

ARTICLE II.

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TOPOGRAPHICAL DISTRIBUTION  
AND  
LOCAL ORIGIN  
OF  
CONSUMPTION IN MASSACHUSETTS.

BY HENRY I. BOWDITCH, M.D.  
OF BOSTON.

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READ AT THE ANNUAL MEETING, MAY 23, 1862.\*

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MR. PRESIDENT AND GENTLEMEN :

AT this dark, but, as I deem it, most glorious epoch in the history of the Republic, and while hosts of armed patriots from all the loyal States are gradually and firmly encircling, as with a wall of fire, the traitors to our country's peace, we—as one small corps of that grand army, whose

“duty is to save”—

have again met, on this our annual festival, for fraternal interchange of thought on topics connected

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\* At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

*Resolved*, “That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Addresses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar addresses.”

*Resolved*, “That the Committee on Publication be directed to print a statement to that effect at the commencement of each Annual Address which may hereafter be published.”

with the science or art of our noble, but peaceful profession. The heart of the Nation is in mourning for her soldiers slain in the beauty of their young lives and of their heroic deeds, on the battle-fields of our common country. We, too, lament the loss of many of our well-known and respected fellow soldiers in the battle of life, who, since our last gathering, have left our ranks only to join the mightier hosts of the dead. A few moments spent in commemoration of their virtues will tend to hallow this hour, which, year after year, we devote to professional discourse.

Not less than twenty-seven of our number have died during the past year ; a larger number than has ever been known before within the same period of time. Most of them filled, to the entire satisfaction of the various communities in which they lived, the sacred office of Family Physician. They need no higher or sweeter eulogium ; for that office, worthily filled, carries within itself as rare a combination of virtues possessed and of duties done as usually falls to the lot of man.

I shall not, I hope, be deemed unjust to the memory of others, or as using the language of unmeaning panegyric, if I allude more distinctly and personally to two of them ; one of whom was but recently our President, while the place of the other as Secretary has become vacant only within the last few weeks. . As officers of this Association, therefore, if for no other reason, we owe to their memories, at the present hour, our tribute of respect.

Dr. LUTHER V. BELL\* was a member of a family in New Hampshire, illustrious for its talents and for the high positions held by it in the service of the State. After a brief career as a practitioner of medicine in his native State, he was called, as almost the immediate successor of the late excellent Dr. Wyman, to the charge of the Asylum for the Insane at Somerville. During the twenty years that Dr. Bell was there, the institution sustained its previously high repute. His serene deportment, his pure life, his sagacity, his unswerving integrity, and his many professional accomplishments, commanded the respect of all connected with the Asylum and of the community at large. His Annual Reports were eagerly sought after, and were remarkable for their clear good sense. Although one or more times, in consequence of ill-health, he resigned, he was persuaded to remain at his post for a certain time longer. It was hard to fill his place. After he left the Asylum, in 1856, he spent his hours in dignified retirement in the bosom of his family, only occasionally emerging therefrom to mingle as leader in political life, or to attend in consultation on cases related to his own specialty. In the Courts of Law of Massachusetts, his opinion on medico-legal questions of insanity was highly prized.

While thus resting from his labors, came "this glorious uprising of a great people," and the North as one man sprung to arms, at the fall of Sumter. Dr. Bell felt that the hour had come for every man

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\* Appendix A—Memorial.

to do his whole duty. He applied for and immediately received the appointment of Surgeon to the 11th Regiment, Massachusetts Volunteers. Contrary to the wishes of many, and the advice of others, who thought his health too feeble to endure the fatigues of camp life, he promptly obeyed the orders that summoned him to the banks of the Potomac. His talents and worth soon raised him to the rank of Brigade Surgeon. Soon after he left, a letter was sent to him by a friend, expressive of high admiration of the step Dr. Bell had taken, and wishing him a friendly "God speed." Two manly responses were subsequently received from him, from which I have been allowed to quote certain passages, showing some of his views of the present crisis and his self-sacrificing patriotism.

Under date of Sept. 13th, 1861, after alluding to the opposition of friends to his assuming, in his feeble health, the rough duties of the camp, and of the suggestion of others that when his "enthusiasm had collapsed" he "would pine for the quiet of his amply-provided home," he remarks, "I never for a moment gave heed to those who prophesied a disposition to draw back. Because, never experiencing any other enthusiasm beyond a strong impulse of duty, I knew their premises were ill-founded."

Again, after stating the numerous difficulties he had had to contend with, "yet," adds he, "with all these drawbacks I have never had a sick day, or a sad hour, independently of what a father must feel at the thought of four motherless children away from him; nor has the thought ever crossed my

mind of leaving the service until the last blow is struck upon the life of this atrocious rebellion."

On another occasion, alluding to the objections — risk to life, family ties, &c. — urged by some against the entrance of a young man into the army at the present time, he says, "At all events, we have only one life. What better use of it than to give it to the holy cause of our country? Had my eldest son, who died during his first year of college life, been spared, I would cheerfully have consented to his bearing arms in this hour of emergency."

How fitting it seems that such words of loftiest patriotism should have been sealed only a few months afterwards by his own death, while in the service of his then humiliated country, but now on the very verge of triumph!

Dr. Bell was seized with an acute thoracic attack, following what was supposed to be rheumatism. His dyspnœa was intense for a short time; but, as we learn from his attendants, his confidence never forsook him. He knew that his last illness was reached. Though his sufferings at times were great, he conversed freely with the Chaplain upon high religious topics; and, commending himself to God, quietly expired under the ample folds of his dear country's flag. I quote only the language of one who knew whereof he spoke, when I add that, in the death of our beloved friend and learned associate, the officers of the staff, from the highest to the lowest, felt that their "light" had been extinguished. Stronger, more intellectual, perhaps physically braver men there might be; and the loss of each

other one could be readily supplied by an associate equally worthy. But into the magic circle of good and winning qualities possessed by Dr. Bell, and which made him thus the electric light of the staff, none else could enter. Let us all thank God for this bright, this beautiful Ideal, which death has now made of our associate's noble life—sanctified, too, as it was, by a patriot's death.

Our excellent friend and valued Secretary, Dr. J. B. ALLEY,\* passed years of the most patient suffering from hereditary phthisis, to the progress of which he ever looked forward, with the most open-eyed cheerfulness, in certain anticipation of his future fate. Unremitting in his quiet but efficient, pious, toil for the good of others, eminently faithful and reliable in the performance of every duty, he was a truly Christian Gentleman, in the broadest signification of that term. I could not find it in my heart to say less of him. I need say no more.

In taking, Gentlemen, a subject for my address on this occasion, I shall follow out the idea quaintly suggested by that admirable man and sweet English writer, George Herbert, when describing what the country parson's sermon should be. "The world," he remarks, "is full of these composures, yet every man's own is fittest, readiest and most savory to him." Some of you have already listened to my previous, imperfect discussions on the topic I shall present, for I have twice before at our annual meetings, at

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\* Appendix—Memorial.

Springfield in 1855, and again at Boston in 1856, made brief allusions to an investigation I was at that time carrying on, as a Committee of this Society — namely :

ON THE TOPOGRAPHICAL DISTRIBUTION AND LOCAL ORIGIN OF CONSUMPTION IN MASSACHUSETTS.

Since that time, my attention has been constantly directed to this important subject. My convictions have become more and more settled upon the essential truthfulness of the views I, in 1855 and '56, only tremblingly enunciated. I have obtained since then, through private investigations and from various correspondents, not only in Massachusetts, but in New England, still more ample proof. My own daily practice in connection with this terrible scourge, said by Keith Johnston\* to be endemic, par excellence, in New England, is perpetually modified by my stern belief in principles then stated imperfectly. I should therefore consider myself really culpable were I to waste your valuable time in any abstruse and polemical questions on therapeutics, or the general practice of medicine, and should neglect to speak on that subject, which, for eight years past, has engrossed so much of my thoughts.

The facts I shall lay before you, and the principles I believe fairly deducible therefrom, involve the

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\* Geographical Distribution of Health and Disease, by W. Keith Johnston. Edinburgh, 1854.

Dr. Josiah Curtis (Mass. State Registration, 1859, page 71) virtually agrees to this when he says that three die of consumption in New England for every two persons in Great Britain of the same disease.

question of the proof or otherwise of the existence of a Great Primal Law in the Development of Consumption in Massachusetts, and probably New England, and possibly of a still wider scope, *not hitherto distinctly recognized*. Attention to this law by our ancestors, and by ourselves at the present hour, would, as I believe, have saved, and would still be saving, hecatombs of human beings that are now annually sacrificed. Holding most firmly to this opinion, you will readily understand my eager anxiety to convince not only you, my associates and efficient collaborators in this investigation, but, through you, the whole community, of its vital importance to the present and still more to future generations in New England, and possibly other parts of our country.

But in addition to the intrinsic worth of the subject to be discussed, I claim your candid, and, if possible, close attention to the remarks I shall make, for another reason, viz.: The inferences I shall make, and the Law of Consumption Development I shall try to support, are merely the summing up of data furnished to me by yourselves. I stand, therefore, now before you the exponent of your own (unconscious, perhaps, it may be on the part of many of you) medical opinion. For you are all aware that to the courtesy and to that fine *esprit de corps* I have always found in the Massachusetts Medical Society, spread as it is over all the Old Bay State, from beyond the Berkshire Hills to the Atlantic Coast, I owe *all* the chief facts and statements upon which this opinion is founded.



The two following propositions contain the essential points of this address :—

*First.* A residence on or near a damp soil, whether that dampness be inherent in the soil itself, or caused by percolation from adjacent ponds, rivers, meadows, marshes or springy soils, is one of the primal causes of consumption in Massachusetts, probably in New England, and possibly in other portions of the globe.

*Second.* Consumption can be checked in its career, and possibly, nay probably, prevented in some instances, by attention to this law.

The essential truths thus enunciated I am ready to defend against all mere assertions of individual opinion, however much those assertions may appear to sustain the reverse of these propositions. I pray you not to judge hastily, but if any remarks I make seem not warranted by the present state of medical knowledge, suspend awhile your judgments, and look not only at *my* facts, but open your own eyes and your intellects to a fair and thorough examination of similar facts, that may be really occurring within the rounds of *your* daily professional life. If you do this, it may happen, as it has happened to myself, and also to one who was, at first, a very decided opponent, an aged and very excellent practitioner in New Hampshire. We both became convinced, in spite of our own preconceived notions, solely by the evidence of actual phenomena, occurring, as it were, under our very eyes.

I lay down now before you, as among my *Medical Axioms*, the following statements:—

1st. *Consumption is not, as some writers have contended, endemic equally in every part of New England*; but there are some localities where it is very rife, and others where it is vastly less destructive than in the State at large.

