, from whence we deduce that the disease is not uncommon in that state.

At Wheeling (latitude  $40^{\circ} 07'$ , longitude  $80^{\circ} 42'$ , altitude 640 feet above the sea-level), the mean monthly temperature, according to

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\* It must be understood that the boundaries given are not exactly accurate regarding any of the states heretofore enumerated. The latitude and longitude which includes the bulk of territory is all that is necessary to roughly calculate the astronomical climate of each state.

† Second Report of the Climatology and Epidemic Diseases of West Virginia. By E. A. Hildreth, M. D., Wheeling, W. Va. Transactions of the American Medical Association, Vol. XXIII, 1872, p. 247.

Hildreth, reads as follows: January, 34.44°; February, 34.26°; March, 45.76°; April, 49.89°; May, 62.29°; June, 71.32°; July, 76.20°; August, 73.66°; September, 64.38°; October, 52.08°; November, 41.41°; December, 31.50°—giving a mean annual of 52.52°. The mean temperature of the different seasons of the year is about as follows: Spring, 51°; summer, 71.54°; autumn, 52.72°; winter, 32.07°. At Marietta, Ohio, the mean rain-fall, at the various seasons, according to the records of Dr. S. P. Hildreth and Dr. G. O. Hildreth, reads as follows: Spring, 10.10; summer, 13.22; autumn, 8.41; winter, 8.78—giving an annual mean of 40.52 inches. Marietta is on the western boundary-line of West Virginia.

*Study of the Table.*—Out of a total population of 442,014 persons, 37 died from erysipelas in West Virginia (1870). As regards sex, 18 were males and 19 females; 35 were native-born whites, and 2 were foreign born (one being a German, the other a native of Great Britain). The deaths from puerperal fever numbered 13. Of these, 12 were native born (11 whites and 1 colored), while 1 was a native of Ireland. The season of greatest mortality from erysipelas was summer (11). The season of greatest mortality from puerperal fever was winter (5). The month of greatest mortality from erysipelas was December (6). The month of greatest mortality from puerperal fever was February (4).

*Reflections.*—West Virginia has a colored population of 17,980 (8,972 males and 9,008 females). It will be noticed that no colored person died of erysipelas and only one from puerperal fever. It will be noticed, also, that both diseases prevailed to about the same degree at all the seasons of the year.

We now turn our faces to the far north.

**MICHIGAN.**—Of a most grotesque and irregular shape, this state extends from the neighborhood of 41° 40' to 47° north latitude, and is encompassed by the imaginary boundary-lines of 82° and 87° longitude west of Greenwich—the northwestern portion of the state, however, extends as far west as 90°. We shall include this portion of Michigan when we give the astronomical climatic boundaries of Wisconsin. Michigan separates three great interior fresh-water oceans of the continent—*i. e.* Lakes Huron, Michigan, and Superior; and the state, for this reason, has an immense coast-line. A hypsometric sketch of the state shows that the land rises from its coast-line on all sides, and the central portion of the state is the highest. This broad coast-belt has an elevation

of from 400 to 800 feet above the sea-level, in the southern part of the state. In central southern Michigan the altitude increases from 800 to 1,600 feet. In northwestern Michigan, in the iron and copper regions of Marquette and Ontonagon, the land is still higher.

At Detroit, one of the oldest towns in the New World (it having been settled in 1683, by the French), the mean monthly temperature, according to Blodgett, reads as follows (latitude 42° 20', longitude 82° 58', altitude 580 feet above tide-water): January, 27°; February, 26.6°; March, 35.4°; April, 46.3°; May, 56°; June, 65.6°; July, 69.7°; August, 67.5°; September, 60°; October, 47.7°; November, 38.2°; December, 26.9°. At Copper Harbor, in the extreme north (latitude 47° 30', longitude 88°, altitude 620 feet above the sea): January, 23.4°; February, 21.4°; March, 28.9°; April, 38.1°; May, 48.4°; June, 56.7°; July, 63.5°; August, 62.2°; September, 55.8°; October, 42.9°; November, 30.2°; December, 20.5°. The temperature, by seasons, is as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Detroit.....	45.9°	67.6°	48.7°	26.8°	47.2°
Copper Harbor...	38.5	60.8	43	21.8	41

The variation, at these points, is very apparent.

The fall of rain and melted snow in various seasons, at selected stations, is as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Detroit.....	8.51	9.29	7.41	4.86	30.07
Fort Mackinac.....	4.67	8.88	7.01	3.31	23.87

Drake speaks of an epidemic of erysipelas, which occurred in Livingston county, in 1847. From a "Schedule of Diseases prevalent in Detroit, from January, 1852, to December 31, 1853,"\* in speaking of the month of January, 1852, Dr. Pitcher remarks: "I saw no case of puerperal fever this month, in which there were not indications of its approach before, or at the time of, parturition. Careful observation, I feel confident, will establish the fact that the disease is an epidemic—sometimes the cause of premature labor, and at others, excited into action by the incidents of childbirth." Speak-

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\* Report on the Epidemics of Michigan. By Dr. Z. Pitcher. Transactions of the American Medical Association, Vol. VII, 1854, p. 390 et seq.

ing of the months of February and March—for it seems erysipelas and puerperal fever were prevalent in those months, as also in January and April—Dr. Pitcher says: “I have called a case an erysipelas or a laryngitis, when others might, and perhaps with more propriety, have called them both typhoid fever, of which the erysipelas and laryngitis were the local manifestations.” And afterward, speaking of April: “Toward the close of this month there were a few hot days, which changed the local affections, but not the general character of disease. The cases of puerperal fever seen this month were all preceded by a chill at the commencement of labor, and attended by after-pains of uncommon severity.” Judging from these remarks, we are led to infer that erysipelas and puerperal fever have prevailed together as epidemics in Michigan. Also, in a report made by Dr. S. D. Richardson, of Centerville, Southern Michigan, we learn that, “Erysipelas has prevailed as an epidemic for the last two years (1851 and 1852); usually affecting the head and face. No fatal cases occurred.” And, “*Puerperal peritonitis* prevailed contemporaneously with erysipelas in this region. In some cases the erysipelas attacked the labia and vagina, and was soon followed by puerperal peritonitis. It was undoubtedly transmitted by the physician in some instances. The disease was of the adynamic form, and it was generally fatal, not more than one in four recovering,” etc., etc.

*Study of the Table.*—Out of a total population of 1,184,059 persons in Michigan (1870), the decedents from erysipelas numbered 106. As regards sex, 58 were males and 48 females. Of these, 88 were native born (87 whites and 1 *Indian*), and 18 were foreign born. During the same time, 36 women died from puerperal fever. Of these, 30 were native born (29 whites and 1 colored), and 6 were foreign born. The season of greatest mortality from erysipelas was spring (33). The seasons of greatest mortality from puerperal fever were spring and winter (10 each). The month of greatest mortality from erysipelas was December (18). The month of greatest mortality from puerperal fever was January (5).

*Reflections.*—Michigan has a foreign-born population of 268,010; or, roughly calculating, about one-fifth the total population, from whence it will be seen that the native and foreign-born suffered about equally from both diseases. It will be noticed that the diseases appear to be most prevalent at the same seasons. The in-

crease of erysipelas and the decrease in puerperal fever, as compared with states of about the same population farther south, Kentucky for instance, will be noticed.

Next in order will be the State of Wisconsin.

WISCONSIN.—Lying between 42° 30' and 47° north latitude, and extending from 87° to about 92° longitude west of Greenwich, is the State of Wisconsin. A hypsometric sketch of the state shows most of it to have an elevation above the sea-level, varying from 600 to 2,000 feet.

At Green Bay (latitude 44° 30', longitude 88° 05', altitude 620 feet above tide-water), according to Blodgett, the mean monthly temperature reads as follows: January, 18.9°; February, 20°; March, 31.3°; April, 43.4°; May, 55.8°; June, 66.2°; July, 71.5°; August, 67.9°; September, 57.2°; October, 46.5°; November, 34.3°; December, 20.8°. At Milwaukee (latitude 43° 04', longitude 87° 57', altitude 600 feet above the sea-level): January, 25.2°; February, 29.4°; March, 34.8°; April, 40.7°; May, 51.3°; June, 64.8°; July, 69.8°; August, 67.5°; September, 61.2°; October, 50.7°; November, 38.5°; December, 23.5°—thus giving a mean quarterly and annual temperature as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Green Bay.....	43.5°	68.5°	46°	19.9°	44.5°
Milwaukee.....	42.3	67.3	50.1	26	46.4

The fall of rain and melted snow, at the different seasons, in Milwaukee, is as follows: Spring, 6.60 inches; summer, 9.70; autumn, 6.80; winter, 4.20—giving a mean annual of 27.20 inches.

Drake mentions an epidemic of erysipelas occurring at Milwaukee in 1843-44.

*Study of the Table.*—Out of a total population of 1,054,670 persons in the State of Wisconsin (1870), the decedents from erysipelas numbered 47. As regards sex, 20 were males and 47 females. Of these, 35 were native-born whites and 12 were foreigners. During the same period, 31 women died from puerperal fever. Of these, 5 were native born and 26 were foreign born. The foreign-born decedents were mostly Germans or Norwegians; 24 out of the 26 came from the northern part of Europe. The season of greatest mortality from erysipelas was winter (16). The season of greatest mortality from puerperal fever was winter (10). The month of greatest mortality from erysipelas was February (10).

The months of greatest mortality from puerperal fever was December and July (*i. e.* 5 each).

*Reflections.*—It will be noticed that there is much less erysipelas in Wisconsin, in proportion to population, than there is in Michigan. Wisconsin has a foreign-born population of 364,499 persons.

From this statement it will be seen that at least one-third of the population is foreign born, and therefore more deaths, in proportion to population, from erysipelas occurred among the native than the foreign born; while, on the contrary, more foreign-born women died from puerperal fever than did those who were native born. No epidemic of either disease appears to have prevailed.

INDIANA.—Lying, for the most part, between 38° and 42° north latitude, and extending from about 84° 45' to 87° 30', longitude west from Greenwich, is the State of Indiana. A hypsometric sketch of the state shows it to have an elevation, for the most part, of from 400 to 800 feet above the sea-level. In the eastern portion of the state, near the Ohio state line, the land is still higher at points.

At New Harmony, according to Blodgett (latitude 38° 11', longitude 86° 50', altitude 400 feet above tide-water), the mean monthly temperature reads as follows: January, 34.1°; February, 41.5°; March, 52.5°; April, 56°; May, 67.6°; June, 76.4°; July, 78.8°; August, 75.5°; September, 65.6°; October, 55.7°; November, 43.3°; December, 37.3°. At Milton (latitude 39° 47', longitude 85° 02', altitude 800 feet above the level of the sea): January, 29.5°; February, 28.8°; March, 38.2°; April, 52.8°; May, 62.7°; June, 69.2°; July, 77.5°; August, 73.6°; September, 69.5°; October, 53.6°; November, 41°; December, 30.8°. The mean temperature at the quarters and annually would read as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
New Harmony.....	58.7°	76.9°	54.9°	37.6°	56.9°
Milton .....	51.2	78.4	54.7	29.7	52.2

The fall of rain and melted snow, at the various seasons, at New Harmony, is as follows: Spring, 10.51 inches; summer, 12.79; autumn, 7.26; winter, 12.29—giving a mean annual of 42.85 English inches. Drake mentions an epidemic of erysipelas occurring in Michigan City, Indiana, in 1843-44.

*Study of the Table.*—Out of a total population of 1,680,637 persons, the mortality from the single cause of erysipelas, in the

State of Indiana (1870), was 183. As regards sex, 88 were males and 95 females. Of these, 173 were native born (172 whites and 1 colored), and 10 were foreign born, 8 of whom were Germans. During the same time 87 women died of puerperal fever, 81 of whom were native-born whites, and the other 6 were foreigners. The season of greatest mortality from erysipelas was winter (54). The season of greatest mortality from puerperal fever was spring (33). The month of greatest mortality from erysipelas was February (24). The month of greatest mortality from puerperal fever was March (16).

*Reflections.*—Indiana has a foreign-born population of 141,427 persons; from thence it is seen that the foreign born suffered less from both diseases, in proportion to population, than the native born. It will be noticed that the season and month of the greatest mortality from erysipelas preceded the season and month of greatest mortality from puerperal fever. It will be noticed that the mortality, from both diseases in this state, is quite large.

We now turn to the great State of Illinois.

ILLINOIS.—Lying between 37° and 42° 30' north latitude, and extending from about 87° 30' to about 91° 30' longitude west of Greenwich, is the State of Illinois. A hypsometric sketch of the state shows it to have an elevation varying from 400 to 890 feet above the level of the sea.

At Athens (latitude 39° 52', longitude 89° 56', altitude 650 feet above tide-water), the mean monthly temperature, according to Blodgett, reads as follows: January, 25.7°; February, 28.5°; March, 39.6°; April, 57.9°; May, 65.6°; June, 71.8°; July, 79.4°; August, 77.4°; September, 73°; October, 56°; November, 42.5°; December, 29.8°. At Chicago (latitude 41° 52', longitude 87° 35', altitude 591 feet above the sea-level): January, 23.6°; February, 24.7°; March, 32.3°; April, 46.1°; May, 56.3°; June, 62.7°; July, 70.8°; August, 68.5°; September, 60.1°; October, 48.5°; November, 37.9°; December, 29.3°. Arranged by seasons and annually, they read as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Chicago.....	44.9°	67.3°	48.8°	25.9°	46.7°
Athens.....	54.4	76.2	57.2	28	53.9

The mean fall of rain and melted snow, at Athens, reads as follows: Spring, 12.20 inches; summer, 13.30; autumn, 9.20; winter, 7.10—giving a mean annual of 41.80 inches. Dr. Drake men-

tions an epidemic of erysipelas which occurred at Bloomington, Illinois, in the years 1843-44.

*Study of the Table.*—Out of a total population of 2,539,891 persons in Illinois (1870), the number of decedents from erysipelas was 264. As regards sex, 139 were males and 125 females. Of these, the nativity of 1 was unknown, 235 were native-born whites, and 28 were foreigners. During the same period, 149 women died from puerperal fever. Of these, 86 were native born (83 whites and 3 colored), while 63 were foreign born. The foreign born, from both diseases, might be tabulated thus :

NATIVITY.	ERYSIPELAS.	PUERPERAL FEVER.
Germany .....	11	29
Sweden and Norway .....	1	7
Ireland.....	7	17
England and Wales.....	5	3
All others.....	4	7
Total.....	28	63

The season of greatest mortality from erysipelas was spring (84). The season of greatest mortality from puerperal fever was spring (57). The months of greatest mortality from erysipelas were March and April (31 each). The month\* of greatest mortality from puerperal fever was March (25).

*Reflections.*—Both diseases seem to have been most prevalent at about the same period. Illinois had a foreign-born population of 515,198 persons in 1870; also a colored population of 28,762. It will be noticed, that about one-fifth of the population was foreign born; and, from thence, we see that the foreign-born population suffered much less from erysipelas than the native-born, while, on the contrary, the mortality from puerperal fever among the foreign-born was greater, in proportion to population, than among the native-born.

We have before seen this state of affairs existing, when we were investigating the Middle and New England States. As compared with Ohio, there seems to be about the same amount of erysipelas in Illinois; while, at the same time, there appears to be more puerperal fever, in proportion to population, in the latter-named state.

We shall now turn to the consideration of Missouri.

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\* In Illinois, one death occurred from puerperal fever in a month unknown. This, in order to balance the table with the figures in the census, was credited to the month of March. (25+1=26).

MISSOURI.—Lying, for the most part, between 36° 30' and 40° 30' north latitude, and extending from about 90° to 95° longitude west of Greenwich, is the State of Missouri. A hypsometric sketch of the state shows that the land rises from the eastern and western borders, where it varies from 400 to 800 feet above the sea-level. In the central portion of the state the land is still higher, running from 800 to 2,000 feet above tide-water.

At St. Louis (latitude 38° 37', longitude 90° 15', altitude 462 feet above the level of the sea), the mean monthly temperature, according to Engleman,\* reads: January, 36.2°; February, 38.8°; March, 48.3°; April, 52.8°; May, 69°; June, 72.9°; July, 78°; August, 75.6°; September, 72.5°; October, 56.1°; November, 41.1°; December, 30.5°—giving a mean spring temperature of 56.7°; summer, 75.5°; autumn, 56.6°; winter, 35.1°; and a mean annual temperature of 55.9°. The fall of rain and melted snow, at St. Louis, at different seasons, reads as follows: Spring, 12.30 inches; summer, 14.14; autumn, 8.94; winter, 6.94—giving an annual mean of 42.32 inches.