2d. *There is a law, hitherto scarcely noticed, or but vaguely hinted at by one or two individual writers, but (as I believe) never proved until now, which is one of the main causes, if not the sole cause, of this unequal topographical distribution of consumption in New England.*

3d. *This law is intimately connected with, and apparently dependent on, the humidity of the soils, on or near which stand the towns, villages, or even single houses, where consumption prevails.*

4th. *The existence of this law of soil-moisture, as one of the prime causes of consumption in New England, can be proved, as I think, by several lines of argument, resting on actual facts obtained either from public or private records, statistical data, or the opinions of physicians, practising medicine in various parts of New England.*

These lines of proof, or of argument, are drawn from the following sources:—

I. Massachusetts State Registration Reports.

II. Medical Opinion of Massachusetts, as embodied in the returns made to me, as a Committee of this Society—these returns consisting of written

reports from resident physicians of one hundred and eighty-three towns.

III. Actual Statistics of deaths by consumption, received from such correspondents. Some of these statistics are but *incidentally* mentioned, while others are from towns, districted and carefully examined with reference to the relative prevalence of consumption in the different districts. In some of the most important of these, the examination was made without my correspondent or myself being aware of the existence of any law such as that which I shall present at this time.

IV. Peculiarities of certain towns and of villages in the same townships, in some of which consumption is quite prevalent, and in others much less so; these differences being connected most closely with corresponding differences in the amount of moisture of the soil of said places.

V. Certain well-known houses, which, in various towns, are known by the inhabitants and physicians to have been long noted as the abode of consumption, and in some of which several families have been, during the past fifty years, cut off by the disease, without the least suspicion, on the part of the occupants, of the fatal position in which the houses were placed.

VI. Confirmatory facts, statistics and opinions from Rhode Island, Maine and New Hampshire.

VII. The medical statistics given in the Report on the health of the United States Army, strongly supporting the idea of the existence of the same law, and the operation of it over the whole of the United States.

VIII. Results of my own practice since I first became convinced of the truth of the law—said results consisting of (a) Statistics from my private medical records; (b) Results actually derived from my choice of localities for consumptive patients, based on a belief in the law.

IX. Apparent exceptions to the law.

It will, of course, be impossible to do anything more than briefly allude to each of these various lines of proof; and while doing so, I must ask you to believe in the truthfulness of what I quote from the voluminous manuscript reports and letters, received chiefly from yourselves and from some excellent and zealous physicians in Maine, New Hampshire and Rhode Island.

These reports and these letters should be kept among other valuable manuscripts of the Society. They embody not only the present medical opinion about consumption and its causes, in Massachusetts, but much incidental matter of importance to Public Hygiene. I hope, at some future time, the Society will have portions of them published.

#### I. STATE REGISTRATION REPORTS.

The following table is mainly founded on statistics of four years, or between 1849 and 1852, inclusive. The last column, containing the proportion of deaths by consumption to the population, includes five years, viz., 1849-'53 inclusive.\*

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\* State Registration, Report 11th, pages 70-136, and Report 12th, p. 162.

TABLE I.

Showing Consumption slightly more prevalent in the Atlantic than in the Inland Counties.\*

INLAND COUNTIES.	Deaths by Consumption, 1849 to 1862.	Deaths by all Diseases, 1849 to 1862.	Per centages of Deaths by Consumption to all Deaths.		ATLANTIC COUNTIES.	Deaths by Consumption, 1849 to 1862.	Deaths by all Diseases, 1849 to 1862.	Per centages of Deaths by Consumption to all Deaths.	
			One Person dies by Consumption in every †	One Person dies by Consumption in every †				One Person dies by Consumption in every †	One Person dies by Consumption in every †
Berkshire .....	591	2783	21.27	67 per.	Barnstable ...	473	1869	25.30	60 per.
Franklin .....	419	1733	24.17	56 "	Bristol .....	1172	4920	23.82	50 "
Hampden .....	720	3529	20.40	55 "	Dukes .....	214	738	28.99	50 "
Hampshire .....	520	2355	22.08	53 "	Nantucket..				
Middlesex .....	2292	10802	21.21	53 "	Plymouth...	894	3223	27.73	47 "
Norfolk .....	1046	5168	20.22	58 "	Essex .....	2153	9369	22.97	48 "
Worcester .....	2080	9287	22.39	48 "	Suffolk .....	2696	16934	15.91	42 "

\* 22.44 of all deaths in Massachusetts are caused by consumption. Vide Reg. Rep. 1853 ; also 1859, p. 71.  
 † Data for 5 years, 1849 to 1853. (See Appendix.)

Middlesex and Norfolk Counties are placed among the inland counties, while they do, in reality, touch the Atlantic coast. Strictly speaking, Middlesex does not touch the coast, though one small point projects down *near* it. In Norfolk, I have considered that the vast proportion of all the inhabitants of the county are subjected to inland influences. All the table is intended to prove, is, that apparently even the imperfect State Registration indicates that consumption is not equally prevalent in all parts of the Commonwealth ; and second, that probably it prevails a little more on the coast, or where coast influences are exerted on the inhabitants, than it does where the inland influences prevail.

Again, it will be remarked that Berkshire, the most western county, about 200 miles from the Atlantic, hilly, with warm valleys, seems less afflicted than any in the State.

Worcester shows apparently the influence of its large central city—"the heart of the Commonwealth"—in the frequency of consumption.

Similar remarks may be made of Suffolk, of which Boston is almost the sole influencing power. Barnstable, on the contrary, on the coast, and doubly exposed to coast influences, has two advantages over its companions. It is a long, comparatively narrow peninsula, and composed almost entirely of a sandy porous soil. Of the advantage derived from these two circumstances, we shall have hereafter opportunities of being convinced, as we proceed in our investigations.

## II.—MEDICAL OPINION ON THE PREVALENCE OF CONSUMPTION IN MASSACHUSETTS.

This opinion is based upon answers made by resident Physicians of one hundred and eighty-three, out of the three hundred and twenty-five townships in Massachusetts. The answers were replies to the two following questions:—

1st, Is any portion of your town peculiarly liable to the prevalence of consumption?

2d, If so, what, if any, are the peculiarities of the spot?

These questions were introduced into a list I had previously prepared of fifteen other questions—the answers to which would enable a reader to judge of the hygienic condition of the township, or localities in it, and obtain some idea of the social and industrial state of the inhabitants.\*

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\* For questions and names of Correspondents, see App. B.

I had hoped to compare these returns with the State Registration Reports of Deaths and Diseases. This was impossible, owing to the imperfect returns made by State officials. I introduced the two questions, above given, rather unwillingly, because I had no belief that any good would result, feeling confident, as I suppose the majority of you are, that consumption prevails equally over every portion of New England. I yielded, however, to the suggestion, because of the sagacity of him who made it.

By dint of repeated circulars, during a period of nearly three years, I obtained returns from all the towns of the Commonwealth. Of the one hundred and eighty-three physicians, I have no reason to believe that a single one held the opinion that I must enunciate, or fail to express what really their data compel me to say. I mention this, in order that you may understand, still more distinctly, how little I, and I think others who now agree with me, have been guided by preconceived notions on the subject. Still further, two of my correspondents evidently recognized the existence of *some unknown* law of development of consumption. They had, in fact, by their own careful investigations, elaborated the influence of the very law, I shall bring forward, and one wrote to me upon the existence of some unknown law; but he could not generalize enough from the imperfect data of one town, even to get a glimpse of what soon became clear to me, who was able to collate returns from all quarters of the State.

Before giving the *resumé* of these returns, and from which I infer the "*Medical Opinion*" of the State, let

me meet an objection urged, at first, by some of the ablest of the profession, and by others, against the value of "medical opinion." "In these days of skepticism, who believes in anything dependent on mere medical opinion?" Such was really the objection instantly raised by one, who formerly was an able opponent. I recognize and acknowledge, to a certain degree, at least, the justice of the palpable sneer against the slight grounds on which medical opinion is but too often based. But I totally deny its applicability to the present case, and for the following reason. In the answers to the two questions above named, there is not involved the consideration of any abstruse question in medicine, but simply the statement of the existence or non-existence of facts, viz., the more frequent occurrence or non-occurrence of consumption in certain localities, and a specification of the peculiarities, if any, of these localities. For aught I can see, we may believe a physician's report of such facts, as much as we would believe the statement made by any intelligent witness of a certain fact. I not only claim this, but I assert that we ought to take the statements made by physicians, educated men, as those made by a class of persons, far above the average of witnesses on any subject. Now this Medical Opinion, which I shall present to you, is simply my inference from statements made to me by physicians, who have had no concert with one another, and must have been without the least suspicion of what I may have thought, or may have been supposed to wish them to say upon the subject. These facts have occurred in their own



townships, while engaged in their daily routines of medical practice. I have simply laid out before me their returns, and from such data have elaborated the following classification of the towns of the Commonwealth. Logically, I think I can claim any inference, that can be justly drawn therefrom, as the *real* medical opinion of the State, even if each and every one of my correspondents, looking at the subject from his own stand-point, may, at first sight, be disposed to deny that he admits the truth of such inference.

All the answers to the circulars, have come from physicians, except in three instances, where there were no physicians in the towns; and in these cases, intelligent citizens have replied.

Two hundred and twelve have answered more or less elaborately, the two questions above stated, viz., by one hundred and eighty-three were given medical opinions, and, at times, statistics *incidentally*; by ten, valuable statistical data were procured for the special elucidation of the subject; by nineteen, either doubtful or opposing statements to the views, entertained in this address, were given; by twenty-one, miscellaneous statements were made on the hygienic condition of the towns, but not bearing at all upon the topics herein discussed.

Finally, from the remainder, a little more than one third of the towns in the State, I have had simply monosyllabic, negative, answers to the two special questions, and equally monosyllabic, but definite, returns to all other questions. These returns cannot, of course, be used in this discussion, save so far

as this, viz., that a certain number of physicians of the Commonwealth have not observed any peculiarities in the prevalence of consumption, in different portions of their towns. The fact, however, that a phenomenon, not very palpable even to the most acute observer, is not seen by every one, is no proof of the non-existence of that phenomenon, especially when it is in agreement with the elaborate, well-gathered statistical data of a certain number.

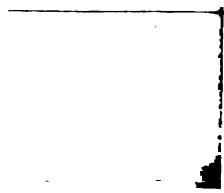
The one hundred and eighty-three townships above-named may be classified as follows:—

<i>First</i> , Townships in which, according to the opinion of resident Physicians, consumption is <i>quite rife</i> . (Colored <i>red</i> on map*)	28
<i>Second</i> , Those in which resident Physicians find <i>certain localities</i> unusually subject to consumption, and more so than are the towns generally. (Colored with <i>red line</i> around township)	54
<i>Third</i> , Those combining both of these qualities, viz., townships in which the disease is <i>quite common</i> in every part, and still more so in certain localities. (Colored with a <i>red cross</i> )	21
<i>Fourth</i> , Those in which it is more rarely seen in the town as a whole, but in which are found certain localities <i>peculiarly afflicted</i> by it. (Colored <i>blue</i> , with <i>red lines</i> around)	23
<i>Fifth</i> , Those in which consumption is rare. (Colored <i>blue</i> )	57
Total,	183

In order to give at a glance the whole results, I submit the following table, compiled from these returns.

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\* See Map.









*Showing the opinions of Resident Physicians in 183 Towns on the Prevalence of Consumption in the Townships or parts of them, and a comparison of this Prevalence with the amount of Moisture and Dryness of the Townships or Localities.*

TABLE II.

No. of Towns from which data are obtained.	Consumption prevails.	Dryness a prominent characteristic (i. e. "towns are exposed," "dry, mountainous," "sheltered," "dry," "island," "peninsula.") <sup>a</sup>	Per cent-ages. DRY or INSURAR.	Moisture a prominent characteristic (i. e. "exposed moist," "on the shore," "near river," "pond," "meadow," "springy soil," "foggy.")	Per cent-ages. Moist.	OTHER INFLUENCES.					
						Bad Habits.	Factory.	Hereditary.	Bleak Exposure.	Valley, Medium.	Doubtful.
28	Generally.	In 6 Towns.	21.42	In 20 Towns.	71.42						2
64	In certain localities	In none.	.....	In 60 localities.	92.69						2
21	Generally and in certain localities.	In 6.	28.67	In 14 Towns.	66.66						1
23	Rarely, but much in certain localities.	In none.	.....	In 16 localities.	76.19						1
67	Rarely.	In 13.	66.52	In 6 Towns.	26.08						2
183		In none.	.....	In 13 localities.	66.62						2
62	Average.	24.48 are dry. 128 are moist.									11

<sup>a</sup> For reasons why "islands and peninsulas" are here included, see remarks in this Address on the subject of "Places of residence favorable for Consumption."

This table may be thus read:—Of those townships where consumption is, in the opinion of resident physicians, *rife*, nearly three quarters (71.42 per ct.) are *damp*; whereas in other townships, where the disease is on the same authority said to be of rare occurrence, *dryness* is the characteristic, in nearly the same proportion (viz., 64.91 per ct.). This becomes still more manifest, if we examine the other data in the table. For example, we find 92.59 per cent. of all those parts of 54 townships which are, for some heretofore, unknown reason, more subject than others to the prevalence of consumption, are moist, and *not one is described as dry!*

Again, of the 21 townships said to have rather more of the disease than other towns have of it, 66.66 per cent. of them are moist. These townships have localities, in which consumption prevails inordinately. Now, in these localities, the per centages in regard to moisture are vastly augmented, 76.19 of them being moist, and *none being described as dry.*

Finally, of 23 townships, in which consumption is thought to be *rarely* prevalent, we find 56.52 per cent. are dry; 26.08 moist; but in these same townships there are localities, peculiarly subject to the disease, and here we find the result similar to that given above, viz., 56.52 of these localities are moist, and *none are dry.*

We thus see, first, that, in the five classes of townships reported upon, dampness of the soil seems to prevail as the prominent characteristic of the *townships*, in which consumption prevails; and second, this becomes much more evident in the smaller lo-



calities and parts of towns where consumption is rife, in *not a single one of which is dryness noticed!* but, on the contrary, very large per centages (92, 76, and 56) are wet. I think you must agree with me that the following proposition seems fairly deducible from the statements given:—

*Medical opinion in Massachusetts, as deduced from the written statements of resident physicians in 183 towns, tends strongly to prove, though perhaps not affording perfect proof of, the existence of a law in the development of consumption in Massachusetts, which law has for its central idea, that dampness of the soil of any township or locality is intimately connected, and probably as cause and effect, with the prevalence of consumption in that township or locality.*

### III.—ACTUAL STATISTICS OF DEATHS BY CONSUMPTION RECEIVED FROM MY CORRESPONDENTS.

This species of proof is, of course, the most valuable, but, at the same time, very difficult to procure. For several years, I have endeavored to persuade some of my correspondents to classify different districts of their several towns, according to the characteristics of the soil or amount of water in these portions, and also to procure the exact number of deaths by consumption and by all diseases, in the same districts, and, if possible, the number of inhabitants of each. To obtain such data, one must have not only very obliging correspondents, but likewise persons of some leisure, and, still more, men imbued with a real

love for scientific investigations into the mysteries of medical topography and vital statistics. A few such it has been my good fortune to have had. And although their statistics are few, they are of such a nature as not only to support the results obtained from medical opinion, but seemed to give more definiteness of outline, to what may perhaps be a law of dampness of the soil, as a cause of consumption, already foreshadowed by medical opinion.

The statistics are of two kinds:—

1st, Those incidentally and cursorily given by correspondents in connection with their general accounts of the hygienic condition of various towns.

2d, Statistics of deaths by consumption and by all diseases, or population, procured from the various districts in the townships. This second series is vastly the more valuable one of the two; and it is evident that any such data, if procured from a perfectly unbiassed source, and if confirmatory of medical opinion and of less elaborate statistics, become of great value, although they may be few in number.

I present the following Table (III.), as showing the first kind of statistics. It may be called the *Table of Incidental Statistics*, to distinguish it from that which I would call *Table of Elaborate Statistics*, to be given subsequently.

We may read this table as follows:—Column first says that in two thirds (8-12) of the twelve towns in which consumption prevails generally, moisture of the places is a prominent feature; while *only one sixth* (2-12) *are dry*. Column second indicates that of nine particular localities where consumption pre-

vails, eight ninths (8-9) are moist or are near moist places, one has a variable state, and *none are dry*.

TABLE III.

*Made by comparing the Statistics of Deaths by Consumption, as given incidentally by my Correspondents in various Towns and localities in Massachusetts, with the hygienic condition (chiefly in regard to the amount of moisture of the soil) of said Townships and Localities, as given by the same Correspondents.*

Characteristics of the Town or Locality.	CONSUMPTION PREVAILS IN TOWN OR LOCALITY						
	Generally.	Locally.	Generally and Locally.		Rarely.	Rarely in Town, but much locally.	
			Gen. 2 towns.	Loc. ....		Gen. 6 towns.	Loc. ....
Dryness.....	2 towns.	....	Gen. 2 towns.	Loc. ....	12 towns.	Gen. 6 towns.	Loc. ....
Moisture .....	8 "	6 towns.	10 "	11 towns	1 "	1 "	4 towns
Moisture near ....	....	2 "	....	....	....	....	1 "
Sheltered, warm ..	....	....	....	....	1 "	....	....
Diluvial, Sand near	....	....	....	....	1 "	....	....
Low .....	....	....	....	....	....	....	1 "
Variable Climate..	....	1 "	2 "	....	1 "	....	....
Promontory .....	....	....	....	....	2 "	....	....
Exp. to N. Winds.	....	....	....	....	....	....	1 "
do. not changeable	....	....	....	....	....	1 "	....
High .....	....	....	....	....	....	1 "	....
Medium .....	....	....	....	....	1 "	....	....
Doubtful .....	2 "	....	....	1 "	....	....	....
Totals.	12	9	14	12	19	9	7

Columns third and fourth show that of fourteen townships where consumption prevails generally, and also locally, in an especial manner, five sevenths (5-7) of the townships are moist, one seventh (1-7) variable, one seventh (1-7) is dry; while of the consumption-bearing localities, eleven twelfths (11-12) are damp, and one twelfth (1-12) is doubtful — *not one is dry*.

Column fifth declares that of nineteen towns, that

have less consumption than others, twelve (12-19) *are dry*, only one (1-19) is moist. The others have influences, either insular, or medium, or tending to dryness. In other words, where consumption is less prevalent, there less moisture is found in townships or localities.

Columns sixth and seventh illustrate in one town the results produced in columns five and two; two thirds of the townships where consumption is rare, being *dry*, while localities in the same townships, known to have an undue amount of consumption, are more than half of them moist, or "near moist," "low," or "exposed" places.

I am permitted therefore, I think, to assert, that:

*Statistics gathered incidentally from my Correspondents sustain, as far as they sustain any opinion, on the question before us, the views we have drawn from Medical Opinion.*

But I shall now present statistical evidence, which not only sustains the results of medical opinion and incidental statistics, but seems to *present strong presumptive evidence* that there is a certain, almost fixed ratio in the prevalence of consumption, according to the amount of dampness in the particular location.

In order to present this part of my subject more clearly, I have prepared the following table from data obtained at my special request. In it are found, I think, accurate mortuary statistics. Though few in number, a careful survey of their bearings upon the question seems to sustain all preceding

statements, and suggests further and more exact ideas of the influence of the law. The following inferences are fairly deducible from the table (IV.):

1st. Six (Acton, Cohasset, Townsend, Granby, Northboro', West Newbury) out of eight towns, carefully districted with reference to locality, afford mortuary statistics each sustaining, more or less fully, all my previous assertions and inferences. One (Boston) affords doubtful results, the statistics of the native population being in accordance with previous results, while the Irish seem to have had a greater proportion of deaths on the hill than in the lower, and apparently, more damp locality. Both of these localities, however, are equal in filth and in all the concomitants of an over-crowded Irish population. Finally, one (Royalston) is reported to have had over five per cent. more of deaths from consumption in the dry than in the wet localities. I do not pretend to account for this, but would simply draw attention to the fact of the enormous per centages of consumption, compared to total deaths in both parts of the town (32.51 and 38.22), indicating certainly a very peculiar township. I know nothing of its peculiarities, and I cannot suggest any explanation of the apparent anomaly. With these exceptions, we may say that from four to fifty per cent. more of consumption deaths are found in the wet than in the dry localities of the townships.

2d. Some of the towns present, in their data, a *more or less regular gradation in the prevalence of consumption, according to the amount of moisture in or near the various localities.*



	Pop. 1868.	One dies by Consumption in every 74.6 persons.	One dies by Consumption in every 29.7 persons.	One dies by Consumption in every 23.69 persons.
NORTHBORO	13 yrs.			
	Pop. 1746. 213 deaths, 43 by Con. fr. May 1, '44 to Ap. 30, '54. 10 yrs.	One dies by Consumption in every 76.55 inhabitants.	One dies by Consumption in every 62.06 inhabitants.	One dies by Consumption in every 24.95 inhabitants.
		<i>Per cent. to estimated Pop.</i>	<i>Per cent. to estimated Pop.</i>	<i>Per cent. to estimated Pop.</i>
TOWNSEND	43 by consumption, fr. 1848 to 1853, inclusive.	16.36	19.11	30.85

\* These statistics were procured from the City Registrar. They are from four districts in the City, viz.: two elevated, Beacon and Fort Hills, and two lower and damper districts, Harrison Avenue and South Cove. Beacon Hill and Harrison Avenue districts are occupied by Americans; the other two by Irish.

† In "dry locality," Royalston, population 350; in "low, damp" locality, 1100.

‡ The returns from West Newbury become more distinct and peculiarly instructive as to the (apparent, at least) influence of moisture, as productive of Consumption, if we classify the districts into northern and southern, or those "adjacent to the river," with "clayey subsoil" drying slowly in the spring, and those separated from the river by a range of hills, and having much less clayey subsoil, being thereby warmer and drier. Thus:—  
In districts No. 1, 2, 3 (Map), northern or river districts, one dies by consumption in every 36.31.  
In districts No. 4, 5, 6 (Map), southern, and drier, warmer, one dies by consumption in every 59.37.