From a report presented to the American Medical Association, in 1855, † we glean the following information regarding erysipelas and puerperal fever, as they prevail in Missouri. Dr. Wilcox, of Boone county, writing in 1852, says, in speaking of the diseases of that county: "Erysipelas has also prevailed, both as an endemic and an epidemic. In its endemic form, the symptoms were mild, but well marked. As an epidemic, it prevailed here, in the year 1847, in its most malignant form. . . . It made its appearance again in 1851. . . . Then, again, it made its appearance in 1852." Dr. Wilcox also refers to an epidemic of erysipelas occurring in Howard county in 1852. Dr. H. Ready, of Westport, Jackson county, speaks thus of the epidemic which occurred in his neighborhood in the winter of 1851-52: "This disease, under consideration, is known as epidemic erysipelatous fever, or by common title, black tongue." Dr. Mangles, of Fayette, speaks of erysipelas in Howard county, thus: "Epidemic erysipelas made its appearance in Howard county, in January of this year (1852), prevailing chiefly in a district of about ten miles in width, by

\* Transactions of the American Medical Association, Vol. VIII, 1855, p. 294.

† Report on the Diseases of Missouri and Iowa. By Thomas Reytburn, M. D., St. Louis.

eighteen or twenty in length, with scattered cases in other sections of the country." Dr. R. T. P. Ridley, of Platte county (Weston), speaks of the epidemic occurring there in January and February, 1852: "Cases of erysipelas occurred in Platte county, Missouri, in which there was marked evidence of the propagation of the disease by contagion." Dr. Ridley remarked "the connection of puerperal peritonitis with erysipelas." Dr. C. Q. Chandler, of Cooper county, says: "Erysipelas prevailed in the southwest section of this county, and in the adjoining county of Moniteau, during the winter of 1851-2. This disease, together with puerperal fever, raged in a most malignant and fatal form." Other authorities might be quoted, regarding the prevalence of the two diseases in Missouri.

*Study of the Table.*—Out of a total population of 1,721,295 persons in Missouri (1870), the mortality from the single cause of erysipelas was 188. As regards sex, 99 were males and 89 were females. Of these, the nativity of 2 was unknown; 163 were native born (161 whites and 2 colored), while 23 were foreign born (11 Germany, 9 Ireland, and 3 Great Britain). During the same period, 161 women died of puerperal fever. Of these, 129 were native born (119 whites and 10 colored), while 32 were foreign born (18 Germany, 7 Ireland, 1 England, 2 France, all other countries 4). The season of greatest mortality from erysipelas was spring (65). The season of greatest mortality from puerperal fever was spring (44). The months of greatest mortality from erysipelas were March and September (23 each). The months of greatest mortality from puerperal fever were August and February (19 each).

*Reflections.*—Missouri has a foreign-born population of 222,174, and a colored population of 118,071. On a rough calculation, then, about one-eighth of the population is foreign born, and about one-fifteenth is colored; from whence we see that, in proportion to population, the foreign-born suffered to about the same degree, from erysipelas, as the native-born, while, at the same time, they suffered much more from puerperal fever than the latter. The blacks suffered but slightly from erysipelas as compared with the whites, but suffered from puerperal fever to about the same degree as the latter. The mortality from erysipelas, in Missouri, is about the same as in Indiana, while the mortality from puerperal fever is much larger in the former State.

We now turn to Arkansas.

ARKANSAS.—Extending from 33° to about 36° 30' north latitude, and stretching from 90° to 94° 30' longitude west of Greenwich, is the State of Arkansas. According to Dr. George W. Lawrence:\* “The elevated parts of the state commence at the undulations of the surface in the southwestern part, soon developing into foothills and mountains of the ‘Marserne range,’ and expanding into broad mountain tracts, as we course toward the north and east, until we meet the Ozark Mountains, which, commencing near Little Rock, extend north and westerly, beyond the limits of the state. They obtain an elevation of from 1,500 to 2,000 feet.”

At Fort Smith (latitude 35° 23', longitude 94° 29', altitude 460 feet above tide-water), the mean monthly temperature reads as follows: January, 40.2°; February, 43.9°; March, 51.6°; April, 62.4°; May, 69.9°; June, 75.5°; July, 79.2°; August, 78.1°; September, 72.2°; October, 59.6°; November, 48.3°; December, 39.3°. (Blodgett, quoted by Lawrence.) At Little Rock, the mean monthly temperature reads as follows: January, 43.06°; February, 50.72°; March, 56.88°; April, 64.65°; May, 71.04°; June, 81.26°; July, 82.14°; August, 85.89°; September, 72.86°; October, 63.10°; November, 47.01°; December, 41.31°. (Lawrence.) This would give a mean quarterly temperature, at these two stations, as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Smith.....	61.3°	77.6°	60.1°	41.1°	60°
Little Rock.....	72	80	50	50	63

The fall of rain in Little Rock, in 1871, was 43.80 inches (Lawrence). At Fort Smith the rain-fall, at the different seasons and annually, reads, according to Blodgett, as follows:

SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
12.48 inches.	13.03 inches.	9.93 inches.	6.66 inches.	42.10 inches.

Lawrence, speaking of the zymotic diseases in the State of Arkansas, says: “Erysipelas of idiopathic type is unknown;” and also, that, “Uterine diseases and puerperal complications are very rare.”

*Study of the Table.*—Notwithstanding Lawrence’s assertion re-

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\* Report of the Committee on Climatology, etc., of Arkansas. By George W. Lawrence, M. D., Hot Springs. Transactions of the American Medical Association, Vol. XXIII, 1872, p. 400.

garding erysipelas and puerperal complications, we see that out of a total population of 484,471 persons residing in the State of Arkansas, in the year 1870, that 51 died of erysipelas. As regards sex, 26 were males and 25 were females. Of these, 50 were native born (44 whites and 6 colored), while 1 was a foreigner (German). During the same period, 56 women died from puerperal fever, all of the decedents being native born (52 whites and 4 colored). The season of greatest mortality from erysipelas was autumn (17). The season of greatest mortality from puerperal fever was winter (19). The month of greatest mortality from erysipelas was September (7). The months of greatest mortality from puerperal fever were September and February (7 each).

*Reflections.*—Arkansas has a colored population of 122,169 (61,680 males and 60,489 females). This would be about one-fourth the total population; hence it will be noticed that the whites suffered much more from both diseases, in proportion to population, than did the blacks. Arkansas seems to suffer as much from erysipelas and puerperal fever as any other Western state.

We now turn to Kansas.

KANSAS.—Lying between 37° and 40° north latitude, and extending from about 94° 30' to 102° longitude west of Greenwich, is the State of Kansas. A hypsometric sketch of the state shows the eastern and central portions to have an elevation varying from 800 to 2,000 feet, while the western portion has an altitude of between 3,000 and 4,000 feet above the sea-level at some points.

At Fort Leavenworth (latitude 39° 21', longitude 94° 44', altitude 896 feet above the sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January, 28°; February, 31.1°; March, 42.2°; April, 55.5°; May, 63.6°; June, 71.3°; July, 76.7°; August, 74.2°; September, 66.2°; October, 54.4°; November, 40.4°; December, 29.8°. At Fort Riley (latitude 39° 03', longitude 96° 25', altitude 1,300 feet above the sea-level): January, 27.1°; February, 33.7°; March, 42.7°; April, 60.2°; May, 66.5°; June, 73.2°; July, 83.7°; August, 84.7°; September, 72.3°; October, 64.6°; November, 43.6°; December, 36.4°. The mean quarterly then reads as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Leavenworth.	53.8°	74.1°	53.7°	29.6°	52.8°
Fort Riley.....	56.5	77.2	60.2	32.4	56.6

At Fort Atkinson (latitude  $37^{\circ} 47'$ , and at an altitude of 2,330 feet above the level of the sea, the fall of rain and melted snow, at different seasons, is as follows: Spring, 13.68; summer, 7.15; autumn, 12.05; winter, 2.13—giving an annual fall of 35.01 inches.

I have no information relative to the former epidemics of Kansas.

*Study of the Table.*—Out of a total population of 364,399 persons, residing in Kansas in 1870, there were 46 died of erysipelas. As regards sex, the decedents were evenly divided, *i. e.* 23 males and 23 females. Of these, 40 were native-born whites and 6 were foreigners. During the same year, 37 women died of puerperal fever. Of these, 35 were native born (33 white, 1 colored, and 1 *Indian woman*), and 2 were foreign born. The season of greatest mortality from erysipelas was spring (15). The season of greatest mortality from puerperal fever was spring (15). The month of greatest mortality from erysipelas was October (9). The month of greatest mortality from puerperal fever was April (6).

*Reflections.*—No special connection seems to have existed between the two diseases. The mortality from both diseases seems to be about the same in Kansas, in proportion to population, as in other Western states. Kansas has a foreign-born population of 48,392 persons; from whence it will be seen that, in proportion to population, fewer foreign-born than native-born women died of puerperal fever. It is also noticeable, as a matter of momentary interest, that one *Indian squaw* died of puerperal fever.

We now turn our attention to Minnesota.

MINNESOTA.—Extending from  $44^{\circ} 30'$  to  $49^{\circ}$  north latitude, and from  $91^{\circ}$  to  $97^{\circ}$  longitude west from Greenwich, is the State of Minnesota. A hypsometric sketch of the state shows it to have an elevation ranging from 800 to 2,000 feet above tide-water.

At Fort Snelling (latitude  $44^{\circ} 53'$ , longitude  $93^{\circ} 10'$ , altitude 820 feet above the sea-level), the mean monthly temperature, according to Blodgett, reads as follows: January,  $13.7^{\circ}$ ; February,  $17.6^{\circ}$ ; March,  $31.4^{\circ}$ ; April,  $46.3^{\circ}$ ; May,  $59^{\circ}$ ; June,  $68.4^{\circ}$ ; July,  $73.4^{\circ}$ ; August,  $70.1^{\circ}$ ; September,  $58.9^{\circ}$ ; October,  $47.1^{\circ}$ ; November,  $31.7^{\circ}$ ; December,  $16.9^{\circ}$ . At Fort Ripley (latitude  $46^{\circ} 19'$ , longitude  $94^{\circ} 19'$ , altitude 1,130 feet above the sea-level), January,  $7.9^{\circ}$ ; February,  $11.9^{\circ}$ ; March,  $24.4^{\circ}$ ; April,  $40.7^{\circ}$ ; May,  $52.9^{\circ}$ ; June,  $62.8^{\circ}$ ; July,  $67.3^{\circ}$ ; August,  $64.7^{\circ}$ ; September,  $56.7^{\circ}$ ; October,  $44^{\circ}$ ; November,  $28.1^{\circ}$ ; December,  $10.3^{\circ}$ —giving a mean quarterly and annual temperature as follows:

## ERYSIPELAS, ETC., IN THE STATES.

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Snelling.....	45.6°	70.6°	45.9°	16.1°	44.6°
Fort Ripley.....	39.3	64.9	42.9	10	39.3

The quarterly fall of rain and melted snow, at the two same military posts, reads as follows :

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Snelling.....	6.61	10.92	5.98	1.92	25.43
Fort Ripley.....	6.31	12.64	8.19	2.02	29.16

I have no information relative to the epidemics of Minnesota.

*Study of the Table.*—Out of a total population of 439,706 persons residing in Minnesota, in the census year 1870, 14 died of erysipelas. As regards sex, 9 of these decedents were males and 5 were females. Of these, again, 13 were native-born whites, and 1 was a Swede. During the same period, 13 women died of puerperal fever. Of these, 5 were native born (4 whites and 1 Indian), while 8 were foreign born. The season of greatest mortality from erysipelas was summer (5). The season of greatest mortality from puerperal fever was autumn (4). There seems to have been no particular month of greatest mortality from either disease.

*Reflections.*—Comparing Minnesota with Maine, New Hampshire, and other New England states, lying in about the same latitude, we notice that, in proportion to population, Minnesota suffers less from erysipelas and more from puerperal fever. We also see that another Indian woman died of puerperal fever. Minnesota has a foreign-born population of 160,697 persons; from whence it will be seen that, in proportion to population, fewer foreign-born than native-born died of erysipelas, while the reverse was the case regarding puerperal fever. No epidemic of either disease seems to have prevailed; and, at any rate, it is evident that no connection exists between the cases of erysipelas and those of puerperal fever. It will be observed that a low mean annual temperature is the rule in Minnesota. The temperature, at the period of the greatest mortality from erysipelas, was from 70° to 65° F.; at the period of greatest mortality from puerperal fever, it ranged from 40° to 45° F.

IOWA.—Lying between 40° 30' and 43° 30', north latitude, and extending from 91° to 96° of longitude west of Greenwich, is the State of Iowa. A hypsometric sketch of the state shows that most of it has an elevation of from 800 to 2,000 feet above the sea-level. In the extreme eastern portion of the state, along the borders of the upper Mississippi, however, the altitude is less than 800 feet.

At Muscatine (latitude 41° 25', longitude 91°, altitude 586 feet above tide-water), the mean monthly temperature reads as follows: January, 20.2°; February, 25.5°; March, 34.8°; April, 46.4°; May, 57.9°; June, 66.4°; July, 70.5°; August, 68.9°; September, 62.5°; October, 48.8°; November, 35.4°; December, 22.6°. At Dubuque (latitude 42° 29', longitude 90° 50', altitude 680 feet above the sea-level): January, 19.8°; February, 23.3°; March, 35.1°; April, 53.8°; May, 62.3°; June, 69.1°; July, 75.2°; August, 72°; September, 66.3°; October, 52.5°; November, 38.7°; December, 24.5°. The mean quarterly and annual statement reads as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR
Muscatine.....	46.4°	68.6°	48.9°	22.8°	46.7°
Dubuque.....	50.4	72.1	52.5	22.5	49.4

The quarterly fall of rain and melted snow at Muscatine is as follows: Spring, 11.19; summer, 15.08; autumn, 10.34; winter, 6.72—year, 44.33 inches.

I have no record of the epidemics of the state.

*Study of the Table.*—Out of a total population of 1,194,020 persons residing in Iowa in the census year of 1870, 85 died from erysipelas. As regards sex, 43 of the decedents were males and 42 females. Of these, again, 74 were native born (73 whites and 1 colored), while 11 were foreign born. During the same period 42 women died of puerperal fever. Of these, 32 were native-born whites, while 10 were foreign-born. The season of greatest mortality from erysipelas was winter (28). The season of greatest mortality from puerperal fever was spring (14). The month of greatest mortality from erysipelas was January (12). The month of greatest mortality from puerperal fever was March (7).

*Reflections.*—Iowa has a foreign-born population of 204,692. Roughly calculating the foreign-born population as being one-sixth the total population of the state, we see that less deaths from erysipelas occurred among the foreign-born, in proportion to popula-

tion, than among the native-born; while, on the contrary, more foreign-born women died from puerperal fever, in proportion to population, than did native-born. Iowa has about the same mortality rate from erysipelas as have the States of Kentucky and Tennessee; while, on the contrary, the puerperal fever deaths in Iowa are at least 100 per cent. less. Compared with some of the Western States having about the same population, it is noticeable that Iowa is not such a sufferer from either disease.

We now turn to Nebraska.

NEBRASKA.—Lying between  $40^{\circ}$  and  $43^{\circ}$  north latitude, and extending from  $96^{\circ}$  to  $104^{\circ}$  longitude west from Greenwich, is the State of Nebraska. A hypsometric sketch of the state shows that the eastern half of it has an elevation varying from 800 to 2,000 feet above the sea-level, while the western half is still higher, ranging from 2,000 to 4,000 feet. The meteorological observations in Nebraska extend over so short a period, and seem to be so incomplete, that I shall omit them.

I have no record of the epidemiology of the state.

*Study of the Table.*—Out of a total population of 122,993 persons residing in Nebraska in 1870, 5 died from erysipelas. As regards sex, 2 of the decedents were males and 3 females. All were whites (4 being native born and 1 foreigner—Irish). During the same period, 4 women died of puerperal fever. They were all white and native born. The season of greatest mortality from erysipelas was winter (2). The season of greatest mortality from puerperal fever was spring (3). The mortality from erysipelas did not exceed one at any month. The mortality from puerperal fever was greatest in the month of April (2).

*Reflections.*—No connection seems to have existed between the two diseases. In proportion to population, the mortality rate from erysipelas is less than in the District of Columbia, while the puerperal-fever rate is about the same.

NEVADA.—Lying between  $36^{\circ}$  and  $42^{\circ}$  north latitude, and extending from about  $114^{\circ}$  to  $120^{\circ}$  longitude west of Greenwich, is the State of Nevada. A hypsometric sketch of the state shows it to be elevated from 4,000 to 8,000 feet above the level of the sea. Regarding the meteorology and epidemiology of the state, the same remarks applied in the case of Nebraska, apply here also.