§ These statistics of Townsend show the relative proportion of deaths in the different districts, according to the population in each, as deduced from the absolute number of scholars in each district. To those unacquainted with Massachusetts, and consequently unaware of the almost universal education of children in the country towns of the State, this method of arriving at the relative population may seem very indefinite. I certainly should have preferred more exact returns; but it is evident my correspondent could not, without taking a census of each district, have obtained any returns more accurate than this approximation to the exact truth, obtained from the records of the district schools.

TABLE IV.—(Continued). GRANBY, May 1, 1843, to Dec. 1, 1855.

RETURNS.	Population.	DEATHS.		Per cent. of Deaths by Consumpt'n to total Deaths.	Per cent. of Deaths by Consumpt'n to Pop.
		All Deaths.	Consumption		
<i>Physician's Returns.</i>					
Moist Districts.....	375	....	29	....	7.73
Remainder of Town....	625	....	12	....	1.92
<i>Town Clerk's Returns.</i>					
Moist Districts.....	....	81	36*	44.44	....
Remainder of Town....	....	102	17	16.66	....

\* The discrepancy between the returns of Physician and Town Clerk, is owing to the Clerk having probably recorded some cases as consumption, which merely *appeared* to be such.

In one of them (Townsend), this fact is most extraordinarily well marked. Before receiving these data, I had become convinced that dampness of the soil did have an important influence on the prevalence of consumption, over large tracts of country. But these returns from Townsend indicated that there was, perhaps, a law of consumptive development, that would show itself within much narrower limits. It definitely foreshadowed differences in the deaths by consumption, in spots of the same townships, *very near—almost contiguous to each other*, but which presented very different geological characteristics. Such being the fact, and these data having had such an important influence over my own mind, in its views of this whole subject, I may perhaps be pardoned for alluding still more particularly to them. My correspondent entered, most heartily, into my desire for getting statistics from the different townships and parts of townships. He accordingly obtained lists of all the deaths by consumption, and calculat-



ed the relative population by the number of scholars in thirteen distinctly different districts in Townsend, where he then resided. These data were thrown together in one mass, those of the wet, medium and dry districts being promiscuously mingled. The materials were, in fact, chaotic in their unarranged details. I looked in vain, for some time, for any thread to guide me through the labyrinth of facts. Finally, I threw the letter aside, fearing that though there were facts enough, I should make little of them. As I have hinted above, at the time of receiving them, I had no idea of the existence of any law, in any degree, regulating the production of consumption, within *very limited districts*. With entire scepticism as to the result, I finally, months subsequently to my first reception of them, again took up these data, intending to classify, if possible, the thirteen districts according to the relative amounts of moisture in the soil in each. In order to prevent entirely any bias being given to my mind from vague notions I had already gained of the influence of this law of soil moisture in the State at large, I covered from sight the mortuary statistics, while I was classifying the districts. They could be arranged as follows, viz:—1, dry; 2, “hills, with clayey subsoil, retaining moisture;” 3, “near damp spots;” 4, “in wet and low places.” Now, gentlemen, I can assure you that, when on examination of the record of deaths, I *found such an exact relation to exist* in all the four classes of districts *between the amount of soil-dampness and the number of deaths by consumption*, I was beyond measure surprised. I seemed on the

point of finding out one of the, hitherto unnoticed, laws of development of this dire scourge of our race, and by attention to which, we might hope for some future alleviation of it. For *did not these facts, as far as one imperfect series of facts could do so, seem to indicate that consumption varies immensely with the character of the soil, even within very narrow limits?*

When I revolved in my mind the possibility of this being an exact representation of a great truth, and then thought of the vast influence the thorough knowledge of it must have upon our professional practice, and of the beneficial effects upon Public Hygiene that would perhaps result, *in future*, from an intelligent obedience to it by the community at large, it was the happiest and most satisfactory moment of my professional life. I remembered that over twenty thousand\* consumptive patients had died in Massachusetts during the previous five years. I asked myself these questions:—Supposing this township represents the various townships of the State, and that they all have their varieties of soil, then if this township's statistics are true, and at least twice as many die in the wet as in the dry districts, may not similar results have occurred and perhaps be still occurring all over the State in which these twenty thousand human beings have been slain? Having arrived at this point, you will not be surprised at my asking, still further, this pregnant question:—If our fathers and we had paid greater attention to

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\* In Registration Report, 1857, we find that during the five years, including 1853 to '57, 23,280 died of consumption in Massachusetts.

this law, and we had always resided in dry localities, leaving the lower and moister for the purposes of business, perhaps, during the day, or for agriculture, should we not be saving over one thousand lives annually in Massachusetts, which are now foolishly sacrificed? These questions I then answered but imperfectly, but statistics since received, and of which I shall hereafter give you, I hope, more convincing examples, have only made me, each year, more firm in the conviction of the affirmative of these questions, at least in all their essential elements.

I pass, however, now to my fourth line of evidence.

IV.—PECULIARITIES OF CERTAIN VILLAGES IN CERTAIN TOWNSHIPS, IN ONE OF WHICH CONSUMPTION IS QUITE PREVALENT, AND IN ANOTHER MUCH LESS SO, THESE APPEARANCES BEING CONNECTED MOST CLOSELY WITH CORRESPONDING DIFFERENCES IN THE AMOUNT OF MOISTURE OF THE SOIL AND EXPOSURE OF SAID VILLAGES.

I have only two townships of which the resident physicians have given me statistics, each of two villages within their own immediate circle of practice, and concerning which they are thoroughly acquainted. These townships are Marlboro' and West Boylston.

The former, twenty-five miles west of Boston, is one of the best agricultural towns in the State. Dr. E. T. Barnes thus describes two villages: Both are situated higher than the adjacent towns; both have a strong loamy soil, rocky, full of springs, and both seem equal in this respect. The more westerly one

is one hundred and fifty to two hundred and fifty feet higher than the other. It runs north and south upon a ridge of hills, which ridge is the first obstacle the gusts and blasts from Wachusett and Monadnock Mountains meet with, in their career from north-west to south-east. They rush over this village with the greatest violence and velocity. The east village, running east and west, is sheltered on the west, north and east by considerable hills, and is comparatively exempt from these inconveniences. The snow remains much longer in the former than in the latter. The town contains more than 4200 inhabitants, and Dr. Barnes can remember all who have died of phthisis during the last ten years. He says forty, or perhaps one or two more, are all who have died of consumption in the township, during that period. Of these, eighteen were residents in the more exposed village; three or four resided in the least exposed village. This statement, of course, simply asserts, that of two equally damp villages, that which has the bleaker exposure has suffered more from consumption than the other that is less exposed. It is, therefore, another argument that consumption is not equally prevalent in every part of the State; but proves nothing in regard to dampness alone. While claiming dampness of the soil as *one of the prime causes of consumption in New England*, I do not assert that it is the sole cause, or that the combination of changeableness and coldness with moisture, may not be vastly more fatal than moisture alone.

The statistics of the second town, viz., West Boylston, is definitely in favor of dampness as a cause

of consumption, while at the same time they suggest the importance of defence from the northern and eastern blasts.

Dr. Lovell, the resident physician, gave me such a deeply interesting account of the differences between the two villages, in their relative amount of pulmonary disease, that I was induced to visit them.

I found them as follows: In the village where consumption prevails, the houses are situated nearly on the immediate level of a mill-pond, and at the junction of two rivers. Water seems permeating every where, and not a cellar, as it seemed to me, can escape its influence. To increase the coldness of the spot, the north and north-east winds have full access to it through the river valley. Although the day was fair and not at all cold, I felt chilly as I drove through it. Dr. Lovell assures me that the nights in this village are cool and damp, seldom without a fog. The other village, a mile or more distant, is situated on a ridge of land, fifty or sixty feet above a small artificial pond, surrounded chiefly by a sandy beach. North of the village, but at a certain distance from it, arises a high ridge of sandy hills, covered with woods. The whole position is evidently one entirely different from that of the other village, being essentially dry, warm, open to the genial southern sun, and defended from northern and eastern blasts. Dr. Lovell says: "The air here is generally warm and dry, so that the inhabitants sleep with their windows open from early spring to late in the autumn." Dr. Lovell gave me statistics for 15 years, and the estimated relative

population of the two villages, viz., 500 in the moister and colder, and 200 in the drier and warmer. In the former he had had 12 cases of consumption, in the latter only 1. He had likewise noticed a much greater prevalence of other diseases, connected with the air-passages, as croup and bronchitis, pneumonia, &c. in the damper village. At the time of my visit, I observed with painful anticipations, that low down on the very edge of the pond, at the base of the bluff on which the drier village stands, and over almost the only land, that presented a wet, meadowy aspect, the proprietor of the factory was erecting a new building, for the purpose of using it as a residence for his workmen, nearer to their place of work than the houses, on the ridge above. I even then feared the result, and I beg you to mark the fact that has since occurred, I will not say, in consequence, but certainly in connection with this change of location of the residences of the people, viz.: Dr. Lovell remarked to me within the past year, that, since his first report to me in 1855 and '56, consumption had appeared to be more prevalent in that village.

V. — CERTAIN HOUSES, WHICH, IN VARIOUS TOWNS, HAVE BEEN LONG KNOWN, BY THE INHABITANTS AND BY RESIDENT PHYSICIANS, AS THE ABODES OF CONSUMPTIVE PATIENTS, AND IN SOME OF WHICH, SEVERAL FAMILIES HAVE BEEN, DURING THE PAST FIFTY YEARS, CUT OFF BY CONSUMPTION.

The evidence I shall present upon this point and during the remainder of these remarks, I have

never placed before you at any previous period, they having been all procured since my report in 1856. They are among the most remarkable I have obtained. By them I think I shall lead you very strongly to suspect, even if I do not wholly convince you, that this all-powerful law of soil-moisture exerts its baleful influences within still narrower compass, than any previously hinted at, and that *even some houses may become the foci of consumption, when others but slightly removed from them, but on a drier soil, almost wholly escape.*

I am myself acquainted with two houses within twelve miles of Boston, in which I have no doubt this influence is working. I almost daily saw one while erecting by a speculator, at the very mouth of a low valley, running directly into Charles River, and but a foot or two above the level of the water. On each side of this valley arise high and sandy hills. With each evening sunset, a flood of cold moisture, almost if not quite imperceptible to eyesight, but quite palpable to the sensitive skin of the traveller, settles in between the hills and gradually envelops this devoted house. I have often passed the spot late at night. At times the moon shone clearly on the immediately adjacent ridges, but as I descended from them and passed the house, the rays were obscured, and a chilly feeling came over me, as if taking a cold bath. On these occasions I thought that if there were any truth in this apparent law of soil-moisture, I should hear of its effects on the family residing there. During the first year of their residence, the father suffered with a low and chronic

cachexia. About two years afterwards, the wife consulted me for a cough, that had been coming on insidiously for several months. She was not of a consumptive family. I was not surprised, though certainly shocked, at finding, in addition to rational signs, undoubted crepitus under the left clavicle. I prescribed the usual remedies for early phthisis, but I felt bound then, and have no reason to doubt that the advice was strictly correct, to say that the *first* thing to be done, if safety was to be gained for the patient, was her immediate and permanent change of location to some dry, neighboring hill, or still better, to some place, more thoroughly removed from any dampness. My advice came too late.