*Study of the Table.*—Out of a total population of 42,491 persons (32,379 males and 10,112 females), residing in Nevada in the cen-

sus year of 1870, 2 died of erysipelas. As regards sex, one was a male, the other a female. Both decedents were native-born whites. During the same period, 2 women died of puerperal fever. As regards nativity, one was a German, the other a Scotchwoman. One man died of erysipelas in July; the woman died from erysipelas in February. One of the decedents from puerperal fever died in the month of January; the other died in the month of March.

*Reflections.*—The statistics of Nevada are only of so much value as regards the altitude at which both erysipelas and puerperal fever prevail. We see that deaths occur from both diseases at elevations varying from 4,000 to 8,000 feet above tide-water.

OREGON.—Lying between 42° and 46° north latitude, and extending from 117° longitude west of Greenwich to the Pacific ocean, is the State of Oregon. A hypsometric sketch of the state shows the eastern and southeastern half of it to be mountainous, having an elevation of from 4,000 to 8,000 feet. The western and northwestern portions of the state are lower, varying, at points, from 800 to 2,000 feet. Along the Columbia river the land, in places, is not elevated more than 400 feet above the sea-level.

At Lapwai (Koskooskia), in latitude 46° 27', longitude 117°, altitude 1,000 feet above tide-water, the mean monthly temperature, according to Blodgett, reads as follows: January, 31.8°; February, 38.8°; March, 42.7°; April, 52.8°; May, 57.5°; June, 68.9°; July, 70.1°; August, 72°; September, 64°; October, 48.1°; November, 41.5°; December, 40.4°. At Oregon City (latitude 45° 20', longitude 122° 30', altitude 200 feet), as follows: January, 39.6°; February, 42°; March, 45.1°; April, 55.9°; May, 60.9°; June, 66.3°; July, 72.3°; August, 71.9°; September, 61.2°; October, 55.8°; November, 47.2°; December, 39.1°. The temperature, by seasons and annually, would read, at these stations, as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Lapwai.....	51°	70.3°	51.2°	36.9°	52.4°
Oregon City.....	54	70.2	54.7	40.2	54.8

At Astoria, the mean fall of rain and melted snow is as follows: Spring, 16.43; summer, 4.00; autumn, 21.77; winter, 44.15—giving a mean annual of 86.35 inches.

Assistant Surgeon Israel Moses,\* speaking of the diseases of Astoria (1852), says: "Five cases of erysipelas occurred, one in October

\* Government Reports.

two in November, and two in December," etc. From this it will be seen that the disease is not unfrequent in Oregon.

I have no record of the epidemiology of the state.

*Study of the Table.*—Out of a total population of 90,923 persons residing in Oregon, in the census year 1870, 5 died from erysipelas. As regards sex, one of the decedents was a male, the four others females. They were all native-born whites. During the same period, 2 women died of puerperal fever. These likewise were native-born whites. The season of greatest mortality from erysipelas was spring (3). The seasons of greatest mortality from puerperal fever were summer and winter (1 each). The month of greatest mortality from erysipelas was May (3). One death from puerperal fever occurred in June, the other in January.

*Reflections.*—It is barely possible that a slight epidemic of erysipelas may have prevailed in May. If there was, however, no connection existed between the cases of erysipelas and those of puerperal fever.

We now turn to California.

CALIFORNIA.—Extending along the Pacific, with a coast-line about 750 miles in length, and having an average width of 200 miles, from about 32° 15' to 42° north latitude, and from 114° to 124°, at points, longitude west of Greenwich, is the great State of California. The western border of the state, adjoining the Nevada and Oregon lines, is of course mountainous, and altitudes of 8,000 feet and more above tide-water are not uncommon. In the middle portion of the state the ground becomes lower, and the central towns of Marysville, Folsom, Lincoln, Sacramento, and Stockton lie, spread out in this lower valley, as it were. West of this, again, is more mountainous country, and then the low, narrow coast-line. At some of these interior points, along the Sacramento river, for instance, the country has no higher altitudes than 400 to 800 feet. In the southeastern portion of the state the altitude will average from 4,000 to 8,000 feet. So much for a rough hypsometric sketch.

According to Blodgett, the mean monthly temperature at Fort Jones (latitude 41° 36', longitude 122° 52', altitude 2,570 feet above the sea-level) reads as follows: January, 31.4°; February, 37.4°; March, 43.1°; April, 49.3°; May, 54.7°; June, 61.5°; July, 71.5°; August, 68.7°; September, 62.7°; October, 51.8°; November, 41.8°; December, 32.5°. At Sacramento (latitude 38° 34', longitude 121° 40', altitude 39 feet above tide-water): January, 44.9°; Feb-

ruary, 52.1°; March, 55°; April, 59.7°; May, 63.4°; June, 71.7°; July, 76.1°; August, 71.2°; September, 69.7°; October, 65.3°; November, 52.9°; December, 47.3°. At San Francisco (latitude 37° 48', longitude 122° 20', altitude 50 feet above the sea): January, 50.1°; February, 52.9°; March, 54.5°; April, 58.6°; May, 57.8°; June, 58.6°; July, 59.8°; August, 60.9°; September, 61.5°; October, 61.7°; November, 57°; December, 51.5°. At Fort Yuma (latitude 32° 43', longitude 114° 36', altitude 120 feet above tide-water): January, 56.4°; February, 58°; March, 66.1°; April, 73.5°; May, 76.7°; June, 87.3°; July, 92.3°; August, 90.3°; September, 86.1°; October, 76.5°; November, 64.4°; December, 55.9°.

The mean quarterly and annual temperature, at the points before named, is as follows:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
Fort Jones.....	49°	67.3°	52.1°	33.8°	51.4°
Sacramento.....	59.4	73	62.6	48	60.7
San Francisco.....	57	60.1	60.1	51.5	57.2
Fort Yuma.....	72.1	90	75.7	56.8	73.6

The mean quarterly and annual fall of rain and melted snow at various points:

STATION.	SPRING.	SUMMER.	AUTUMN.	WINTER.	YEAR.
San Francisco.....	7.56	0.09	2.96	11.34	21.95
Sacramento.....	5.91	0.32	1.66	8.28	16.17

In a most able report,\* written by Dr. Hatch, of Sacramento (p. 349), this gentleman says of erysipelas: "As an epidemic, this disease has not often presented itself in our valley-sections of the state, though cases have frequently occurred sporadically. There have been only two exceptions within our knowledge. First, in 1862, soon after the great flood, when the condition of the atmosphere seemed to be peculiarly favorable to its development, particularly in its traumatic form, cases occurring after the most trivial wounds, and even as a result of vaccination. Variola was epidemic at the same time. Again, during the past year, a large number of cases presented themselves, the disease assuming for a time the proportions of an epidemic," etc. No mention is made of puerperal fever epidemics.

*Study of the Table.*—Out of a total population of 560,247 per-

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\* Report on Climatology and Diseases of California. By F. W. Hatch, A. M., M. D., Sacramento, Cal. Transactions American Medical Association, Vol. XXXIII, 1872.

sons residing in the State of California (census year 1870), 37 died of erysipelas. As regards sex, 24 were males and 13 females. Of these, 28 were native-born whites, while 9 were foreigners. During the same period, 13 women died of puerperal fever. Of these, 1 was a native-born white, while the other 12 were foreigners. The seasons of greatest mortality from erysipelas were spring and autumn (12 each). The seasons of greatest mortality from puerperal fever were summer and winter (5 each). The month of greatest mortality from erysipelas was November (7). The month of greatest mortality from puerperal fever was January (4).

*Reflections.*—California has a total foreign population of 160,225, from whence it will be seen that more native-born than foreign-born die of erysipelas; while, on the contrary, the deaths from puerperal fever occur almost wholly among the foreign-born. No connection seems to have existed between the two diseases, the greatest mortality from both having occurred at different seasons. It will be noticed, that notwithstanding the dryness of a California climate, both diseases prevail to some extent even at those seasons when the rain-fall is only measured by fractions of inches (summer, for instance). The fact that no death among the Chinese population of the state from either disease is mentioned, is worth remembering.

*EN RESUME.*—With a population of over 17,000,000 people, this western section, of which we have just finished the details, stretches out a gigantic territory, from  $82^{\circ}$  to  $122^{\circ}$  west of Greenwich and spreads over ten degrees of latitude, *i. e.*, from  $35^{\circ}$  to  $45^{\circ}$ . We have given short notes of numerous epidemics of erysipelas and puerperal fever which have occurred from time to time in different portions of this section, often at isolated points.

*Study of the Table.*—The western section just described suffered a total loss, in 1870, of 1,520 persons from erysipelas. As regards sex, 790 of the decedents were males and 730 were females. During the same period, 923 women died of puerperal fever. The season of greatest mortality from erysipelas was spring (456). The season of greatest mortality from puerperal fever was spring (311). The month of greatest mortality from erysipelas was March (173). The month of greatest mortality from puerperal fever was February (106).

*Reflections.*—Both diseases prevailed together at the same seasons. The greatest mortality from puerperal fever, in February, was followed by the greatest mortality from erysipelas in March. The isothermals of  $45^{\circ}$ ,  $50^{\circ}$ , and  $55^{\circ}$  show the mean distribution

of heat through this section during the spring months, the time when the greatest mortality from both diseases occurred. In the western territories which I have not tabulated, 26 deaths occurred from erysipelas. As regards the decedents, 10 were males and 16 were females. Sixteen women died in the territories from puerperal fever also. If these deaths just given, be now added to the table of mortality in the states, the figures, it will be seen, will correspond exactly with the total footings given in the ninth census, and the table is therefore correct.

We shall now proceed to give a general recapitulation of all we have gone over in detail, studying, as we proceed, the natural history of both diseases, the effect of climate, altitude, etc., upon them.

RECAPITULATION.

We have now fully described the 3,162 fatal cases of erysipelas, and the 1,828 fatal cases of puerperal fever, which occurred in the United States in 1870. No general epidemic of either disease seems to have prevailed. Here and there, to be sure, we have noticed what might seem to be small outbreaks at localized points; but, taking all things into consideration, we must consider that the bulk of our cases was sporadic.

We compile the following from table 6, ninth census, showing the months at which the total mortality is noted :

MONTHS.*	ERYSIPELAS.		PUERPERAL FEVER.
	Males.	Females.	
January .....	131	+ 133	183
February .....	153	+ 142	198
March.....	207	+ 144	234
April .....	166	+ 154	201
May.....	169	+ 139	206
June.....	123	+ 111	89
July.....	88	+ 95	95
August.....	107	+ 117	105
September.....	106	+ 121	141
October.....	132	+ 117	122
November.....	122	+ 107	125
December.....	145	+ 132	127
Total.....	3,162		1,828

From this table we see that more men than women die of ery-

\* In the above table there is one death from erysipelas, month unknown, and two deaths from puerperal fever, months unknown.

sipelas. The month of greatest mortality from erysipelas among men was March (207). The month of greatest mortality from erysipelas among women was April (154). The most deaths occurred from puerperal fever in March (234). This same month had also the most fatal cases of erysipelas (351). From the mortality statistics of the eighth census\* (1860), we learn that, "Erysipelas was most destructive in the winter, and then 56 per cent. more than in summer. Winter and spring had similar proportions, and also summer and autumn. May was the most fatal month, exceeding July by 97 per cent." Jarvis says, also, in relation to puerperal fever: "Puerperal fever was also most fatal in winter and spring. This, with the other dangers of childbirth, destroyed nearly one-third its victims in the quarter from January through March, and three-tenths in the quarter next following. Summer was most favorable: its proportion of deaths from these causes being but little more than half of that in the colder season. Autumn was more dangerous than summer, but much less than spring." The conclusions of 1860 were not altogether sustained by those of 1870, although they agree in some few points. The most fatal season in 1870, from erysipelas, was spring; the most fatal month was March. In regard to puerperal fever, the tables of Jarvis, in 1860, are *fully confirmed by my table of 1870.*

NATIVITY.—The nativity of the decedents from both diseases is not uninteresting. A compiled table gives us the following:

NATIVITY.	ERYSIPELAS.	PUERPERAL FEVER.
Native-born whites.....	2,691	1,193
Native-born colored.....	115	206
Indians .....	1	2
Unknown .....	9	2
Germany.....	107	163
Sweden, Norway, and Denmark.....	10	20
Ireland.....	124	174
England and Wales.....	46	19
Scotland.....	15	4
France .....	8	6
North of Europe .....	7	8
South of Europe .....	3	10
All others.....	26	21
Total.....	3,162	1,828

It is very evident that neither our African, European, nor Indian

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\* Mortality and Miscellaneous Statistics. By Edward Jarvis, M. D., Dorchester, Mass. Eighth Census of United States, Washington, 1866, p. 266.

population are entirely exempt from either disease. Our Mongolian population, in the meantime, seems to enjoy a perfect immunity. Our total foreign-born population numbers 5,567,229 persons, of whom 3,096,943 are males and 2,560,286 females. It will be seen, from this statement, that about one out of every 16,000 foreigners dies of erysipelas, and that out of the entire female foreign population, about one out of every 6,000 dies of puerperal fever. The United States has, according to the last census, a total native-born population of 32,991,142. Of these, 16,486,622 are males and 16,504,520 are females; from whence it will be seen that one out of every 12,000 native-born persons dies of erysipelas, and that out of the entire female native population, about one out of every 12,000 dies of puerperal fever. Thus, it is very evident that there is much less erysipelas among the foreign-born than among the native-born; while, on the contrary, at least 100 per cent. more deaths from puerperal fever occur among the foreign-born than among the native-born. Another curious fact is the slight mortality from erysipelas among the colored population. In 1870, our entire colored population numbered 4,880,009 persons, of whom 2,393,263 were males and 2,486,746 females. From this, it will be seen that only one colored person in 39,000 died from erysipelas, and taking the entire female colored population, about one out of every 12,000 died of puerperal fever. The *native white population* of the United States is 28,095,665. Of this number 14,086,509 are males and 14,009,156 are females. From this, it will be seen that one native-born white out of about every 10,500 dies of erysipelas, while one out of every 11,800 native-born white women dies of puerperal fever. It will be seen, from this rough statement, that the colored population suffers less from puerperal fever than the white, and that three whites die from erysipelas where one black dies, taking them at the same relative proportions to the whole population.

This fully confirms Dr. Jarvis' conclusions in regard to the greater prevalence of both erysipelas and puerperal fever among the whites. The tables of 1870 confirm those of 1860. The opinions of Dr. Jarvis, moreover, confirmed those of Major-General Alexander Tulloch, who, for a period of twenty years (1817 to 1826), gives the mortality among the white and colored soldiers stationed in the West Indies, at English military stations. (Refer to Eighth Census, page 281 to 283 inclusive.)

In a general summary\* of the sickness and mortality occurring among white troops during the late war we glean the following, which can be compared with the sickness and mortality from erysipelas and mortality among colored troops. We have arranged the figures in the order they are given in the report. It is left to the reader to work out the difference in the percentage among whites and blacks from the single cause of erysipelas, figures regarding puerperal fever of course being out of the question:

## SICKNESS AND MORTALITY AMONG WHITE TROOPS.

Mean strength in field and garrison, May and June, 1861.....	41,556
“ “ “ general hospitals.....	
Cases of erysipelas.....	65
Deaths.....	3
Mean strength in field and garrison, year ending June 30, 1862.....	279,371
“ “ “ general hospitals.....	9,548
Cases of erysipelas.....	2,652
Deaths.....	120
Mean strength in field and garrison, year ending June 30, 1863.....	614,325
“ “ “ general hospitals.....	45,630
Cases of erysipelas.....	6,728
Deaths.....	812
Mean strength in field and garrison, year ending June 30, 1864.....	619,703
“ “ “ general hospitals.....	55,710
Cases of erysipelas.....	6,507
Deaths.....	412
Mean strength in field and garrison, year ending June 30, 1865.....	574,022
“ “ “ general hospitals.....	71,484
Cases of erysipelas.....	6,456
Deaths.....	494
Mean strength in field and garrison, year ending June 30, 1866.....	99,080
“ “ “ general hospitals.....	2,817
Cases of erysipelas.....	868
Deaths.....	19

Giving a total of 23,276 cases of erysipelas and 1860 deaths therefrom, in an army having a total mean average strength of 431,237 white men in the field and garrison, and 37,038 white men in the general hospitals of the country during the years enumerated. The following additional figures, giving a summary of the cases of erysipelas and mortality therefrom, among the colored

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\* Medical and Surgical History of the War of the Rebellion, Part I, Washington, 1870, p. 636 et seq.

troops of the Federal army. It will be noticed that the records of colored troops do not date back further than July, 1863:

SICKNESS AND MORTALITY AMONG COLORED TROOPS.