I beg you to understand that I do not present this by itself as any proof that dampness of location produces consumption. In this case it may be, and doubtless many of you think it is, a mere coincidence. I have no right, perhaps, to object to that view. *I have, however, had too many of such coincidences.* They, as it were, simply compose the *côplement* of the general evidence to the existence of the law. I therefore regard this one case as more significant than most of you perhaps will, at present, allow.

Let us proceed. I know another homestead in which resides a family of wealth and refinement. It is a sweet rural cottage, overhung with clustering vines, delightfully situated amid shade trees, thickly hemmed in "by a shruberry that Shenstone might have envied." It rests on the borders of a sylvan lake, on a rich, loamy, fertile, moist soil, a few feet only from the water, and scarcely more than a few



inches above its level. In the heats of our midsummer, every passer-by would point out the spot, as one to be selected for its perfect coolness of situation and quiet loveliness. But I fear it is most unhealthy, and for the following reason. The parents occupying it, are themselves healthy, and have had ten children. None have been perfectly robust. Three have already died of consumption. A fourth has it now, in its last stages. The young daughters who remain are, during the day time, some miles away at school, in a high and dry location. They sleep at home. They do not seem so strong as others, and in the eyes of neighbors seem threatened with the disease of which the others died. One son, who is constantly at sea, is healthy.

A previous occupant of this house died of consumption. His family was liable to frequent coughs, while resident there, from which they have escaped since their removal.

All this has happened, and yet I cannot persuade the parents that the pleasant house, in its present location, is the charnel-house of their race, as I verily believe it to be.

Again, pass with me into the interior of the State, and visit another town, very undulating, chiefly agricultural, with one small village, through which runs a stream, between abrupt hills. This place I visited the past summer, in order to see three or four houses, that had been brought to my notice by Dr. Lyman Bartlett, of New Bedford, as proving the truth of the views I have endeavored to bring before you. It was his native place, and he knew whereof

he spoke. No less than three houses he alluded to, as having been nests of consumption. One has only to see them to perceive how entirely their position supports our general views. Two of them are in a low, narrow valley, hidden from the sun by lofty and luxuriantly growing shade trees. The soil, on which they rest, is bursting with moisture, and close by, that is, within a few feet of each, is a mill-stream or pond, the waters from which keep the foundations of the houses perpetually bathed with moisture. Of these I shall forbear here to speak,\* but will enter more into detail about a third — the story of which may be told by the following summary :

1. Four grandparents lived to a healthy old age, and died over eighty years old. One of the grandmothers always bore on her neck, scars, said to be from scrofulous ulcers in early life.

2. Two brothers, A and B, married two sisters, both couples being children of these grandparents. All parties were in perfect health at the time of marriage, and with no thought of consumption ever entering their families.

3. After his marriage, A staid in the old home-stead, situated on a southern slope, a dry and warm, well-drained spot, where he was born, and there all his children were born and reared to adult life.

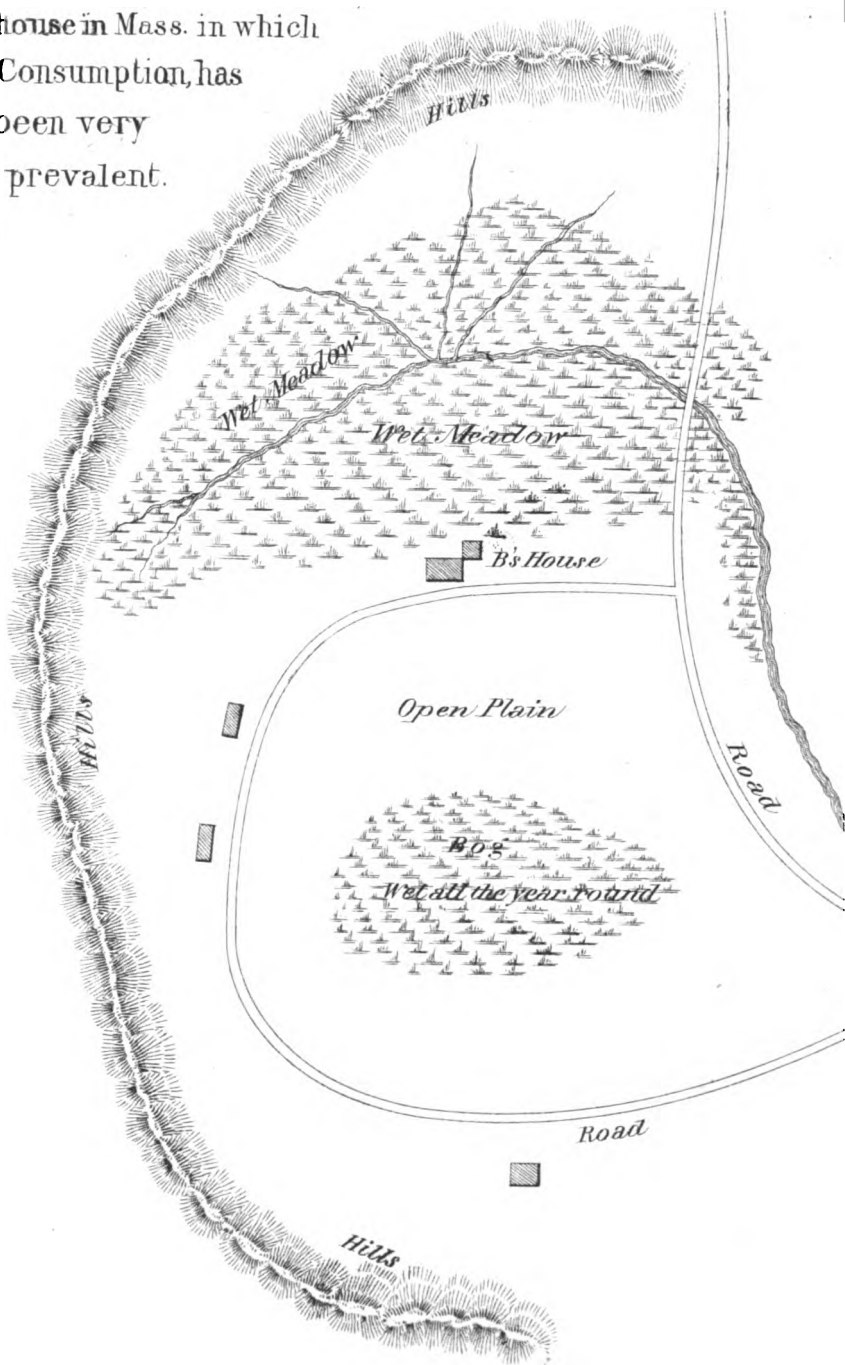
B, on the contrary, moved to a house subjected to wholly different influences, and there his children were born and reared to adult life.†

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\* See Appendix D, for the details.

† The diagram annexed presents the place more distinctly than any mere description. In a few words, it may be said to be situated in a wholly

DIAGRAM showing position of a house in Mass. in which Consumption, has been very prevalent.





The subsequent results in the two families are clearly shown in the subjoined table :

NO. PERSONS IN FAMILIES A & B.		NOW ALIVE.		DIED.						Total Deaths in Family.
Parents.	Children.	In good health.	Consumptive Cough.	Consumption.	Scrofulous Swellings.	Acute Brain Disease.	Acute Bowel Disease.	Diabetes.	Croup.	
A, 2	9	6	....	....	1 quite yg.	1 set. 25	1	....	....	3
B, 2	11	3*	1	6 child.	....	....	....	1	1	9
....	....	....	....	Mother, set. 63.	....	...	...	....	....	....

\* Father and two sons ; the sons having been away from home many years.

The statement of the two families may be made briefly as follows :—Both families, as we have seen, had by one grandmother slight tendencies to scrofula, although consumption proper had never entered into the known tendencies of any ancestor. This was, in fact, a strong belief in the minds of both families.

Of thirteen persons (parents and children), in family B, nine have died ; seven (more than two thirds of them), *by consumption* ; one of croup, and one of diabetes. Of the surviving four (father and three children), one has been for years slowly *suffering* from apparently *pulmonary disease*. The three others, namely, father and two sons, are healthy ; but these two sons have not lived in the homestead for many years. On the contrary, of the eleven persons (parents and children) in family A, three have died

different spot. Low, with hills closely surrounding it ; a wet meadow comes up directly to the cellar wall ; a bog, wet all the year, is in front ; a river is hard by. Moisture is the principal characteristic of the surroundings of the house.

(less than one third), and not one has died of *consumption*, though one died early with scrofula.

The skeptic will shake his knowing head and ask again, What does one example of this kind prove? In answer, I would ask whether, if the objector should find his own family dying around him by the same disease, under like circumstances, and should happen to have read the various correspondence and gained even the meagre, as he might deem them, statistical data I have presented, he would not then deem it the part of prudence to take it for granted that the fate of his wife and children looked very much like an illustration of the law? Whether this be admitted or not, I contend that, until the State or another individual has, by an overwhelming accumulation of evidence, refuted, what they may deem, my small proof, no physician or father ought to dare to neglect the evidence I have, even thus far, laid before him from educated physicians of Massachusetts; and among other data, he should weigh these examples.

I pass over Medway, Pembroke, Tewksbury, Sudbury\*—in all of which are found cases of a similar, though perhaps less marked character, and shall close this part of my subject with the following statement, eminently illustrative of the truth of the law we are discussing. It shows also how this law has been acting for years, is acting now, probably not only in the township I shall name, but likewise in various other places in this Commonwealth—while the public, and attending physicians si~~o~~by, ignoring

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\* See Appendix D, for details.

its fatal tendencies, and allowing family after family to be cut down by residing where, I verily believe, God never meant that man should live and attempt to rear a family.

Many years ago, and before I had arrived at definite conclusions on this subject, I was visiting Franklin, Mass., on professional business, and I asked the physician whether "any portion of his town was peculiarly liable to consumption." His prompt response was "Nay." In a few moments, however, and in continuation of the subject suggested by the question, he said—"But I wish you would explain why three houses in this town have been famed for having had consumptive families in them."

Avoiding carefully all leading questions, and especially any allusion to the vague notions in regard to the influence of soil I then held, I desired him to make a rough drawing of the position of the houses, and to tell me the characters of the soil, on which they were built, and of the vicinity. I give a copy of that drawing in the subjoined diagram.

The houses A B C could not be situated in a position more favorable for an "*experimentum crucis*" of this law, supposing it to exist. Exposed to the north and east, their foundations rest on a soil permeated with water; the base of the hill, on which they stand, being skirted by meadow and pond, so that every north-east wind comes freighted with moisture upon them. Even the warm and genial sun strikes the hill at an angle, and as it were slides *over* rather than lights upon it, not penetrating, as when the rays strike at right angles to the surface



of the soil. Listen to the tale told by these tenements.

In one (A), formerly resided a woman who had been born on the estate.\* She married, and had five children. The husband and all but one of the children sickened and died of consumption. The one surviving child became very feeble, took alarm, suspected the locality, moved away to what he deemed a more healthy location, recovered his health, and is now enjoying a green, healthy old age of upwards of 70 years.