Mean strength in field and garrison, year ending June 30, 1864.....	43,952
“ “ “ general hospitals.....	1,222
Cases of erysipelas.....	542
Deaths.....	61
Mean strength in field and garrison, year ending June 30, 1865.....	83,571
“ “ “ general hospitals.....	5,572
Cases of erysipelas.....	666
Deaths.....	161
Mean strength in field and garrison, year ending June 30, 1866.....	55,039
“ “ “ general hospitals.....	1,578
Cases of erysipelas.....	328
Deaths.....	25

Giving a total of 1,536 cases of erysipelas and 247 deaths therefrom, in an army having a total average mean strength of 60,854 colored men in the field and garrison, and 2,791 colored men in the general hospitals of the country, during the years enumerated.

A close study of these tables will enable one to discover that the army records of the late war tend to overthrow the theory that erysipelas is more prevalent among the whites than among the blacks, that is, in *war times*. Without doubt the bulk of all these cases had, for a primary cause, some local lesion in the shape of gunshot wounds, etc., or operations following injuries received in the battle-field. The overcrowding of hospitals, and other causes which might go toward developing any epidemic erysipelatous tendency, had full sway; and it is hardly fair to compare the mortality statistics of an army during time of war with that of an army in time of peace. The soldier who has a leg or arm amputated, as a primary shock, and suffers, in addition, from the secondary shock of an erysipelas of the stump, dying under such a combination of circumstances, the result is not attributed to the accident but to the disease. For this, and for several other reasons, which it is needless to mention at this point, I am inclined to favor the theory, that under all *ordinary* circumstances, erysipelas is much more prevalent among the whites than among the blacks, and that the figures adduced by Tulloch in his English army reports, and by Jarvis from the figures given in the eighth census, together with the statistics regarding the subject compiled by myself from the ninth census,

give ample support to the theory, notwithstanding the figures to the contrary, just quoted from the "History of the War of the Rebellion." It is only fair, however, that the latter should be given.

THE RELATION OF CLIMATE TO THE TWO DISEASES.

In approaching this subject it is necessary to remember that a certain caution and reserve must be maintained. In this connection the wise advice of Jules Rochard\* should not be forgotten. In his elaborate monograph on climate, Rochard remarks: "In order to understand to what slight degree the study of climatology has advanced, it is sufficient to glance rapidly over the globe, and to compare the small number of points we know to the immense extent of new country still to be observed. These obstacles are not those which an individual effort can surmount; these are the facts which are wanting; and, in order to collect them, time, and the patient co-operation of a great number of observers, is necessary. In waiting, that this work may be accomplished, scientific probity makes it a duty to approach these questions only with an extreme caution; for, in hygiene, as in pathology, in all that which touches the study of man, ten gaps are worth more than one error." These remarks of Rochard may apply especially to the United States; for, in the absence of conclusive information, and more voluminous statistics regarding this special subject, and of the effects of climate on erysipelas and puerperal fever, the writer advances, with extreme reserve, the opinions hereinafter expressed.

Let us see, first, whether either of the two diseases has a geographical limit; for, if so, it would seem as if climate must have some effect on them. Says Boudin:† "Every country has its diseases, as it has its flora and its fauna. The diseases, like the plants, have their homes, their stations, their geographical limits." This idea may be true, and it may not be. The diseases to which certain limits have been clearly defined are but few in number; as, for instance, yellow fever, cholera, typhus, and various forms of intermittents. In consulting Boudin further (chap. 3, tome 2, p. 243 et seq., *Statistiques des Maladies Consideres, comme Cause de Décès dans Divers Pays*), we are led to wonder where the

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\* "Climat," *Nouveau Dictionnaire de Médecine and de Chirurgie*, Tome VIII, p. 49 et seq.

† *Traité de Géographie et de Statistique Médicales, et des Maladies Endémique.* J. Ch. Boudin, Paris, 1857.

geographical limits of erysipelas and puerperal fever are. Thus we see that in Iceland, whose northern border touches the imaginary "arctic circle," at  $65^{\circ}$  north latitude, that from 1827 to 1837, according to Boudin's tables, 102 women died from puerperal fever and 6 persons only from erysipelas. At Reykiavik (latitude  $64^{\circ} 08'$ , longitude  $21^{\circ} 55'$ , altitude 50 feet), the mean annual temperature for fifteen years (1823-1837), according to Blodgett, was  $39.3^{\circ}$ . If a low temperature is necessary for the production of erysipelas, most certainly in that case that factor was present, and yet we see only six deaths from erysipelas in ten years. It may be that the heading, "puerperal diseases," does not cover any cases of puerperal fever. This is possible, but not probable; for we see that in Copenhagen (north latitude  $55^{\circ} 41'$ ), and having a mean annual temperature of  $46.6^{\circ}$  F., that from 1840 to 1844, 77 women died from puerperal fever and 26 persons from erysipelas. So much for the extreme northern latitudes. Let us now turn southward.

At St. Helena, south of the 10th parallel of south latitude, and off the western coast of South Africa, we see that in the years 1826, 1827, 1831, 1832, 1833, 1835, that three persons died of erysipelas and five women died of puerperal fever, out of a population of 4,500 persons. It would be interesting to know, in this connection, whether these decedents were native born or not; nevertheless, the fact remains obvious, that in the latitudes of South Africa persons die of both erysipelas and puerperal fever, and this in a tropical temperature. Again, Dr. Rey\* remarks, speaking of the diseases of the Antilles: "Erysipelas is a frequent and endemic disease. It foreruns elephantiasis, which ordinarily progresses by erysipelatous explosions." Again, we are led to wonder where the geographical limits of erysipelas and puerperal fever may be. Leaving to some more able investigator the solution of this problem, we shall look at the two diseases as they are in the United States.

In all climates, from that of Maine, Michigan, and Minnesota, to that of Florida, Louisiana, and southern California, we see that, in every state and territory, erysipelas and puerperal fever prevail to a greater or less extent. That some sections of our country suffer more from one or the other of the two diseases can not be denied. That influences of climate, altitude, and topographical position modify, to a certain extent, the violence of the two diseases in

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\* Article, "Geographie Medicale," Dictionnaire de Medicine et de Chirurgie, Tome XVI, p. 78. H. Rey.

various sections is not to be gainsaid, or else why should there be, under ordinary circumstances, and in the absence of any epidemic tendency, more erysipelas in New England than in the South, and more puerperal fever in the latter, again, than in the former?

Speaking of puerperal fever, Jarvis remarks (Eighth Census, p. 248): "Puerperal fever was fatal in 520 cases, in a ratio of 4.04 per cent., in 1850. It caused the death of 1,202 females—a ratio of .71 per cent. of the total mortality of that sex, in 1860. The ratio varied greatly in the different parts of the country. It was the lowest (25 per cent.) in New England and New York. It was the highest in Mississippi, Louisiana, and Texas, and but little less (1.11 and 1.16 per cent.) in South Carolina, Georgia, Florida, and Alabama, and in Kentucky, Tennessee, and Missouri. It was .92 per cent. in Delaware, Maryland, District of Columbia, Virginia, and North Carolina; and .66 per cent. in Ohio, Indiana, Illinois, Iowa, and Kansas; .42 per cent. in New Jersey and Pennsylvania; and .52 per cent. in the Northwestern States. Climate seems to have a manifest influence in generating this disease. The ratio was more than four times as great in the southern as in the northern Atlantic States, and about two and a half times as great in the Northwest as in the Southwest. In all latitudes, the western ratio was higher than the eastern. In the northern districts this difference was 100 per cent., diminishing toward the south to an excess of about 11 per cent. in the western over the eastern Gulf States. In California, Oregon, and the territories, the ratio was low—.27 per cent. of female mortality," etc.

Taking the 36° of north latitude as a grand central axis, we see that in the states lying north of this parallel there is a population of about 29,500,000; south of this parallel, a population of about 9,000,000. Calculating in the same way, about 2,640 persons died of erysipelas, and 1,312 of puerperal fever, north of 36° of north latitude. Now, taking the difference between these mortality figures and the total mortality, we see that 522 persons died of erysipelas, and 516 persons of puerperal fever in the states lying, for the most part, south of the 36th parallel. On a rough computation, then, one person out of every 11,174 living north of 36° died of erysipelas; while in the same northern division, one woman out of 22,484 of the aggregate population died of puerperal fever. South of the 36th parallel, we see that one person out of every 17,245 died of erysipelas, while one woman out of every 17,441 of the aggregate population died of puerperal fever.

It is seen from this, that a conclusion previously arrived at, in

speaking of the Southern States, is again verified. Taking the 36th parallel, we see that north of it erysipelas increases and puerperal fever decreases. South of 36°, erysipelas decreases while puerperal fever increases. A point here presents itself: Is this decrease of erysipelas in the South due to climatic influences? We have before noticed the comparative immunity of the colored population from erysipelas. When we take into consideration the fact that the bulk of our colored population live in the southern section, we are led to wonder if our southern white population do not suffer just as much from erysipelas as their more northern white friends?

Here is a chance to verify a theory previously advanced. If these descendants of an African slave population, coming from a country whose mean annual temperature is 70° F. and upward—from a country where, although puerperal fever and erysipelas do exist, we have no records of epidemics of these diseases to show, and where we have reason to believe the tendency to erysipelas and puerperal fever is *much less than in temperate latitudes*, is there not reason to believe (we repeat our theory), that these immigrants, coming from torrid climes, brought with them no erysipelatous diathesis, so to speak?

We shall now see what influence heat and cold seem to have on the two diseases as they prevail in the states. For convenience sake we shall take the 40th parallel of north latitude for a boundary line. In the spring months the mean distribution of heat in the states north of the 40th parallel is marked by the isothermals of 40°, 45°, and 50°; while the isothermals of 55°, 60°, 65°, and 70° cross the more southern states. The isothermal of 40° crosses in the neighborhood of Bangor, Maine, while the isothermal of 70° crosses the states near St. Augustine, Florida. In the winter months the mean distribution of heat, north of the 40th parallel, is marked by the isothermals of 20°, 25°, and 30°; while the isothermals of 35°, 40°, 45°, 50°, and 55° cross the south. The isothermal of 20° is near Bangor, Maine, while 55° is near St. Augustine, Florida.

Now, if we take into consideration the fact that, in the *absence of any general epidemic tendency*, both puerperal fever and erysipelas are diseases most prevalent in winter and in spring throughout all parts of the United States, we shall see that a temperature varying from 20° to 70° does not seem to particularly influence either disease—20°, it will be noticed, is the winter minimum, while 70° denotes the spring maximum; the minimum being in the latitude of Maine, the maximum in the latitude of Florida.

If we now look at the mean distribution of heat in summer and autumn, the period of least mortality from both diseases, we shall note the following facts: In summer, the isothermals of 65° and 70° cross the states lying north of the 40th parallel of north latitude, while those of 75° and 80° cross the south—65° crosses in the neighborhood of Bangor, Maine; 80° near St. Augustine, Florida. In the autumn, the isothermals of 45° and 50° cross the states lying north of the 40th parallel, while the isothermals of 55°, 60°, 65°, and 70° cross the southern states—45° crosses in the neighborhood of Bangor, Maine; 70° in the neighborhood of St. Augustine, Florida. Here it will be noticed that the autumn minimum temperature of 45° in northern Maine is faced by the summer maximum of 80° in Florida. It is very evident from all this, that when the mean distribution of heat over the United States ranges from 70° to 80°, that under the influence of this high temperature the tendency toward erysipelas and puerperal fever is checked—that is, in the absence of any epidemics; for local epidemics of both diseases have occurred in summer time, the season of highest temperature, although it may be that the seasons when such local epidemics occurred may have been cold seasons.

Thermometrical observations carefully kept up during times of epidemics, if not at all times, would certainly be valuable in this connection.

It must not be forgotten, in the meantime, that various other influences beside heat seem to modify these diseases. We shall speak of these anon. At this point, to show the temperature at periods of greatest mortality from both diseases, the following table is arranged. The stations of maximum and minimum mean monthly temperature have been selected in each state, at the month the greatest mortality occurred. This statement is based on the census figures of 1870. It will show the extreme ranges of the thermometer during the periods of the greatest prevalence of the two diseases. Let us first take the New England States:

STATIONS.	MONTHS OF GREATEST MOR- TALITY.		MAXIMUM AND MINIMUM TEMPERATURE.			
	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>	<i>Erysipelas.</i>	<i>Puerperal</i>	<i>Fever.</i>	
Maine .....	April.	April.	35°	42°	35°	42°
New Hampshire.	March.	.....	30	33	...	...
Vermont .. .....	September.	April.	53	59	38	42
Massachusetts.....	January.	January.	24	29	24	29
Rhode Island.....	September.	July.	60	63	70	71

At the season of greatest total mortality from both diseases, in New England, the thermometer ranges from 35° to 45° F. A close analysis shows that in Maine and Massachusetts, states in which the diseases prevailed together, the bulk of the total mortality of the New England section is found.

Let us now turn to the Middle States.

STATION.	MONTHS OF GREATEST MORTALITY.		MAXIMUM AND MINIMUM TEMPERATURE.			
	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>	<i>Erysipelas.</i>	<i>Puerperal</i>	<i>Fever.</i>	
New York .. .. .	March.	March.	30°	40°	30°	40°
Pennsylvania.....	April.	May.	49	57	58	68
New Jersey.....	March.	February.	38		30	31
Delaware .....	October.	March.	58		43	

The spring isothermals of this section, during the season of greatest mortality from both diseases, ranges from 45° at the north to 50° at the southern portion of the Middle States.

It will be noticed that in New York State, where the bulk of the total mortality from both diseases in the Middle States section belongs, that both diseases were most prevalent at the same time. The same state of affairs, it will be remembered, existed in the New England section. This fact has a significance, as bearing directly upon the supposed connection of the two diseases in question.

We shall now turn our attention to the southern section of the United States.

STATION.	MONTHS OF GREATEST MORTALITY.		MAXIMUM AND MINIMUM TEMPERATURE.			
	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>	<i>Erysipelas.</i>	<i>Puerperal</i>	<i>Fever.</i>	
Maryland .....	February.	April.	30°	38°	52°	57°
Virginia .....	May.	May.	59	69	59	69
North Carolina...	August.	February.	75	80	43	50
South Carolina...	May.	March.	70	75	56	59
Georgia.....	April.	April.	61	67	61	67
Florida.....	June.	.....	77	81	...	...
Alabama.....	March.	May.	53	62	73	77
Mississippi .....	May.	May.	72	73	72	73
Louisiana .....	May.	March.	68	77	59	64
Texas .....	January.	February.	42	60	46	63
Dist. Columbia...	March.	December.	44	45	31	37

The season of greatest mortality from both diseases, in this southern section, is spring. The isothermals of 50° and 70° cross this section at that season. The difference of temperature during the months of greatest prevalence from both diseases is well marked in this case. We see them both prevailing with a ther-

mometer ranging from a freezing point to that of a tropical temperature.

STATION.	MONTHS OF GREATEST MORTALITY.		MAXIMUM AND MINIMUM TEMPERATURE.			
	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>	<i>Erysipelas.</i>	<i>Puerperal Fever.</i>
Ohio .....	March.	March.	36°	45°	36°	45°
Kentucky.....	August.	April.	73		57	
Tennessee.....	August.	May.	69	78	64	68
West Virginia....	December.	February.	35		34	
Michigan.....	December.	January.	18	27	5	27
Wisconsin.....	February.	December.	18	29	21	23
Indiana.....	February.	March.	28		38	
Illinois.....	March.	March.	35	39	35	39
Missouri.....	March.	August.	32	36	70	76
Arkansas.....	September.	September.	72		72	
Kansas.....	October.	April.	55		55	
Minnesota.....	.....	.....	...	...	...	...
Iowa.....	January.	March.	15	20	32	38
Nebraska.....	.....	.....	...	...	...	...
Nevada.....	.....	.....	...	...	...	...
Oregon.....	.....	.....	...	...	...	...
California.....	November.	January.	41	64	31	56

We see, in this western section, that the season of greatest mortality from both diseases is spring. The isothermals of 45°, 50°, 55°, 60°, 65°, and 70° cross this western section at that season.

It is proved beyond a doubt, I think, that erysipelas and puerperal fever are subject to no particular climatic condition, and that they both prevail, in various sections of our country, at all times and seasons of the year. Nevertheless, that temperature has an agency in modifying the aptitude toward erysipelas and puerperal fever at certain seasons, there can be no doubt. Both diseases have long been classified as winter and spring complaints; that is, under ordinary circumstances, when no general epidemic tendency has manifested itself. It will always be safe to predict, then, in the absence of any general epidemic tendency prevailing in the United States, that local epidemics of both diseases will subside, and that the ordinary mortality rate from both diseases will be diminished at least 100 per cent. in the summer time as compared to winter, when the thermometer shall begin to mark a mean monthly temperature of 70° to 80° F. An axiom: *In the absence of any epidemic tendency, a woman's ordinary chances of escaping puerperal fever are twice as good in summer as in winter or spring.* A theory: A mean monthly temperature of 90° F. would entirely destroy the tendency to either disease. So much for the effects of climate.

We shall now turn to the seeming effects of altitude on both

diseases, using for this purpose some figures from the tables of altitudes published in the recent work of our distinguished countryman, Dr. J. M. Toner,\* of Washington city.

EFFECTS OF ALTITUDE ON THE TWO DISEASES.—Let us now take the average elevation of the different states above the sea-level. The approximated averages are from Toner's tables. For convenience sake I shall arrange the following :

TABLE I.

*States having an altitude of from 50 to 600 feet.*

STATE.	AVERAGE ALTITUDE.	TOTAL POPULATION.	ERYSIPELAS.	PUERPERAL FEVER.
Tennessee .....	600	1,158,520	85	82
Vermont .....	600	330,551	22	5
Kentucky .....	600	1,321,011	93	83
Georgia. ....	575	1,184,109	38	76
North Carolina...	550	1,071,362	52	52
Texas.....	450	818,899	91	86
Massachusetts ....	400	1,457,351	150	51
Maine .....	375	626,915	47	8
Maryland .....	375	780,894	63	19
Alabama .....	375	996,992	51	53
South Carolina....	350	705,606	21	15
Arkansas.....	300	484,471	51	56
Connecticut.....	300	537,454	38	15
Mississippi .....	275	827,922	36	45
New Jersey.....	200	906,096	62	9
Rhode Island.....	125	217,353	21	1
Dist. Columbia....	115	131,700	13	6
Delaware.....	100	125,015	12	1
Louisiana .....	75	726,915	52	24
Florida.....	60	188,248	9	5
Total.....		14,597,384	1,007	692

We see, in these states having an average altitude above the sea-level approximated at 600 feet and under, that one person out of every 14,500 of aggregate population, on a rough estimate, died of erysipelas, while one woman out of every 21,100 of aggregate population died of puerperal fever.

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\* Dictionary of Elevations and Climatic Register of the United States. By J. M. Toner, M. D. New York, 1874.

TABLE II.

*States having an altitude of from 600 to 1,000 feet.*

STATE.	AVERAGE ALTITUDE.	TOTAL POPULATION.	ERYSIPELAS.	PUERPERAL FEVER.
Iowa .....	900	1,194,320	85	42
Wisconsin .....	850	1,064,985	47	31
Missouri .....	800	1,721,295	188	161
Michigan .....	800	1,187,234	106	36
New York .....	800	4,387,464	455	235
Pennsylvania .....	750	3,522,050	282	108
Ohio .....	700	2,665,260	272	112
Virginia .....	700	1,225,163	73	69
Indiana .....	675	1,680,637	183	87
Illinois .....	625	2,539,891	264	149
New Hampshire...	625	318,300	28	6
Total .....		21,506,599	1,983	1,036

We see that in these states having an altitude above the sea-level of from above 600 to 1,000 feet, that one person out of every 10,850 died of erysipelas, while one woman out of every 20,760 of aggregate population died of puerperal fever.

TABLE III.

*States having an altitude of 1,000 feet and upward.*

STATE.	AVERAGE ALTITUDE.	TOTAL POPULATION.	ERYSIPELAS.	PUERPERAL FEVER.
Nevada .....	5,400	58,711	2	2
California .....	2,500	582,031	37	13
Oregon .....	2,000	101,883	5	2
Nebraska .....	1,700	129,322	5	4
Kansas .....	1,350	373,299	46	37
Minnesota .....	1,100	446,056	14	13
West Virginia....	1,050	442,014	37	13
Total .....		2,133,316	146	84

In those states having an altitude of 1,000 feet and upward, that one person out of every 14,600 of population died of erysipelas, while one woman out of every 24,920 of aggregate population died of puerperal fever.

*Conclusions.*—A more concise statement, as regards the influence of altitude, will be seen in the following table:

ALTITUDE.	DEATHS FROM ERYSIPELAS.	DEATHS FROM PUERPERAL FEVER.
50 to 600 feet.....	1 to 14,500	1 to 21,100
600 to 1,000 feet.....	1 to 10,850	1 to 20,760
1,000 to 5,500 feet.....	1 to 14,600	1 to 24,920

It will be seen, at a first glance, that the higher the altitude the less seems to be the tendency toward either disease; that is what we would be led to infer from reading this statement. It must not be forgotten, however, that all the large cities in the United States, which largely swell the mortality list from puerperal fever, have none of them an elevation of 600 feet, although in this statement, taken from Toner's tables, the average of the states alone is given, and such cities as New York (altitude 50 feet), Philadelphia (altitude 50 feet), Boston (altitude 110 feet), St. Louis, Chicago, Cincinnati, and New Orleans, which have an elevation of less than 600 feet, are classified along with the states having an elevation of from 600 to 1,000 feet above the sea-level. The dense population in the states included in Table II. must also be taken into consideration, as likewise the widely separated and isolated population included under Table III. From a careful consideration of this subject I am forced to the following conclusions:

1. *That altitude rather favors the development of any erysipelalous tendency that may exist.*

2. *That altitude tends to diminish the tendency toward puerperal fever.*

The influence of altitude on diseases accompanied by cutaneous symptoms finds no better example than that afforded by the census tables of Nevada, in 1870. In this state, having an average altitude of 5,400 feet, almost one-fourth of the total mortality was from scarlet fever.

HYETAL INFLUENCES.—It was the intention of the writer to have noticed the influence of the wet, as compared with the dry seasons, upon the two diseases under discussion. For this purpose new tables had to be arranged. In the absence of more accurate information, these tables were so incomplete as to discourage any further investigation in this line—the tables would have been too voluminous for insertion in this short article. From the only table which I fully completed, which was one for the New England section, I am inclined to think that *both diseases prevail whether the season be wet or dry, and that they are not subject to any particular law in this respect.* However, as I before remarked, the incomplete and unsatisfactory mode of examination I pursued will not justify me in reasserting the conclusion I arrived at from the investigation of a single section. To the future student of the two diseases I leave the study of this truly important problem of hyetal influence, as well as that of hygrometric influences.

AGE AT WHICH THE GREATEST MORTALITY OCCURS.—From table 5 (pp. 18, 19) of the Ninth Census, I have compiled the following table:

TABLE I.

*Showing the age of the decedents from erysipelas.*

AGE.	MALES.	FEMALES.
Age unknown.....	3	...
Under 1 year.....	529	475
1 year.....	92	90
2 years.....	42	52
3 years.....	20	29
4 years.....	12	15
5 to 20 years.....	147	144
20 to 50 years.....	313	280
50 to 95 and over.....	492	427
Total.....	1,650	1,512
		<u>1,650</u>
Grand total.....		3,162

From this table it is easy to see that *infancy* and *old age* are the periods of life when the human being is most apt to become the victims of erysipelas. It has long been held, by most medical writers, if I be not mistaken, that erysipelas was a disease more liable to attack the young and the aged than those in the prime of life. This conclusion was no doubt arrived at from a study of mortality statistics. I do not believe that such is the case myself. The truth is, that infancy and old age offer the least *resistance* to violent attacks of any kind of disease; and because these periods of life show the greatest number of victims from erysipelas, it is no proof that infants and the aged are more susceptible to that disease than those in the prime of life. The army statistics before given, showing the frequency of the disease among the troops of the United States army during the "late misunderstanding," amply corroborate this statement.

TABLE II.

*Showing the age of the decedents from puerperal fever.*

Age unknown.....	2
10 to 15 years.....	3
15 to 20 years.....	165
20 to 25 years.....	451
25 to 30 years.....	405
30 to 35 years.....	335
35 to 40 years.....	270
40 to 45 years.....	158
45 to 50 years.....	28
50 to 55 years.....	7
55 to 60 years.....	4
Total.....	<u>1,828</u>

I shall not enter into any discussion regarding the age at which puerperal fever is most prevalent at this point. The table is inserted here merely to keep up the connection of the subject and as a matter of permanent record.

We shall now turn to the consideration of an epidemic of puerperal fever which occurred in this county (Hamilton) during the year just passed. The conclusions to be drawn from that epidemic, and a study of the tables we have just finished, furnish the basis for our argument, "Regarding a late epidemic of puerperal fever, with an inquiry into the connection said to exist between puerperal fever and erysipelas."

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#### SECTION FOURTH.

REGARDING EPIDEMIC PUERPERAL FEVER AND EPIDEMIC ERYSIPELAS,  
AS THEY PREVAILED TOGETHER IN THE CITY OF CIN-  
CINNATI DURING THE YEARS 1872-73.

Situated in what is known as the Miami Valley, in the extreme southwestern corner of the State of Ohio (latitude  $39^{\circ} 06'$ , longitude  $84^{\circ} 29'$ , altitude 543 feet above tide-water), is the city of Cincinnati. According to Dr. Drake, Cincinnati was first made a settlement on the 26th of December, 1788. Says our illustrious authority: "The site of the city, on the left bank of the Ohio river, consists of two plains or bottoms—one near the river, comparatively narrow, and composed of argillaceous alluvion; the other in its rear, six or eight times as broad, diluvial, and made up, like the higher or second terrace generally, of pebbles, gravel, and sand, with a covering of loam and soil. The lower plain widens as it stretches down the river, and its back part, on the settlement of the town, was a narrow, shallow, and heavily timbered pond or swamp, overflowed by ordinary spring floods of the river, which ascended upon it along the marshy rivulets by which that tract was partially drained into the Ohio, below the town. In 1793 the whole of the lower plain was submerged; and in 1832 and 1848 the inundation was repeated, upon every part which had not been raised with materials washed by the rain or hauled from the adjacent high terrace. For many years after the settlement of the village the drainage of both terraces was in the low grounds of this bottom, where it accumulated in part upon the surface, and partly in the numerous pits formed by the manufacture of brick. . . .

From the lower plain to the upper and older, the ascent is between fifty and sixty feet. With the growth of the town the front margin of the latter, which was originally a bluff bank, has been graded to a gentle declivity, and the removed material used, as already intimated, to raise the back part of the lower bottom; so that the drainage of the city is now chiefly by the streets directly to the river. The upper terrace, as was the case with the lower, slopes back from its southern or river margin, and, at the average distance of a mile, terminates against the base of the Mt. Auburn range of blue Silurian limestone hills; whence, during rains, there descend upon it several torrents, which coalesce and flow nearly in the same direction with the river. To the east, this terrace is terminated by the narrow valley of a hill torrent called Deer Creek. Beyond this ravine stands Mt. Adams, between the base of which and the eastern margin of the city terrace the low ground has been raised above the highest river floods. . . . The Western Canal, from Lake Erie, generally called the Miami Canal, traverses the back part of the upper terrace, from northwest to southeast," etc.

It would not perhaps be necessary to speak of the topography of the city at all, were it not for the fact that these epidemics were clearly localized. At this point, for certain reasons, I shall only give the locality of the puerperal fever epidemic.

There were three groups of cases, the first of which occurred in the "West End," that western portion of the city which is most exposed to the prevailing southwest winds, which come to it over what is known as "Millcreek Bottom," a tract of lowlands which are extremely marshy, owing to the backwater from the Ohio river, that at intervals submerge many acres during its periodic risings. If a map of the city of Cincinnati be taken and spread upon a table, and a tape-line placed upon the point marked Findlay and John streets, and from thence a straight line be drawn to the corner of Cutter and Seventh, and from thence a line running directly westward to Freeman street, and then southward to the Ohio river, including that district lying directly west of the Indianapolis Railroad track, the eastern limit of the "West End" epidemic of puerperal fever can be tracked by its mortality record. Twenty-seven deaths occurred in this group, not counting, however, the deaths occurring at Warsaw and Fairmount, points lying west of Millcreek. An almost complete line of demarcation exists between

this group and the second group. The connecting link, if there be any, is the Cincinnati Hospital.

The second group of cases must have occurred, judging from the mortality, within the following limits: A line running from Quarry and Poplar streets to Fourteenth street and the Miami Canal, then southward along the canal to North Canal street, thence eastwardly on a line with North Canal and Hunt streets to Pendleton street, north on Pendleton street to Liberty, thence a line drawn from the corner of Liberty and Pendleton to Quarry and Poplar streets. Within these boundaries 28 deaths from puerperal fever occurred during the epidemic.

The third group of cases includes those occurring on Mt. Adams.

It will be at once noticed that these three groups of cases are isolated from each other; also, that the central and southern portions of the city were almost exempt from the disease. In the three groups named, the total mortality was 60. How many cases would this probably represent? From figures in my possession, regarding the duration of last illness of the various decedents, I am led to infer that the form of the disease was not of the most malignant character, and that the mortality rate was exceedingly light for such a disease as puerperal fever. I think that it would be fair to estimate the mortality, as compared to the whole number of cases, to be about 25 per cent. This would give about 240 cases to the two principal groups.

If the topographical sketch of Cincinnati, as quoted from Drake, will be recalled, it is seen that the "West End" group of cases occurred, for the most part, in that portion of the city overlooking the marshes and ponds of the Millcreek bottom-lands. The second group of cases was on the back portion of the upper terrace, having the canal in front of it and the limestone bluffs of Mt. Auburn at the rear. The third group of cases occurred on Observatory Hill (Mt. Adams), one of the highest points in the city, it being about 300 feet higher than the upper terrace.

Where was the heaviest mortality from erysipelas in the meantime? Taking a chart which has the puerperal-fever districts mapped out on it, we now locate, by dottings, the point at which each death from erysipelas occurred. In this way it is easy to discover whether the two diseases existed together or whether they were isolated from each other.

We see the following condition of affairs: During the time puerperal fever was prevailing, erysipelas seems to have also been

epidemic, and a mortality of 20, at least, is noticeable in the districts infected by puerperal fever. When the slight mortality rate from erysipelas is remembered, it will be seen that these 20 deaths must have represented a large number of cases. It is a fact worthy of record, then, that the neighborhoods suffering most from puerperal fever suffered also to the greatest degree from erysipelas; and it is also a fact that the scattering deaths from puerperal fever occurred in the immediate vicinity of the scattered cases of erysipelas. To be more explicit, *both diseases were most prevalent in the same localities.*

Let us now look at the two diseases as they had prevailed in this city for several years previous to the epidemic.\*

From November 9, 1865, to December 31, 1866, 12 women died of puerperal fever. The average age of 11 of the decedents was about 30 years. As regards nativity, 6 were native born, 4 were Irish, and 2 were Germans. During the same year there were 11 death from erysipelas (6 males, 5 females); 8 of these decedents were children and 3 adults. The deaths from both diseases occurred in different portions of the city, and no connection seems to have existed between them.

In 1867, there 18 deaths from puerperal fever. Of these, 14 were Germans, 1 was Irish, and 3 were native born. The average age of the 18 decedents was 30 years. During the same period there were 8 deaths from erysipelas (5 males and 3 females). No connection seems to have existed between the two diseases.

In 1868, there were 16 deaths from puerperal fever. Of the decedents, 10 were Germans. The average age of 15 of the decedents was 31 years. During the same period 18 persons died from erysipelas (13 males and 5 females). Of these one-half were infants. No connection seems to have existed between the two diseases.

In 1869, 10 women died of puerperal fever. Of these, 7 were Germans, 1 was Irish, and 2 were native born. The average age of the decedents was 30 years. During the same year 14 persons

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\* The figures given in these tables will probably not coincide with the "Health Office Reports" of this city, published prior to 1873, for this reason: It was necessary, in order to study the location of every case, to go over a death-registry which contains upward of 35,000 names. Sometimes a death-certificate would lack the name of the street on which the death occurred, or even the ward. In such a case, or where, from other circumstances, the certificate seemed to be doubtful, I have thought best to omit it. The cases here tabulated can be considered as being very nearly a correct list.

died from erysipelas (10 males and 4 females). All but 3 of the decedents were adults. No connection seems to have existed between the two diseases. In April of this year we notice a death-certificate signed by Dr. — (a case of puerperal fever), and the May following, another certificate for a puerperal fever case, signed by the same physician. These two cases occurred in the same locality. The question of the transmission of the disease might arise here, but let it pass as a probable coincidence.

In 1870, 14 women died of puerperal fever. Of these, 5 were Germans, 4 Irish, 1 was French, and 4 native born. The average age of the decedents was 32 years. During the same time 19 persons died of erysipelas (14 males and 5 females); 8 of these were infants, the rest were adults. No connection seems to have existed between the two diseases. Dr. — lost two cases of puerperal fever in February of this year. Both cases, we notice, died the same week. These two cases occurred at remote points. Here, again, the question of transmission of the disease by the physician arises. In the absence of absolute information we conclude that the occurrence of these two deaths was merely a coincidence.