Thus much for the history of this house, previous to the present occupants taking possession of it. These present occupants are not as healthy as farmers and their families usually are. The father has had hæmoptysis several times. The daughter has pains in her back, shoulder and sides of chest, and is under medical care. One son is like this sister. One son is healthy.

The second house, B. Parents and grandparents healthy. Parents have lived here twenty years. Eldest daughter bled—left home and gained in health; returned and died of consumption, October, 1855. Second daughter always at home; died of consumption in 1853. Third daughter has cough, is feeble, and unable to attend school in consequence; is, in the opinion of her physician, a doomed girl, to die of consumption. Fourth daughter, aged 22, has pains in her side; works irregularly; her physician is apprehensive of her. A son had cough at the

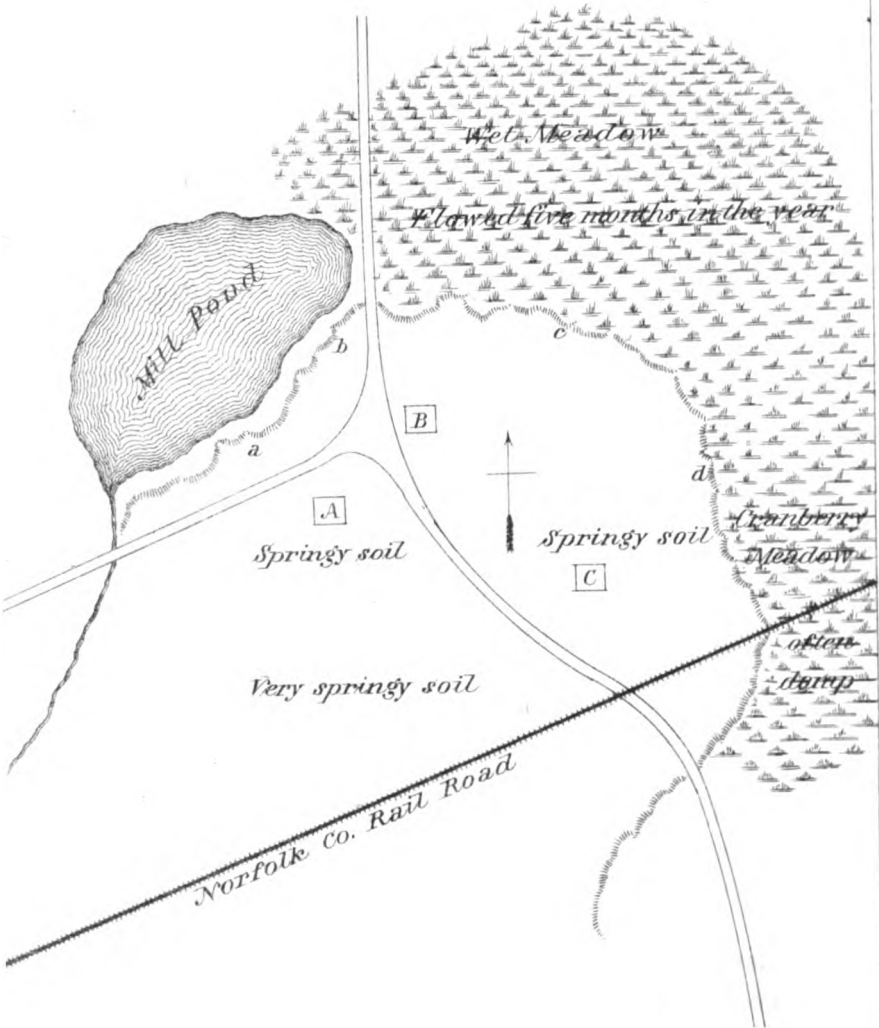
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\* She had five brothers or sisters, all of whom removed from the homestead, and no consumption appeared among them.





DIAGRAM, showing position of three houses, placed on a hill in Mass. in which for 50 past years, consumption has been very prevalent a,b,c,d, outline of base of hill. A,B,C, houses.



old homestead; he left and has improved his health. Second son, 18 years old, with depressed chest; weakly; left home and became better. On returning home, he became worse, and observed that, from *some* cause, he was not so well, felt less buoyant at home than in Vermont. Third son, 8 years old; a pale, sickly child.

The third house, C. Former occupants, parents healthy. Two children died of consumption, one of scrofula.

Present occupants, less healthy than other families in different parts of the town. Father, rheumatic; mother, healthy; one daughter died of consumption, one of scrofula; a son became deaf at eighteen or twenty years of age.

What think you of the illustration? Look distinctly at the facts. Of 14 grandparents and parents, 12 were said to have been healthy. Of the remaining 2, 1 has had hæmoptysis; 1 is rheumatic.

Of 21 children, only 2 have been healthy. Of the remaining 19, 9 have died of consumption; 2 of scrofula; 7 are sickly and weak, or evidently affected with pulmonary disease; 1 is deaf.

Why are so many sick? Why so many dead? Why cannot the children live well at their own homes? I attribute it to the location. If you had had half the evidence I have now given to prove that a damp soil is one of the great causes of consumption in Massachusetts, and it had been applicable to diseases of an intermittent type—fever and ague, for example—you would have had no doubt about

the question, but would have instantly declared the tenements unhealthy. But you doubt, perhaps, in regard to consumption, because it is not one of the medical dogmas of the times that consumption has any local origin, of such a nature as, I think, I have exhibited to you.

Having thus given you some facts, collected in Massachusetts, I pass now to : —

#### VI. — CONFIRMATORY OPINIONS, FACTS AND STATISTICS, FROM RHODE ISLAND, MAINE AND NEW HAMPSHIRE.

I have obtained returns from ten towns without the limits of the State ; viz., from Maine, New Hampshire and Rhode Island. They amply support the views already presented. Briefly given, the reports from these towns are as follows :

Dr. Trafton, of Kennebunk Port, Maine, assures me that consumption is much more rife at the Port, where there is a clayey, moist soil and a coast exposure, than at Kennebunk itself — a fine township, higher, chiefly sandy, with many pine woods, and few, if any, meadows — precisely, in fact, those differences which, I am led to think, will often, hereafter, be found to exist between spots suffering in different degrees from consumption.

Dr. T. also assured me that a house, whose cellar wall is washed daily by the incoming tide (being built directly upon a creek, connected with the ocean), has been the residence of a family, every member of

which, except the parents, *have been born and reared, and have died of consumption, in that place.*

The childless parents have now moved away, in their old age, only to let another younger couple beget another-puny set of children, as those already born are now becoming. Dr. T. mentioned this house to me, in answer to my question whether any household in his town was peculiarly troubled by consumption; and I judged from his remark, that, although he, doubtless, would not have chosen the place as a healthy location, he did not put the location and consumption as cause and effect — which I verily did.

Dr. Marrett, of Saccarappa, near Portland, gives the following statistics, on his own and Dr. Stone's practice.

Dr. Marrett says, "The whole town, with few exceptions, possesses a cold, wet and clayey loam soil." The "plain district has more of a dry, gravelly soil."

Dr. M.'s statistics of his own practice in the whole town, for eight years, 1842 to 1851, were as follows: All deaths, 66; by consumption, 21 — or 31.81 per cent.

Dr. Stone's statistics of his own practice, during the same period, for the whole town, were as follows: All deaths, 104, by consumption, 32 — or 30.76 per cent. In the "plain district" he had: All deaths, 68; by consumption, 11 — or 16.17 per cent.

These data are in complete analogy with the statistics of Townsend, West Newbury, &c., in Massachusetts.

Dr. Allen, of Saco, Maine, than whom there lives no more intelligent witness — a practitioner of long standing — assures me that, in his own practice, for fifteen years past, he has noticed that, on two ridges of land, whose only difference consists of this characteristic of moisture of the soil, almost every family has been decimated on the wet part, while almost all upon the dry portion have escaped. This statement is a most striking exemplification of the views already given. It seems likewise to show that it is not *elevation* or *exposure*, or a certain amount of cultivation or woodland, nor any peculiar trade, &c., that is the cause of the malady; for, in all these respects, the two localities seem alike. One ridge is quite dry, the other is literally filled with springs. Nowhere can a spade be driven a few feet into the ground, without meeting water. In fact, in former times, the superstitious frequently had their friends, who had died of consumption, disinterred, and Dr. Allen invariably found the coffins filled with water, however shallow may have been the graves.

Dr. Sanborn, of Hampton Falls, N. H., gives statistics of that town and of old Hampton, which, at first sight, seem to give little support to my views. But I find, on accurate analysis of the returns, that in Hampton, two thirds of all the cases of consumption occurred on a ridge of land, nearer to the marshes, and where one fifth only of the inhabitants live.

So, at Hampton Falls: the inhabited part, that is, the dampest, has twice as many consumptive cases, in proportion to the population, as the driest and highest.

At Newport, N. H., Dr. Richardson speaks of two houses near a mill pond, and around which runs a river, the entire soil being thus made very moist. The parents, three children and a stranger lady, resident in the family, have died of consumption within four years. *A remaining son and daughter moved away to a drier location, remained cachectic for some time, and have finally recovered*—an example wholly analogous to what we have noticed at Franklin, Mass. How long will you shut your eyes to these facts, and your intellects to their importance, in your daily practice?

Drs. Hartwell and Tuttle, report from Farmington, N.H. Dr. Tuttle says the town is on low, moist land. He and Dr. Hartwell have both noticed that consumption is much more prevalent there than on the surrounding hills. Dr. H., from eighteen months statistics, gives as the number of deaths by all diseases, 43; of which 13 were by consumption—or 30.23 per cent.

Dr. Clough, of Greenland, has a town singularly but very distinctly marked by three classes of soil, viz., 1st, a higher, drier, sandy plain; 2d, a medium, fertile, rather moist portion; 3d, extensive low marshes. I asked for statistics, and he returns these: Population, 715, about equally divided in the districts; families, 150. During 10 years, 1847 to 1857, 3 persons died in the dry district, 5 in the medium, and 10 in the wet. Small statistics, but significant!

Dr. Hovey, of Atkinson, N. H. It is a dry, well-drained township, sloping very gradually to those adjacent to it. The first thought of Dr. Hovey was,

that the statistics of the town, in which he was born and had resided, and had practised medicine nearly fifty years, would not sustain the views submitted in this report. I begged for statistics, as I knew that he was acquainted with all the townspeople who had died. From the general characteristics of the town, I thought there would be but few cases of consumption in it. I was in doubt whether the law of dampness, acting so slightly as I thought it must, would show itself with sufficient distinctness.