In 1871 (year of the small-pox epidemic), 10 women died of puerperal fever. Of these, 4 were Germans, 2 were Irish, and 4 were native born. The average age of 9 of the decedents was 27 years. During the same period 12 persons died of erysipelas (5 males and 7 females). Of these, 9 were infants. No connection seems to have existed between the two diseases.

In 1872, early in this year an epidemic tendency toward erysipelas and puerperal fever was noticed. In March, quite a number of deaths from erysipelas occurred, some of them in the Cincinnati Hospital. No deaths from puerperal fever are noticed in February or March of this year; but in April, the month following the commencement of the erysipelatous tendency, there were five deaths from puerperal fever. As the weather became warmer and drier, the tendency toward puerperal fever seemed to have subsided, and in July we notice only one death, while the fall month of September had likewise one death recorded from puerperal fever. All during the summer a tendency toward erysipelas seemed to linger; and judging from the number of deaths occurring at the Cincinnati Hospital in the first and second quarters of the year, a decided epidemic tendency must have been noticed in that institution. We also notice two deaths occurring from erysipelas neonatorum, on Church street, in the month of July. These

cases were attended by Dr. —, a homeopathic physician. In the month of September but one death from erysipelas is recorded; in October, two deaths; in November, the commencement of the epidemic we are about to notice, five persons died from erysipelas. During the months of November and December, 1872, then, *puerperal fever and erysipelas prevailed together as epidemics.*

In 1872, 40 women died from puerperal fever. Of these, 16 were Germans, 5 were Irish, 1 was English, and 18 were native born. The average age of the 40 decedents was 28 years. During the same year 43 persons died of erysipelas (23 males and 20 females). Of these decedents, 18 were children.

The following tabular statement will give an idea of the two diseases as they have prevailed in Cincinnati for some years past, and up to, and including, the first two months of the epidemic:

TABLE I.  
*Showing mortality from puerperal fever from 1866 to 1873.*

YEAR.	SPRING.			SUMMER			AUTUMN.			WINTER.			YEAR. Total.
	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	
1866.....			3	1		1	2	1		3	1		12
1867.....		1		1	1	2	1	1	3	3	1	4	18
1868.....	2	3	1		1	1	1	1	1		3	2	16
1869.....	1	2	1	1	1			1	1			2	10
1870.....	3	1	1	1	2	1			1	1		3	14
1871.....	3	3			1		1			1		1	10
1872.....		5	1	4	1	2	1	1	6	16	3		40
Total....	9	15	7	8	7	7	6	5	12	24	8	12	120

The slight mortality, for some years before the epidemic, from puerperal fever, in this city, having an estimated population of 250,000 persons, is worthy of note; as is also the increase in the same ratio as puerperal fever of the erysipelas mortality, during the same period, as exhibited in the following table:

TABLE II.

Showing mortality from erysipelas from 1866 to 1873.

YEAR.	SPRING.			SUMMER.			AUTUMN.			WINTER.			YEAR.
	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	
1866.....	1			1	1			1	3	3	2		11
1867.....	1	1		1	2			1	1	1	1		8
1868.....	3	1	1		1	2	2	1	2	2	1	2	18
1869.....	3	3			1		1	2		2	1	1	14
1870.....		4	3	3	1	1		1	3		1	2	19
1871.....				2	1			1		2		5	12
1872.....	7	2	3	3	4		1	2	5	10	3	3	43
Total...	15	11	7	9	11	3	4	9	13	20	10	13	125

No better illustration of the connection of the two diseases can be needed. Here we see an *increase in erysipelas* followed by the *outbreak of puerperal fever*.

Before entering more fully into the details of this epidemic, I shall briefly refer to the nativity of the decedents from puerperal fever during the period previously noted :

TABLE III.

Showing the nativity of the puerperal-fever decedents from 1866 to 1873.

NATIVITY.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	Total.
American .....	6	3	1	2	4	4	18	38
Irish.....	4	1	4	1	4	2	5	21
German .....	2	14	10	7	5	4	16	58
English .....			1				1	2
French .....					1			1
Total.....	12	18	16	10	14	10	40	120

The mortality among the German population alone is seen to be almost as much as that of all other nationalities, including our own. Not only is this the case, but if the death-certificates be carefully examined, the larger portion of the *native-born* decedents show that they are of German extraction, judging from the Teutonic names and other signs. The decedents from erysipelas are, many of them, Germans or of German extraction likewise.

Let us now look at puerperal fever as it prevailed in 1873. In January there were 22 deaths; February, 16; March, 12; April, 9; May, 7; June, 2; July, 3; August, 2; September, 2; October, 2; November, 2; December, 3—making a total of 82 deaths from puerperal fever in 1873. During the same year 28 persons died of erysipelas. If we now add the victims who perished in November and December, 1872, we find a total mortality from puerperal fever, 104; from erysipelas, 43. These are the mortality figures of the epidemic of 1872-73.\*

For the purpose of giving the daily mortality, and the meteorological observations made during the time of the epidemic, I append the two following additional tables. Table IV. was kindly compiled for me by Mr. Chapman, clerk of the Board of Health. Table V. is the meteorological records furnished to the Health office by the United States signal office at this station.

TABLE IV.

*Mortality from puerperal fever, peritonitis, convulsions, and erysipelas for 1873.*

Date.	Puerperal Fever.	Puerperal Peritonitis.	Puerperal Convulsions.	Erysipelas.	Total.	Date.	Puerperal Fever.	Puerperal Peritonitis.	Puerperal Convulsions.	Erysipelas.	Total.	Date.	Puerperal Fever.	Puerperal Peritonitis.	Puerperal Convulsions.	Erysipelas.	Total.
Jan. 1				1	1	Feb. 19	1	*			1	May 21	1				1
2	1			1	2	20	2				2	22					1
3				1	1	21	1			1	3	June 11					1
8		1		1	1	24	1			1	4	16					1
9		2		2	4	26				1	6	18	1				1
10	2			2	4	Mar. 4	2			2	8	22					1
11	1	1		2	4	12	1			1	9	23		1			1
14		1		1	2	13	1			1	10	July 7		1			1
15		1		1	2	14	1			1	11	10	1				1
16		2		2	4	18		1		1	12	15	1				1
18	1			1	2	20	1	1		2	13	19					1
21		1		1	2	21	1	1		1	14	22					1
22	1			1	2	22	1			1	15	Aug. 2	1				1
25				1	1	25	1			2	16	24			1		1
26				1	1	31	1			1	17	Sept. 4	1				1
27	1			1	2	Apr. 3	1			1	18	11	1				1
28		2		2	4	8				2	19	Oct. 2		1			1
29		2		2	4	9		1		1	20	6					1
30		1		1	2	10	1			1	21	7		1			1
31		1		1	2	17		1		1	22	Nov. 7	1				1
Feb. 4				1	1	23		1		1	23	10	1				1
5	3			3	6	25		1		1	24	20					1
6		2		2	4	26	1			1	26	Dec. 7	1				1
7		1		1	2	27	1			1	27	13		1			1
8				1	1	29	1			1	28	16		1			1
9	1			1	2	May 1				1	29	17					1
10	1			1	2	3		1		1	30	20					1
11				1	1	4	2			2	31	Nov. 10					1
14	1			1	2	7	1			2	1	20					1
17		1		1	2	14		2		2	2	Dec. 7	1				1
18	2			2	4	20				1	3	Total.	48	34	2	28	112

\* "No month was free from fatal cases of puerperal fever, though the greatest mortality occurred in the months of January, February, and March. The total deaths from puerperal fever were 82, a number equal to the total previous mortality from the same cause since the organization of the present board of health, in April, 1867." Vide "Seventh Annual Report of the Board of Health," p. 33, J. J. Quinn, M. D., Health Officer, Cincinnati, 1874.

TABLE V.

*Meteorological record for the year 1873, at Cincinnati.*

Week ending 1873.	Mean Temperature.	Mean Barometer.	Mean relative Humidity.	Amount of Rain or Melted Snow, In.	Prevailing Winds.	Velocity of Wind, Miles in an Hour.	State of Weather.	Av. Weekly Stages of Ohio River.
January	4	40.25	30.060	69.56	.58 N. S. & W.	1 to 16	Two rainy days.	20.60
	11	26.28	30.257	75.54	.31 N. W. & S.	2 to 25	1 rainy day; clear & fair.	26.80
	18	36.96	29.769	74.78	.80 W.	2 to 16	4 rainy days; cloudy.	17.10
February	25	36.10	30.055	74.78	.85 W. & S. W.	0 to 17	6 rainy days.	26.80
	1	22.71	30.625	72.64	.13 N. W. & N.	0 to 16	2 rainy days; fair & clear.	19.80
	8	40.43	29.930	72.39	.86 N. S. & S. W.	0 to 17	1 rainy day; fair & clear.	20.00
March	15	35.78	30.091	77.60	.52 N. S. & W.	0 to 16	3 rainy days.	29.20
	22	37.86	29.977	70.10	1.57 N. W. & S.	0 to 16	3 rainy days.	38.70
	1	28.88	30.118	75.60	1.54 N. W. & W.	0 to 19	3 rainy days.	31.30
April	8	35.07	30.365	65.07	.20 N. & N. E.	2 to 20	4 rainy days.	16.10
	15	47.53	30.060	53.92	.49 N. W. & S. E.	0 to 28	3 rainy days.	14.40
	22	44.84	30.013	58.46	.31 N. W. & N.	0 to 20	2 rainy days.	20.10
May	29	40.68	29.859	68.71	1.28 N. E. & S. W.	4 to 20	5 rainy days.	30.50
	5	56.86	29.851	57.25	.51 S. W. & S.	1 to 22	2 rainy days.	37.11
	12	57.21	29.952	63.07	1.37 W. & N. W.	1 to 20	4 rainy days.	30.90
June	19	51.75	29.892	62.21	.53 S. E. & E.	1 to 16	4 rainy days.	32.00
	26	47.43	29.964	59.50	.19 N. E. & N. W.	0 to 22	3 rainy days.	24.50
	3	57.39	29.858	61.68	1.05 S. W. & E.	1 to 16	4 rainy days.	19.80
July	10	62.89	29.953	61.39	1.50 N. E. & E.	0 to 16	4 rainy days.	32.00
	17	62.94	29.897	54.42	.02 N. E. & S. E.	1 to 16	2 rainy days.	33.70
	24	73.46	29.878	59.39	.42 N. E. & S.	1 to 14	4 rainy days.	20.00
August	31	70.86	30.013	62.59	.85 N. & S. E.	0 to 12	2 rainy days.	18.80
	7	76.36	29.976	63.17	.02 E. & S. E.	1 to 14	1 rainy day.	12.30
	14	73.53	29.971	62.18	1.53 E. & S. E.	0 to 16	4 rainy days.	9.10
September	21	79.14	29.913	56.89	.00 W. & S. W.	0 to 15	Clear and fair.	8.40
	28	81.61	29.993	63.86	1.26 S. E. to S. W.	7 to 10	3 rainy days.	7.60
	5	79.04	29.885	65.00	2.04 S. to W.	0 to 12	5 rainy days.	9.10
October	12	74.57	29.999	62.14	.20 N. & N. E.	0 to 13	2 rainy days.	17.70
	19	79.50	30.023	65.79	1.39 S. & S. W.	0 to 16	4 rainy days.	13.00
	26	76.61	30.076	60.93	.14 N. W. & E.	1 to 12	3 rainy days.	14.30
November	2	78.96	30.008	70.32	2.07 S. E. & S.	1 to 12	5 rainy days.	9.80
	9	75.71	30.109	62.54	.72 S. E. & E.	1 to 13	2 rainy days.	11.50
	16	75.39	29.974	67.68	1.44 N. & N. E.	1 to 14	3 rainy days.	9.00
December	23	74.68	30.059	64.89	.00 N. E. & N.	1 to 10	Foggy; clear and fair.	9.30
	30	76.93	30.038	70.18	1.41 N. E. & E.	1 to 12	2 rainy days.	10.10
	6	76.18	30.015	58.43	.08 N. & W.	0 to 15	1 rainy day; fair.	11.00
January	13	69.14	30.121	59.93	.05 N. E. & S. W.	0 to 16	3 rainy days.	7.40
	20	64.29	30.068	52.96	.45 N. W. & S. E.	0 to 15	1 rainy day; fair & clear.	5.50
	27	64.21	30.048	72.82	1.39 S. E. to S. W.	0 to 13	3 rainy days.	4.30
February	4	63.32	30.083	64.14	.72 N. E. & S.	1 to 17	2 rainy days.	3.10
	11	56.14	30.096	59.00	.39 S. E. & W.	0 to 19	2 rainy days.	3.10
	18	60.39	30.226	62.21	.40 S. to S. E.	0 to 12	1 rainy day; fair & clear.	3.10
March	25	48.43	30.102	59.00	.39 S. E. & W.	0 to 19	2 rainy days; fair & clear.	5.80
	1	41.50	30.106	70.11	.83 S. E. & S. W.	0 to 18	3 rainy days.	21.00
	8	48.21	30.148	67.47	.27 N. & N. E.	0 to 12	4 rainy days.	18.00
April	15	41.11	30.008	62.43	.00 N. W. & W.	1 to 16	Fair and clear.	10.30
	22	37.86	29.860	67.47	.46 S. W. & S. E.	1 to 16	3 rainy days.	12.00
	29	37.75	30.048	72.96	1.77 N. W. & W.	2 to 14	3 rainy days.	19.70
May	6	43.43	30.255	68.75	2.61 N. E. & S. E.	2 to 22	3 rainy days.	25.10
	13	46.75	30.152	79.11	2.56 N. E. & S.	2 to 17	7 rainy days.	30.50
	20	40.75	30.196	74.57	.18 S. E. & W.	1 to 11	1 rainy day; cloudy.	40.50
June	27	38.77	30.089	69.57	.12 N. E. & E.	0 to 16	2 rainy days.	25.50
	31	38.21	30.181	68.68	.00 S. W. & W.	5 to 13	Fair and cloudy.	15.20

Barometer corrected for temperature, elevation above the mean level of the sea, and instrumental error.

Rainy day signifies a fall of at least .01 of an inch of rain or melted snow.

Mean barometer for year, 30.0314 inches.

Mean temperature for year, 56 deg.

Highest temperature of year, June 23.

Lowest temperature of year, January 30 and March 4.

Total amount of rain and melted snow, 41.38 inches.

Prevailing direction of wind, southwest.

Heaviest rain-fall in any month of year was in December.

Low water mark in the Ohio river indicates 20 inches of water in the channel.

The nativity of the decedents from puerperal fever, from January 1st to July 31, 1873, at which time the epidemic subsided, was as follows:

United States.....	24
Ireland.....	7
Germany.....	38
France.....	2
Total.....	71

At least thirty per cent. of those born in the United States were of German extraction, as indicated by their names and their residence in the German quarters of the city. The most of the erysipelas mortality was among the Germans and persons of German extraction.

It is possible that some of our physicians may not believe in the connection of the two diseases. I am led to infer this from the fact that several of our most highly educated physicians seem to have been in attendance upon puerperal-fever and erysipelas cases at the same time. Some physicians, also, seem to have had no fear of attending *several* puerperal-fever cases at the same time. A careful study of the *death-certificates* shows some curious things. Perhaps we may be wrong in drawing inferences from noticing such curious coincidences as the following:

Dr. A. Loses a patient from puerperal fever on the — of July; duration of illness, 8 days. Six days afterward, another “death-certificate”—puerperal fever; *duration of illness, 8 days*. On August —, “death-certificate,” from erysipelas. Four days afterward, “death-certificate,” from puerperal fever; *duration of illness, 6 days*. It is needless to say that Dr. — lost other cases from both diseases. I infer only from the death-certificates that he is not a believer in either the contagiousness of puerperal fever or in the connection of the puerperal-fever poison with that of erysipelas.

Dr. B. On February —, a “death-certificate,” from puerperal fever; duration of illness, 8 days. Three days afterward, a “death-certificate,” from erysipelas. The deaths from erysipelas and puerperal fever occurred a few doors from each other, as was also the case in Dr. A’s case. It is useless to remark that Dr. — lost other cases from both diseases; and it is very evident he is not a believer in the connection of the two disease—at least he seems to have attended cases of erysipelas and puerperal fever at the same time.

Dr. C. April —, "death-certificate," from puerperal fever; duration of illness, 3 days. Seven days after, "death-certificate," from puerperal fever; duration of illness, 8 days. Dr. — lost other patients.

I might go on, and show cases, belonging to other physicians, of the same kind.

It is a sad commentary on this last epidemic, that a few men, who attended cases of erysipelas and puerperal fever promiscuously, should have been most unfortunate in their practice. On the contrary, we notice some physicians, having a large practice, who lost not more than one or two cases of puerperal fever, and no erysipelas cases at all. I think the majority of our physicians refuse to attend confinement cases when they have erysipelas or puerperal fever cases on their hands.

I have used fictitious initials for these *unfortunate* physicians. It is barely possible that my inferences may be incorrect; but I most certainly think, from the study of the death-certificates, *that there is a connection between puerperal fever and erysipelas*. It is a delicate matter to mention such cases; but it is a warning which may benefit physicians in the future, and possibly save the lives of some women.

**DURATION OF LAST ILLNESS.**—It is generally admitted that patients suffering from puerperal fever have a change for the better or worse before the ninth or tenth day; and if they die, it is before the tenth day, as a general rule.

From a study of the death-certificates, dating from January 1 to July 31, 1873, I have made the following analysis. (In some cases the death-certificates are filled out incompletely, and I shall be only able to give a partial list.)

In January, the average duration of illness of 21 of the decedents was  $8\frac{1}{2}$  days. The duration of the shortest period of illness was 3 days; the longest period was 28 days.

In February, the average duration of illness of 15 of the decedents was  $8\frac{1}{3}$  days. The duration of the shortest period of illness was 4 days; the longest period was 21 days.

In March, the average duration of illness of 11 of the decedents was 7 days and a fraction. The duration of the shortest period of illness was 55 hours; the longest period was 14 days.

In April, the average duration of illness of the 9 decedents was

6 days and a fraction. The duration of the shortest period of illness was 3 days; the longest was 14 days.

In May, the average duration of illness of the 7 decedents was 12 days and a fraction. The duration of the shortest period of illness was 5 days; the longest period was 21 days.

In June, the average duration of illness of the 2 decedents was  $38\frac{1}{2}$  days. The duration of the shortest period of illness was 21 days; the longest period was 56 days.

In July, the average duration of illness of the 3 decedents was  $15\frac{1}{3}$  days. The duration of the shortest period of illness was 8 days; the longest period was 1 month.

The average duration of illness of these 68 puerperal-fever decedents was then 9 days and a fraction.

The effects of a high temperature on the disease is here manifest. The study of the meteorological table for the period given is not uninteresting. By keeping the temperature of a puerperal-fever ward up to 90° F. an interesting experiment might be made; *i. e.*, to see whether or not a high temperature be beneficial in cases of puerperal fever.

AGES OF THE PUERPERAL-FEVER DECEDENTS.—It is a matter of regret that no record was kept whether these patients were primiparæ or multiparæ; for it is claimed that women with their first child are twice as prone to suffer from attacks of puerperal fever as are those who have borne several children. The ages of the 71 decedents (dating from January 1 to July 1, 1873) amounted, in the aggregate, to 2,035 years. This would give an average age of 28 years, indeed almost 29 years. As the majority of women marry by the time they are twenty-five, I am of the opinion that more multiparæ than primiparæ died during this epidemic; however, this is only a mere matter of surmise, and may not be correct. Four of the youngest decedents were colored women, the oldest being only twenty years of age. These four were most likely primiparæ. The youngest decedent during the whole period of the epidemic was a colored woman, aged sixteen years. The oldest decedent was an Irishwoman, aged forty-seven years.

It is a fact worthy of mention, that the first death of puerperal fever in the present epidemic seems to have been associated with one from erysipelas. In this case, however, the physician in attendance was not to be held responsible. November 5, 1872, we see a "death-certificate," from puerperal fever, on Eighth street.

The certificate is signed by Dr. ——. On November —, a "death-certificate," from erysipelas. This shows that a female infant, seventeen days old, died of erysipelas in the same house as our puerperal-fever decedent. This certificate is also signed by the same physician. Here is evidently one of those cases where the infant has been either born with the germs of a disease inherent in it, from which its mother died, or has, after its birth, contracted a contagious disease from its mother. In the case of the woman, the germs developed into what we call puerperal fever; in the case of the child, into what we call erysipelas. Here, evidently, notwithstanding the difference in the type of the two diseases, *they were dependent on a common poison*. Cases of a similar kind are not unusual during epidemics of puerperal fever, so that we can not regard them as mere coincidences when they do occur.

*Is there a connection between puerperal fever and erysipelas?* If, after the mass of figures we have waded through, we have not been able to learn something regarding puerperal fever and erysipelas it would be surprising. The study of the census tables of 1870, although they fail to give many decided signs of the connection between puerperal fever and erysipelas, still teach a valuable lesson. It is this: *In any place where erysipelas is found, there will be found puerperal fever*. In the absence of more minute particulars than are furnished by the census tables, we are constrained to only give a general conclusion. This conclusion is based on the following propositions:

1. *Erysipelas and puerperal fever seem to prevail together throughout all the states.*

2. *Any marked increase in any one locality of one disease, seems to be accompanied by a corresponding increase of the other.*

3. *Where histories of past epidemics of either disease are obtainable from any of the states, the seeming connection of the two diseases was noticed by physicians at the time of such epidemics, and remarked on.*

4. *For these reasons we are, I think, justified in concluding that there is an intimate connection existing between puerperal fever and erysipelas.*

If we now study the tables of the late epidemic in this city, we can further strengthen our belief, and arrive at an even more definite conclusion in regard to this subject, by basing ourselves on the following propositions:

1. *The two diseases prevailed as epidemics, at the same time, in the same localities.*

2. *Where an isolated death from puerperal fever was noted, outside of the infected districts, a corresponding death from erysipelas was noted in the same locality. This was almost invariably the case.*

3. *Infants die of erysipelas shortly after or before their mothers die of puerperal fever.*

4. *A few physicians, attending puerperal-fever cases and erysipelas cases at the same time, as exhibited by the "death-register," were the most unfortunate in their practice.*

5. *Physicians having large obstetrical practices, who are known to be believers in the doctrine enunciated regarding the connection of puerperal fever and erysipelas, make an exhibit of but few death-certificates from either cause.*

6. *For these reasons we are again justified in thinking there is an intimate connection between the two diseases.*

It is easy to foresee the objections that will be made to these propositions. In the first place, it might be said that typhus fever and scarlet fever are often prevalent at the same time puerperal fever is, and that, for this reason, we might say that there is an immediate connection between those former diseases and the latter; indeed, this connection is claimed, and generally admitted by modern authors. The claim of erysipelas and puerperal fever to a very close connection is on stronger grounds than is generally admitted. In the first place, puerperal fever and erysipelas prevail together, beyond the geographical limits of typhus fever, and in localities where the last-named disease is unknown. Again, puerperal fever is most prevalent, in the United States, in that very section of country where there is the least scarlet fever. I allude to the Southern States. Yet, again, typhus fever and scarlet fever often prevail extensively as epidemics, and no special tendency toward puerperal fever is noticeable, while the appearance of an erysipelatous tendency is *invariably* followed by a decided tendency toward puerperal fever, or an epidemic tendency of the latter is a signal for the appearance of the former. Again, the *interchangeable* character of puerperal fever and erysipelas has long been noticed; the erysipelas poison giving rise to puerperal fever, the latter again giving rise to the former. It is questionable whether puerperal fever ever gave rise to typhus or scarlet fever. I am not claiming, be it understood, that there is no connection between typhus fever, scarlet fever, and puerperal fever. I am only urging what

seems to me to be the superior claims of erysipelas to an intimate connection with epidemic puerperal fever.

I am a firm believer in the doctrine so strongly urged by Dr. Tilbury Fox, of London, that erysipelas and puerperal fever are entirely dependent on a common poison. Says Fox:\* "The existence of a special and peculiar disease (puerperal fever), one *sui generis*, is certainly contradicted by the mass of cases which the records of the General Lying-in Hospital furnishes, for the disease is explicable by the action of an already well-known poison.

"That puerperal fever and erysipelas are rife at the same time is well known; and that during epidemics of the former, the most malignant cases of the latter occur, is undisputed.

"At the General Lying-in Hospital, 1838 the year of greatest mortality, and in this year the death-rate of erysipelas was at its highest.

"During 1854-55, a larger number of deaths took place than in any of the few previous years; and 1855 was remarkable for an excess of deaths from erysipelas. There are causes in action peculiarly predisposing to erysipelas and puerperal fever alike.

" *Predisposing Causes.*—A. *General.*

"1. Such as concentrate: Hospitals and their overcrowding.

"2. Such as interfere with the patient's health: Bad ventilation, bad food, deprivation, hemorrhage, and absorption of clots set, mental.

" B. *Local.*

"1. Presence of irritation: Clots in uterus.

"2. Presence of wounds: Perineal, placental, changes going on in uterus and peritoneum, absorptive act accelerated.

"*The efficient Cause.*—The virus, the special attribute being malignancy. In the case of puerperal fever this attribute is deemed sufficient to guarantee the existence of a disease, *sui generis*.

"Points in which puerperal fever establishes its identity with erysipelas:

"1. They are mutually reproducible. Mr. Bird, in his pamphlet on erysipelas, gives sixteen authorities on this point. Dr. Lee, perhaps, gives the most forcible examples.

"2. The character of the onset is that of erysipelas.

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\* Dr. William Tilbury Fox, in Transactions of the Obstetrical Society of London, Vol. III., 1861, p. 368 et seq.

- "3. Prodromata slight.
- "4. Time of attack frequently at night.
- "5. Occurs under same circumstances and at same seasons.
- "6. Progress to acute pus formation.
- "7. Character of lesions: Acute, diffuse, multiform abscesses.
- "8. If eruption exists, it is that of erysipelas.
- "9. State of local wounds, etc., painful, hot, tumefied, smarting.
- "10. Presence of lymphatic inflammation, bullæ, sloughing, erratic lesions.
- "11. Convalescence about ninth day or so.
- "12. Time of death before tenth day; half between fifth and ninth in erysipelas. No one who has watched an epidemic of erysipelas, running on to hospital gangrene, and the post-mortem, after a case of lithotomy, for instance, at such a time exhibiting peritonitic and pyæmic lesions, can fail to see the true analogy of puerperal fever and erysipelas; and accoucheurs can not but accept evidence obtained beyond the limits of the lying-in hospital toward the complete solution of the mysteries of puerperal fever."

No better arguments can be adduced, showing the connection between puerperal fever and erysipelas, than those used by this most distinguished English writer.

The decided tendency of the day is to attribute all cases of puerperal fever to a common poison, from which may be also developed typhus fever, scarlet fever, and other so-called zymotic affections. This is very pretty theoretically, and a most reasonable doctrine to accept; but in accepting it, we acknowledge our inability to say what the poison is. The subject of the connection of septicæmia and puerperal fever has been most ably discussed of late, and many interesting experiments have been made in the attempt to prove the community of origin of the two diseases. Among the special papers published on this subject latterly, is that of Dr. A. D'Espine.\* Says our author, in the introduction of his article (p. 167): "Since anatomo-pathological investigations have progressed on an equality with a more rigorous and more impartial clinical observation, we have been obliged to recognize the fact that *puerperality* is not governed by influences or special laws;

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\* Contribution à l'Étude de la Septicémie Puerpérale. Par A. D'Espine, Interne des Hôpitaux. Archives Generales de Médecine, February, May, August, and October numbers, 1872, Vol. I., pp. 167, 531; Vol. II., pp. 191, 415.

and that, if the particular anatomical conditions to uterine traumatism, and the modifications impressed on the organism by gestation, may give a particular type to pathological processes, nevertheless there is no difference of substance, of nature, between puerperal fevers and surgical fevers; they are sisters. The discoveries made in one of these domains applies at the same time to the other, so that if we could succeed in determining the question of purulent intoxication, of erysipelas, of hospital gangrene—in a word, of all the poisonous influences to which the wounded are exposed—we might determine, at the same time, the problems that the study of puerperal fever raises.”

D'Espine claims that puerperal fever is nothing more nor less than septicæmia. The question of the entire identity of septicæmia and puerperal fever is still to be doubted. D'Espine, in speaking of what this poison may be, says (p. 453): “But are there different septic poisons; or, in other terms, the nature of the poison, can it vary? This question, which assumes an attitude likewise for surgical septicæmia, is difficult to determine, because we know very incompletely the chemical and biological qualities of septic materials. Thus, in special pathology, we distinguish *erysipelas*, *hospital gangrene*, *septicæmia*, and *pyæmia*, which all enter into the class of traumatic toxæmia; but, in general pathology, we see that the effects upon the organism of septic poison can be distinguished. This fact appears especially in the history of puerperal septicæmia.”

An epitome of the opinions of many writers on this subject for ages past, together with valuable biographical references, may be found in the well-written paper of Dr. A. Lacassagne,\* under the heading of “La Putridité en Obstétrique.” The reader so inclined may find much that is valuable in the opinions enunciated by various authors regarding puerperal fever, and especially its seeming connection with septicæmia.

One of the most excellent and readable books ever written in the English language, on the special subject of puerperal diseases, is, I think, that of our own distinguished countryman, Prof. Fordyce Barker. In his work, just published,† I notice that Prof. Barker discusses all the theories regarding puerperal fever in his

\*De la Putridité Morbide et de la Septicémie, Histoire des Théories Anciennes et Modernes. Par le Dr. A. Lacassagne, Paris, 1872, p. 84 et seq.

†The Puerperal Diseases. Clinical Lectures delivered at Bellevue Hospital. By Fordyce Barker, M. D., New York, 1874.

usual clear style, and among others that especially claimed by D'Espine. Says Dr. Barker: "The septicæmia theory is incompatible with the authentic facts which demonstrate that puerperal fever is contagious and infectious. Those who believe that puerperal fever is identical with septicæmia deny that the disease is really contagious, although they admit that it is 'manually transferable'" (p. 464). Again: "Puerperal fever differs from septicæmia in its origin, its modes of attack, and its symptoms. The former disease originates from epidemic causes, and from contagion and infection; the latter, from nosocomial malaria, from autogenetic infection, and from direct inoculation. The symptoms of the former are frequently manifested a day or two before, or during labor, even when the child is subsequently born alive. This fact has been noted by many observers, and I suppose it must have been remarked by every one who has seen epidemics of this disease; but, in septicæmia, the symptoms are never observed before, or during labor, except when the fetus is putrid, as a traumatic lesion is a necessary element for the absorption of the septic material" (p. 467). Again: "That puerperal fever is not identical with septicæmia is demonstrated, also, by the difference in the influence of the two diseases on the infants of the mothers affected. There are two diseases which are extremely liable to occur in the infants of mothers suffering from puerperal fever. Erysipelas is the most frequent, and proves fatal in a large majority of cases. In this hospital (Bellevue) it has been very common in several of the epidemics of puerperal fever. That the erysipelas is not developed exclusively by the vitiated air of hospitals, but is directly the result of the maternal disease, is evident from the fact that it occurs with great frequency in private practice, in the infants of mothers suffering from puerperal fever, who are surrounded by the most favorable hygienic conditions possible in a city. I have seen this in repeated instances, both in the country and in this city, and in families of wealth, where the greatest care was taken to prevent disease, by the removal and destruction of all sources of infection" etc.

The other disease, so frequently noticeable during periods of puerperal-fever epidemics, according to our distinguished author, is trismus nascentium.

The objections here urged by Dr. Barker are, I think, unanswerable. In an appendix to his book, Dr. Barker remarks: "During the early months of the present year (1873), puerperal fever prevailed in the best parts of the city, and in that class of society pos-

essed of abundant means, and living under as good sanitary conditions as are possible in any large city, to a degree and extent here unknown for the past twenty-five years." Still further on (p. 516), our author continues: "Erysipelas was not epidemic in that part of the city where puerperal fever was rife, nor, indeed, in any part of the city, although there were a few sporadic cases," etc.

This epidemic tendency, of which Dr. Barker speaks, commenced in 1872. If we are to believe the statements made in the "New York Health Report" for that year,\* for we find (p. 94), in a summary of the mortality occurring in the quarter ending March 30, 1872, the following remark: "Puerperal diseases produced 136 deaths; their average for the previous five years having been but 71." Or yet, again, in the same health report (p. 100), speaking of the mortality of the spring quarter, the health officer remarks: "*Erysipelas* and *puerperal fever* prevailed extensively."

From this health report we compile the following table, showing that the increase in the puerperal-fever mortality was coincident with that of the erysipelas mortality:

	ERYSIPELAS.		PUERP. DISEASES.	
	1871.	1872.	1871.	1872.
Winter quarter, ending March 30, 1872.....	54	64	103	136
Spring " " June 29, 1872. ....	50	73	90	131
Summer " " Sept. 28, 1872.....	18	23	67	83
Autumnal " " Dec. 31, 1872.....	23	25	102	104

A close study of this table will enable any one to see that the increase of the two diseases is correspondent from 1871 to 1873. The epidemic of puerperal fever spoken of by Dr. Barker, really commenced in 1872 with the appearance of an increased erysipelas tendency. So much again for the connection of the two diseases.