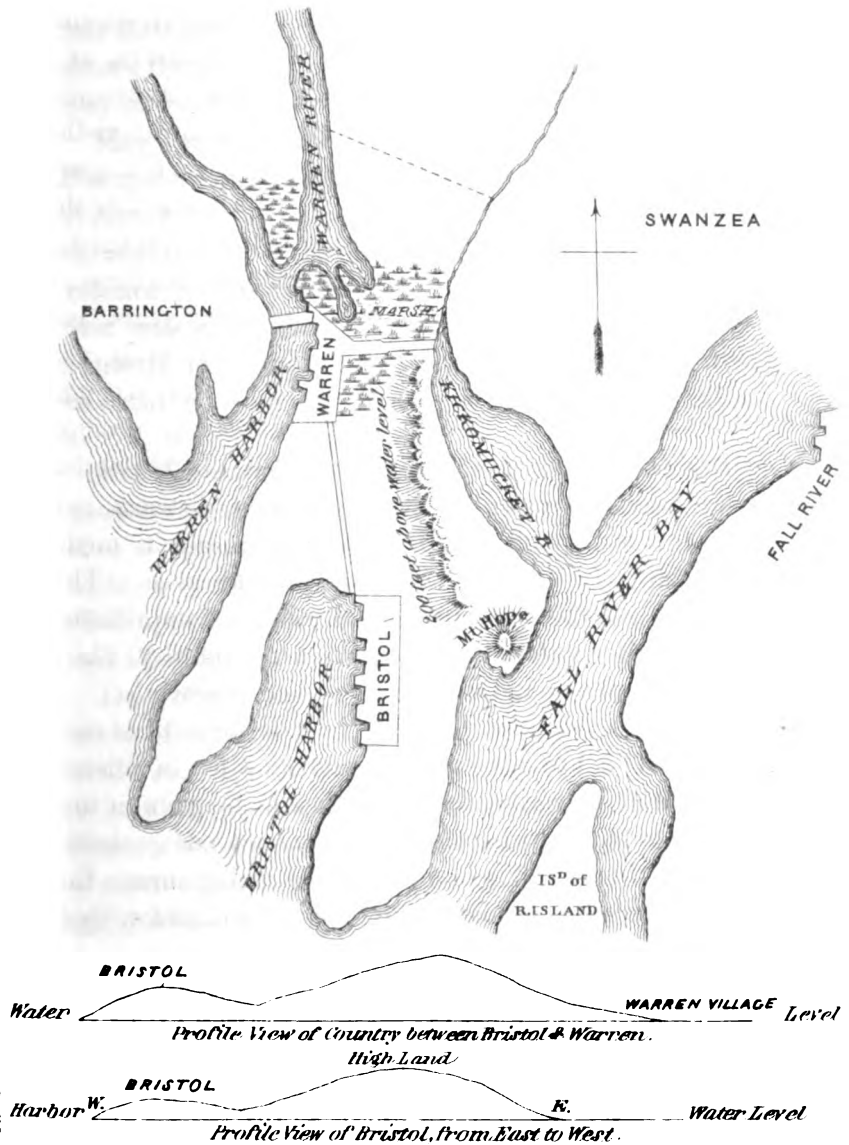
Dr. H. writes, from a review of thirty years, and informs me, while giving the data, that he is convinced, that, though very small, they fully sustain the influence of dampness of locality as productive of consumption. Population, 606. Total deaths, 203; by consumption, 40. In driest districts, one died of consumption in every 56 persons; in medium districts, one in 15.50; in wet, one in 5. The proportion of deaths by consumption to total deaths, he found as follows: 9.75 in the high and dry, 17.64 in the medium, and 50.00 in the low districts.

Dr. Ellis, of Bristol, Rhode Island, has noticed that few persons are affected with consumption in Bristol, compared with the number found in Warren, a few miles distant. Bristol stands on a bold, rocky shore, washed by the waves of a bay, opening upon the Atlantic. It is defended somewhat, at the east, by a line of hills. Warren, on the contrary, is situated low, on the wet land adjacent to the marshes of the bay. The higher tides are apt to overflow them, at times, quite up to the borders of the town. There is, moreover, no defence from the cold easterly winds. It



DIAGRAM, showing relative position of BRISTOL to WARREN, R.I.

From a Sketch, by Dr. J. James Ellis.





is but right to say, that the Rhode Island State Registration Report for 1859 throws some doubt on this statement of Dr. E. That of 1860, however, shows there is an unequal distribution of consumption in the various counties of the State.

May I not say that these data from Maine, New Hampshire and Rhode Island, afford nearly as certain evidence of the operation of this law of dampness throughout New England, as we have for its prevalence in Massachusetts? *A priori*, we must admit that *any* etiological climate-law, acting in Massachusetts, must extend over the New England States, so entirely analogous are they in their characteristics.

But if it extend over New England, an interesting question immediately arises, whether the same influence is spread over the United States. To decide what is public opinion or fact on this subject, I shall appeal to Drs. Forry, Drake, Blodgett, Lawson, and Coolidge, in his United States Army Report.

Dr. Forry\* does not believe in moisture as the cause of consumption, nor that cold, *per se*, is necessarily so. I have the highest respect for Dr. Forry, as an able pioneer in the climatology of the United States; but the subject of soil-moisture, as the cause of consumption, was really never thoroughly discussed by him, as we are now able to reason upon it, from the returns made by the Massachusetts Medical Society.

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\* The Climate of the United States and its Endemic Influences. By Samuel Forry, M.D. New York; I. & H. G. Langley. 1846.

Dr. Drake,\* one of the most vigorous minds and original writers of our profession, enters extensively into the topic, but he cannot grapple with it, as we are able, with our facts, to do. He doubts the effect of humidity, as a cause of consumption. He believes in a dry, cold climate as being rather unlikely to cause it. In this, we certainly agree. He certainly disbelieves the views often entertained, that a cold climate necessarily causes it. He thinks, and I presume all the profession will agree with him, that damp, unventilated apartments are bad for consumptive patients. But you see that he really hardly touches our topic.

Mr. Blodgett† (p. 474) comes nearer to our view when he says of "*climate*," "dry and warm are required for the relief or cure of pulmonary disease." Again: "In warm, very variable, with much humidity, the requisite conditions are wanting." And finally, he enumerates what is perfectly true: "*Dry* (his own italics) and equable districts are the great desideratum, though, in humid and equable climates, it is far less frequently induced than in cold and humid."

Dr. Lawson,‡ in his admirable work on Phthisis (page 241), takes the ground that moisture is a comparatively unimportant agent in the production of phthisis. But he does not really treat our subject,

\* The Principal Diseases of the Interior Valley of North America. Second Series, &c. Philadelphia: Lippincott, Grambo & Co. 1854.

† Climatology of the United States. By Lorin Blodgett. Philadelphia: Lippincott, Grambo & Co. 1857.

‡ A Practical Treatise on Phthisis Pulmonalis. By L. M. Lawson, M.D. Cincinnati and New York: S. S. & W. Wood. 1861.

viz., the damp soil. He speaks of circumambient atmosphere, amount of rain, &c.' But it is evident that Pau, for example, which has much rain, but whose atmosphere is, really, generally dry, owing to the quick absorption of rain by the porous soil, is very differently situated, and may be much drier, and better for a consumptive patient than another spot, where the soil or subsoil is perpetually filled with inherent moisture, and but very little rain falls.

But the most important, and by far the most satisfactory statements in favor of my general views, may be found in Dr. Coolidge's most admirable Reports of the Medical Statistics of the United States Army. To this I now call attention.

VII.—MEDICAL STATISTICS, GIVEN IN THE REPORT ON THE HEALTH OF THE UNITED STATES ARMY; INTIMATING THE EXISTENCE OF THIS LAW AND OF ITS WIDE OPERATION OVER THE WHOLE OF THIS CONTINENT, CONTAINED WITHIN THE LIMITS OF THE UNITED STATES.

Dr. Coolidge\* has made the most valuable report, ever published on this continent, on the health of the soldier in different parts of our country. In reference to the subject in which we feel most interested, I quote the following very valuable opinion, as actu-

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\* Statistical Report on the Sickness and Mortality in the Army of the United States, compiled from the Records of the Surgeon-General's Office, embracing a period of sixteen years, from January, 1839, to January, 1855. Prepared under direction of Brevet Brigadier Gen. Thomas Lawson, Surg. Gen., by Richard H. Coolidge, M.D., Ass't Surg. U. S. A. Washington, 1856. Also Second Report, from 1855 to '59.

ally deductions from facts observed. In the text I shall give only summaries, and refer the reader to the Appendix\* for more and very interesting details on this topic.

After premising that it may be generally considered of doubtful propriety for a compiler to present his own individual inferences, but that, in regard to the amount and ratio of phthisis in the several regions, he feels called upon not to adhere to his original intention of being simply a compiler, he makes the following statements in his first report (p. 497):

“The most important atmospherical condition for a consumptive is DRYNESS.” \* \* \* “Next to DRY is an EQUABLE temperature.” \* \* \* “A uniformly *low* is better than a uniformly *high* temperature.” “The worst possible climate for a consumptive is one with long-continued high temperature and high dew point.”

So, too, if we examine particular facts, given in his second report, they are eminently significant.

Assistant Surgeon Robert Bartholow writes (p. 306), March, 1859, from Fort Bridger, in Utah, “in the upper cold regions,” “very dry” atmosphere, soil of valley “light, porous, sandy, through which the water percolates constantly:”

“The most interesting fact with regard to the influence of this climate upon the thoracic affections, is the amelioration and cure of pulmonary, tubercular disease. Not a single case of phthisis has occurred at this post, and those, who came here laboring

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\* Appendix F.

under the symptoms more or less advanced, are notably improved."

Assistant Surgeon Basil Norris writes, from Fort Clark, Texas, September, 1856: The Fort "is situated on a healthy site, overlooking the surrounding country. It has a *dry* and equable climate." "Pulmonary diseases are rare. The dry and equable climate has been beneficial to a few cases left in the hospital, and at the post none have originated." —(p. 190.)

Similar remarks are made by Ass't Surg. Robert Bartholow on Camp Scott, in Utah (p. 291). "All who came hither, laboring under the incipient or well-established symptoms of consumption, speedily improved." The dryness and equableness of the climate is noted as the most important element in the cure. Conjoined with this, however, were improved hygiene, and mountain height.

From the above, am I not allowed to suspect that the law of moisture of the soil as the cause of consumption prevails in other parts of the United States more generally than in New England?

*Does this Law hold good in other parts of the  
World?*

In order to show more precisely the facts, in regard to the dampness or dryness of various places, and their reputed influence on phthisis, I have endeavored to obtain the characteristics of the soils of various places named, as peculiarly advantageous for phthisical patients, as given by Sir James Clarke, Messrs. I. P. Knox, Dix, Henry Rhind, Alexander Taylor,

Dr. Burgess, John McClelland, James R. Martin, C. R. Hall, Twining, Beddoes, Walter S. Baker, Dr. Jourdan, Lawson, Mühry, Boudin, Poissac and Lombard, writers that treat of all the climates of the known globe. I found as follows :

Places, of whose soil I can find any sufficient account, and which are said to be good for consumptive patients as residences ; for example : Pau, Villa-Franca, Malta, Madeira, Canary Islands, Azores, Bermudas, Bahamas, Undercliff, St. Croix, St. Thomas, Egypt, Nice, Mexico, Algiers, have essentially dry soils, and, though some have great rains, the atmospherical surroundings of the patient become rapidly dry, even after rain.

Others, such as Pisa, Naples, Milan, Parma, Mantua, Verona, Exmouth, Sidmouth, all said to be prejudicial to consumptives, have essentially moist soils.