Of the deaths classified under the heading "puerperal diseases," we see that 178 of the deaths were from "puerperal metritis" and 109 from puerperal fever. Sixty-nine of the decedents were native-born white women, while 212 were foreigners, and 6 were colored women. The balance of the decedents from puerperal diseases came under different headings. The large mortality among foreigners is noticeable in this connection.

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\*Third Annual Report of the Board of Health, New York, April 11, 1872, to April 30, 1873. New York, 1873.

Dr. Braxton Hicks,\* who is inclined to believe that an intimate connection exists between scarlet fever and erysipelas, and in this way traces many cases of puerperal fever to the influence of the scarlatinous poison, could not find much analogy if he were to search the "Health Office" records of this city (Cincinnati) for a corroboration of such an opinion.

An epidemic of scarlet fever is at this date (June, 1874), prevailing in this city, although now happily on the decline. This epidemic commenced in May, 1873, *after the subsidence* of the puerperal-fever epidemic. To quote from the "Health Report" (p. 33): "No month was exempt from *scarlet fever*, although there were only 15 deaths from the disease during the first four months of the year. Only one of these occurred in April. After that, the deaths from scarlet fever increased each month, until there were from it 113 deaths in November; 108 died of the same disease in December. The total deaths for the year, from this cause, were 410." Now, according to Dr. Hicks' theory, we should see puerperal fever make its appearance. Mark the sequel. In 1874, up to this date (June 1st), puerperal fever has not been prevalent—less than the usual number that occur in healthy years; the same can be said of erysipelas.

The victims of scarlet fever up to date, from the commencement of the epidemic, number about 800. Now, according to the reports filed at the "Health Office," by the "outdoor-poor physicians," the mortality rate has only been about one patient out of ten. From this, it will be seen that the number of scarlet-fever cases must have been several thousands.

Now, let us look for the erysipelas and puerperal-fever cases that occurred this year. We find from the registry of the "Health Office," that during the last five months, 14 deaths from puerperal fever and puerperal peritonitis have occurred, and 9 from erysipelas. After a careful examination of the "Health Office" records, no connection seems to exist between these cases of puerperal fever and erysipelas and the cases of scarlet fever, save in one instance. On the 19th of January, 1874, a woman, aged 26, died on Hopkins street, of puerperal fever. On the following day, *in the same house*, a death of a child, of the same name as the decedent from puer-

\* "There is no doubt but that scarlet fever and erysipelas have much affinity; indeed, some have suspected them to be but a slight modification of the same poison, apparently interchangeable." Braxton Hicks, in *Transactions of the Obstetrical Society of London*, Vol. XII., 1870.

peral fever, of scarlet fever. These cases were attended by different physicians. No more deaths from erysipelas or puerperal fever occurred in the same house where any case of scarlet fever had died. Mr. Chapman, clerk of the Board of Health, went through the registry and worked up this point.

Now, I do not say that there is no connection between puerperal fever and scarlet fever; but, if there be an interchangeable tendency of these diseases, such tendency was not manifest during this present scarlet-fever epidemic. A careful review of the figures of the census of 1870 does not justify such a claim; for, as we have before mentioned, scarlet fever prevailed to no extent in the Southern States, where the puerperal fever is most prevalent, in proportion to population. The census mortality tables of 1860 also confirm this point.

When, in answer to the query, "Does puerperal fever appear to have prevailed more extensively when any general epidemic tendency has prevailed in Dublin?" Dr. Evory Kennedy,\* the distinguished Irish obstetrician, replied: "Yes, I have remarked that when continued fever, typhus, or erysipelas were prevalent in the medical and surgical hospitals, puerperal fever appeared to prevail in the lying-in hospital as well as in the city generally. The character of the fever varied also at different times, and occasionally appeared to be influenced in its nature by any prevalent epidemic." Dr. Kennedy continues: "So frequently has metria shown itself afterward, that it is now no longer esteemed an accidental *post hoc*; but they stand in relation of cause and effect. This fact alone goes a considerable way in confirming the idea of a common poisonous principle or miasm."

In a communication to Dr. Kennedy (p. 124 et seq.), Dr. T. W. Grimshaw, of Dublin, after a careful examination of the "Lying-in Hospital Reports," and the Irish census tables, together with the "Reports of the Cork-street Fever Hospital," dating back for many years, makes the following report in regard to the "Co-existence of Metria and other Zymotic Diseases: "

"*Typhus*.—I find that this is the only disease which bears anything like a constant relation to puerperal fever. Thus, of 24 well-marked typhus years, 17 were noted for high mortality in the

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\*Hospitalism and Zymotic Diseases, as more especially illustrated by Puerperal Fever or Metria. By Evory Kennedy, M. D. London, 1869, p. 9 et seq.

lying-in hospital. The most remarkable of these were 1758, 1761, 1800, 1801, 1813, 1824 (a year of great mortality from typhus, when but slight puerperal fever prevailed), 1826, in which the greatest typhus epidemic on record prevailed, and was accompanied by the greatest puerperal epidemic known in the hospital up to that time. The hospital mortality in that year was 1 in 30, or 33.3 per 1,000 deliveries—a rate of mortality which has been exceeded but seven times since. In 1845, a similar correspondence is found. In 1847, another great rise in the death-rate accompanied the famine fever of that year. Exceptions are found on several occasions, the most remarkable of which are the years 1821, 1822, 1824, 1837.

“*Erysipelas*.—The records of this disease are too meagre to enable us to draw any positive conclusions; but its connection, of late years, with metria is too well known to require proof.

“*Scarlatina*.—I have been able to have twelve distinctly recorded scarlatina years. Of these, I find six associated with increased metria: namely, 1763, 1800, 1819, 1843, 1845, and 1866. In the years 1800 and 1845, typhus was also present; and in the year 1843, the rise in puerperal mortality was slight. Six scarlatina years were unaccompanied by any rise in the metria death-rate; indeed, in the years 1798, 1831, and 1833, the death-rate curve is below the fair-rate line.”

The evident leaning of Mr. Grimshaw toward the special typhus-fever poison, as being the one on which puerperal fever is dependent, is noticeable. *Ad interim*, the omission of erysipelas statistics is unfortunate. If we take into consideration the fact that typhus may be said to be endemic in London and Dublin, and in fact throughout Great Britain, it is not surprising that it bears “a constant relation to puerperal fever.”

Said the late Dr. Bartlett,\* speaking of typhus fever: “Like small-pox, and like scarlet fever, it is always present in Ireland; but, at considerable intervals, we find it increasing immensely in the extent of its prevalence, and after the lapse, usually, of from one to two or three years, again subsiding to its permanent and average standard.” Again, we notice, from Bartlett’s account of various Irish epidemics of typhus, that the Foundling Asylum at Cork suffered little or none from the typhus in the epidemic of 1817–18–19. Dr. Bartlett says (p. 229): “The fixed and con-

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\* *Fevers of the United States*. By Elisha Bartlett, M. D. Philadelphia, 1856, p. 237.

stant residence of typhus fever is to be found in the British Isles. The mud cabins of Ireland, and the damp, dark cellars of the cities of Great Britain, are its true *habitat*. These are its perpetual lurking-places, and here it is always to be found. The terms 'Irish typhus' and 'British typhus' have indeed come to be its most distinctive appellations."

It is not our intention to here discuss the connection said to exist between typhus fever and puerperal fever. The census tables of 1870 only show a mortality from typhus of 1,770 persons; and I doubt exceedingly whether one-half of these cases were genuine cases of typhus, as typhoid fever is so frequently called typhus, especially by our German physicians (*typhus abdominalis*), hence a confusion in nomenclature. A careful study of these same census tables does not appear to show any connection between the typhus fever, septicæmia, pyæmia, and other affections with puerperal fever. Now, not denying that this connection may exist, the following propositions may stand or fall, as the proof requires:

1. Epidemic typhus is not always associated with an outbreak of epidemic puerperal fever.

2. Epidemic scarlatina is very seldom associated with an outbreak of epidemic puerperal fever.

3. Epidemic erysipelas is *invariably* associated with an outbreak of epidemic puerperal fever, or *vice versa*.

Now, if these propositions will stand, the relation of erysipelas to puerperal fever can be said to be more constant than either scarlet fever or typhus.

Cincinnati has had epidemics of small-pox and scarlet fever, without the appearance of epidemic puerperal fever, and Cincinnati is outside the typhus-fever limits. The State of Ohio has had epidemics of erysipelas, and with these epidemics the outbreak of puerperal fever was noticed.

Let us, finally, once more turn to the subject of contagion ere we close:

In that most able and excellent article, written by L. Gosselin and Maurice Raynaud,\* the former remarks (p. 13 et seq.): "There is a last reason, which, to my mind, always demonstrates the infectious character of the disease (erysipelas), and explains the predilection of the epidemic form for hospitals: it is, that ery-

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\* Erysipéle Médical. Nouveau Dictionnaire de Médecine et de Chirurgie, Vol. XIV., Paris, 1871.

sipelas often breaks out at the same time as puerperal fever. This coincidence, described by Graves (of Dublin), admitted by Trouseau, has been demonstrated by an *ancien interne* of the Hôpital Saint-Louis, Dr. Pileau Dufeillay. It is true, we might explain it by the atmospherical constitution, and say that the two diseases are due to a special and unknown meteorological condition, without having any influence upon each other. If this explanation was true, "we should not see epidemics limit themselves at one time to one hospital, at other times to another. The pretended medical constitution does not appear to me likely to limit itself in this fashion. I understand much better when a certain number of puerperal-fever cases (this disease is likewise infectious and contagious), being developed in a hospital ward, the miasma emanating from them infects the ward and the adjoining wards, and that among the wounded attacked by these miasms, the poisoning presents the form of erysipelas. I understand, in the same way, that erysipelas existing in a large number of patients, would give rise to puerperal fever. There would be thus a certain analogy of origin between the two diseases."

Says Jaccoud: \* "The contagion or poison which engenders erysipelas is totally unknown; the mode and conditions of its transmission is likewise unknown; but the existence, at the same time, of the poison and its diffusibility, is demonstrated by the epidemic form of this exanthemata," etc.

In a very late article on erysipelas, by Dr. Lordereau, † the following significant passage occurs: "We shall not cite as an example the suppurative *peritonitis* which very often accompanies the umbilical erysipelas of new-born infants. This lesion appears to us to result much less from erysipelas than from umbilical phlebitis, and, above all, from that general condition which has been called puerperal, and which produces sometimes peritonitis as well as erysipelas, having a seat far from the abdomen," etc. Says Kennedy (Ib. 34): "The proposition, that metria is contagious, is one that I am just as well satisfied of, as that typhus or erysipelas is contagious," etc. Again: "The occurrence of sporadic cases of this disease, leaving no possible trace by which they can have spread by contagion from another parturient female, has, no doubt,

\* *Traité de Pathologie Interne*. Par S. Jaccoud. Paris, 1871, Tome II., p. 716.

† *Production de Pus dans l'Erysipéle*. Par Dr. Lordereau. *Archives Generales de Médecine*, Mars, 1874, p. 288.

given rise to, and confirmed the idea of, its non-contagious nature; but exactly the same thing may be said of typhus fever and erysipelas. They occur no doubt sporadically, but will any one deny their spreading by contagion? I doubt not, however, that many of those cases, which we called sporadic cases of puerperal fever, were cases of traceable contagion, in which the contagion was carried from another case similarly affected, by the medical attendant or nurse-tender."

Need we go on to multiply our authorities on this subject of contagion? I think not. If the reader desires to investigate the special subject of the connection of the two diseases further, a careful reference to the numerous writers I have quoted will, I think, satisfy the most incredulous that there is a connection, and that they are mutually interchangeable. That many cases reported to be puerperal fever are cases of puerperal septicæmia, I have no doubt, and that these latter cases, while infectious to the highest degree, and capable of being manually transferable, can not be said to be genuine cases of puerperal fever as that disease is observed in its epidemic form, I fully believe; as I likewise believe, that erysipelas and puerperal fever are entirely dependent on the same poison—a belief I have frequently reiterated during the course of this article.

Drs. Edward Rives and N. P. Dandridge, pathologists to the Cincinnati Hospital, inform me that the characteristic lesion in the puerperal-fever cases examined by them, during the time of the epidemic, was *peritonitis*. Histories of some of the typical cases of fever occurring in that hospital have been ably reported by Dr. W. R. Amick,\* an *interne* in the institution.

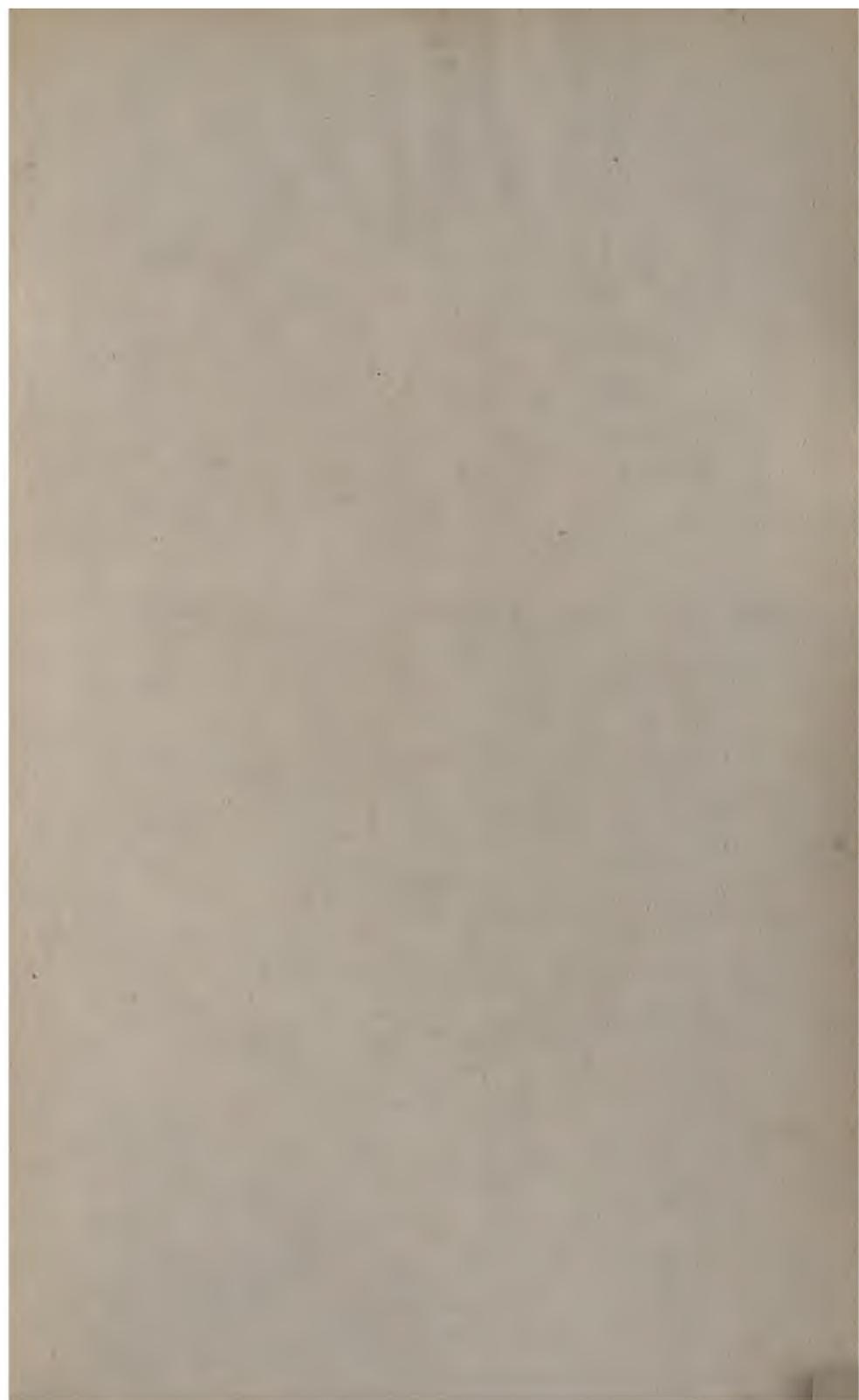
But our task is finished; and incomplete as this paper is, it is to be hoped that from among the mass of chaff a few grains of wheat may be garnered by the future writer on this subject. If such be not the case, I have at least the satisfaction of knowing that many pleasant hours have been whiled away in this attempt to throw light on a somewhat obscure point; *i. e.*, the connection of erysipelas and puerperal fever. "*Vade liber!*"

"Should learned leech with solemn air unfold  
Thy leaves, beware!"

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\* Cincinnati Medical News, April and May numbers, 1874.









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