Notwithstanding all this, Mühry,\* one of the ablest of European writers, doubts the influences of moisture ; but he has no facts, strictly speaking, bearing upon our precise question.

Boudin,† also, an equally great writer on this subject, still holds to the opinion that moist, intermittent fever countries prevent phthisis.

Dr. Lombard,‡ of Geneva, claims nothing for dryness as a preventive. But he and Mühry both

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\* *Klimatologische Untersuchungen, &c.* A. Mühry. Leipsic and Heidelberg. 1858.

† *Traité de Géographie et de Statistiques Médicales, &c.* Par I. Ch. M. Boudin. Paris : Baillière. 1856.

‡ *Les Climats des Montagnes, &c.* H. C. Lombard, Geneva and Paris. Joel Cherbuliez. 1858.



assert that, at a certain height in the Swiss mountains (Mühry states the same of the whole globe), consumption is unknown. They attribute the fact to the rarefied air. I would claim much for the dryness, which necessarily accompanies the height.

The sum total of our investigations into European works is, that, while no writer attaches the same value to moisture of the soil, that I have been compelled to do, from my examination of New England, the fact that so large a proportion of places, famed for giving relief to consumptives, have dry soils, is, to use the mildest term, a peculiar coincidence.

I do not think, moreover, that the subject has ever been fairly investigated with reference to the influence of *soil-moisture* on the prevalence of consumption, as I have investigated it in these researches. In confirmation of this assertion, I would remark, that although I brought the subject (during a visit to Europe in 1859), as fully as I could before men of experience in vital statistics in England, and on the continent, I never found but one person who, practically, could give any evidence on the subject. This gentleman was a physician in the highlands of Scotland, whose name, I regret, has escaped me. He had practised in two valleys, one of which has a great deal of moist soil, and consumption is very prevalent there, while the other is much drier and has much less consumption. The physician had not apparently connected the two facts, in the relation of cause and effect.

VIII.—RESULTS OF MY OWN PRACTICE, SINCE I FIRST BECAME CONVINCED OF THE TRUTH OF THIS LAW.

(a) *Statistics from my private records of Cases.*

Out of 201 patients, from the country townships of New England, distinctly affected both with the rational and physical signs of consumption, such as distinct râles under the clavicle, &c., I find that 109, or more than one half, are reported to be residents *on* decidedly damp places, and one half of the remainder have lived in houses having damp cellars, or their houses are situated *near* damp localities. Thus *three quarters of all these patients have resided, where dampness of the soil is a prominent characteristic.* Somewhat less than one quarter resided in dry places.

(b) *Results of my Practice, when applying this Law to the Prevention or Cure of Consumption.*

Since I became convinced that a residence, on or near a damp locality, is actually promotive of consumption, I have acted fully up to that belief, and have had satisfactory results. The following statements I make deliberately, for they are true. The cases, to be alluded to, have been under my own care. I have seen whereof I speak, in every particular.

*First.* Persons having had hæmoptysis and irritation of the lungs, and who have apparently been threatened with phthisis, but without physical signs, have been completely restored to health, by changing their place of residence, according to the princi-

ples inculcated in this address, viz., by going to live in a dry locality, and leading more active lives. These patients have considered the change of location as the *prime* cause of their improved health, although I did not neglect other remedial measures. They perceived, moreover, the much greater balminess of the atmosphere, in its influence on their lungs, in these places, when compared not only with a city atmosphere, but with that in wet, country locations, very nearly adjacent to their own residences, equally beautiful to the eye, seeming, in fact, to the majority of persons, equally healthy. I am myself acquainted with two such spots, and the ascent of a long hill alone separates them. Doubtless, many of you have noticed similar differences in your own towns. Between the climatic influences of two such localities, when you drive through them, especially at night, when the caloric, luminous, and perhaps still more, the actinic rays of the sun are not shed upon either, these differences upon your healthy bodies appear immense. The two are no more comparable than the mild, equable, temperate atmosphere of a balmy day in September or October, and that we experience during the chilly north-east storms of early spring. Does it therefore seem incredible to you that such differences, even when not so appreciable during the waking hours, may materially influence our health during sleep, when our natures seem most susceptible of evil influences?

*Second.* I have had patients in whom physical signs of an undoubted character existed — such as crack-

ling under the clavicle, diminished vesicular murmur, and some dulness on percussion—who, by removal from towns and localities lying under, or near, the influence of dampness of the soil, to another town very dry, have experienced immense benefit.

In one young lady, crackling disappeared almost wholly from the entire upper lobe of one lung, after a residence of six months in a very dry town, selected for the purpose, because the resident physician assured me that the town was very dry, and that cases of hæmoptysis that would, he thought, have terminated in fatal phthisis, in a town on the coast, where he previously resided, got well in his actual abode. The place was very different from the spot where she was taken ill, and where she resided, when I was first called to her, as hopelessly ill of hæmoptysis and consumption. And yet, were I to show you that very homestead, you would say it was one of the loveliest possible, with its long avenue of wide-spreading trees, on luxuriantly fertile soil; its quaint and picturesque, ancient architecture, indicating apparently that it had been the abode of many generations of families, of refined tastes and ample fortunes. Nevertheless, should you enter it at midday, at the hottest and most sultry hour in August, it would be like entering a cellar. I visited it, panting with the heat of a summer's sun. In a half hour I spent there, I was so chilled that I quickly sought, on going out, the genial influence of the same sun, I had, previously, gladly escaped from, in order to overcome a certain depressing coldness, that painfully affected me. This was the most re-

markable case I ever had. The lady was subsequently married and lived a few years, and finally died of phthisis, under the following circumstances. Having got nearly, if not quite well, she begged, after many months residence at the selected spot, that she might be allowed to come nearer to the city, for the sake of her husband's business. In vain I protested. She, however, decided to remove, and although healthy sites were chosen in the country, ten miles from Boston, none were so dry as that first selected. Gradually, the cough returned, and fatal phthisis was the result.

I have no doubt, however, that life was prolonged by the first change. I think that had she remained at the place at which I first visited her, she would soon have died; and that if she had remained at the place which I chose for her, and where she so rapidly improved, she might be now alive.

I have had other cases of a similar nature, in which the rational signs were very threatening, with slight but unequivocal physical signs. In these, both classes of signs have disappeared under a change of place and rational treatment—the change, however, being deemed an essential element in the treatment, and, in my opinion, the most important part of it.

*Third.* I have had another and equally significant class of cases, in which undoubted and more extensive rational and physical signs of consumption have existed for a year or more, and in whom, even now, the physical signs are sufficiently well marked, though showing less irritation of the lungs; while

the constitutional symptoms are very much better, under similar changes of residence.

In this catalogue are two married ladies, who, for years, have lived in a spot chosen by me because of the dryness of its soil, its elevation above the surrounding country, and its exposure towards the southern sun. These have been ill for several years, and had been so, when I first saw them. Both were living in damp localities; both moved to the place thus chosen, and there they established their family abodes. They have never had a desire for any permanent change. Both, it is true, have occasionally gone south. They both recognize and value the difference of effect upon their own lungs, between the air in the spot selected, and any other they may be called upon to breathe. Especially do they now feel the difference, in this respect, between their present location and the wet, meadowy abodes, in which they formerly resided, and where some of their friends now live.

To sum up the results of my experience, and my present judgment, on this subject, as a matter of therapeutics—I dare not neglect the abundant evidence of the influence of locality, as a cause of phthisis. Deeming it, in fact, one of the great causes of consumption in New England, I, of course, think of it in every case I meet with, and make it a rule to endeavor to learn, more precisely than I formerly did, the nature of the soil on or near which my patient is situated, and especially its character as to dryness or moisture, to which, when at home or on business, he is habitually subjected. If I find a

person living in a house, evidently damp or wet, I feel bound, if he be not hopelessly ill, to urge his instant removal to a drier location. I do this on the same principle that I should direct a man, with intermittent fever, to remove from a so-called malarious district; as I should urge a flight from Charleston, S. C., by a man threatened with yellow fever during its prevalence in that city; or finally, as I should press for the instant removal of a typhoidal patient from the vicinity of a cess-pool. If you ask me why I do so, what cause *can* exist in a damp soil, productive of consumption, I simply point you to these previously given facts and inferences therefrom, and reply that we know no more what is the essential element or mode of procedure of this obscure cause of consumption, than we know of the causes of fever and ague, yellow or typhoid fever, above alluded to. If we wait until we understand the precise operation of causes before we take action, our action is, or may be, vain.

IX. — APPARENT EXCEPTIONS, GIVEN BY DIFFERENT PHYSICIANS, TO THE VIEW OF THE SUBJECT PRESENTED IN THIS ADDRESS.

The correspondents of one hundred and thirteen towns answered categorically and often monosyllabically in the negative, to the question as to the greater prevalence of consumption in one part, than elsewhere in the town. In other words, these practitioners have never seen in their town any particular locality, peculiarly liable to the prevalence of con-

sumption. Thirty-nine of these answered doubtfully in the negative, or suggested some other reason than locality as the cause of its greater prevalence in one part of the town than another — *e. g.* the hereditary character of the affection in certain families, the peculiar trade, bad ventilation, a dusty atmosphere, &c. Two of them only give statistics — *viz.*, Dr. Alden, of Randolph, and Dr. Cotting, of Roxbury. I refer elsewhere\* for these data. I would, however, make the following criticism upon them.

There is a fatal omission in both, *viz.*, that they give no means of comparing the number of deaths by consumption in the wet districts, either with the population or with the total deaths by all diseases. Now it is obvious, that unless we have one or the other of these latter data, we cannot make any assertion in the premises. For example: Dr. Cotting says there were only three deaths near the “mill-pond,” and “but two on the ridge between the empty and full basin.” But unless we know the relative population in these districts, or the total deaths, we are still in the dark in regard to the comparative rate of mortality from this cause. His own table, “Localities of the Deaths by Consumption,” admits of doubt in regard to the conclusions he draws from it. For certainly, Dr. Cotting will allow that much more than two-thirds of the surface of the city of Roxbury cannot be called low. But only two-thirds of all the deaths in the city are found in the high localities, whereas, if consumption pre-

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\* Appendix F.



vailed everywhere alike, we ought to have many more than two-thirds.

It is plain, however, that we argue in vain, owing to the want of a necessary element of the evidence.

Again, it may be remarked, that as Roxbury is a somewhat densely built city, we may not be able to discover the influence of any telluric cause, as easily as in a township, more sparsely built upon, and extending over a larger space, of miles, perhaps, in extent.

“Every year,” says Dr. Cotting, “brings accounts of some new and peculiarly favored locality, and every year brings also statistics, proving that any boasted exemption will not bear the test of careful investigation. From the East Indies and the West, from isles of the ocean and those of the Mediterranean, from Western prairies and from Italian skies, we hear the same stories of the universal existence, prevalence and inexorable progress of pulmonary consumption.” Upon this question I have simply to say, that such men, as Mühry in Germany, Lombard in Switzerland, Boudin in France, Coolidge in America, upon well-authenticated statistics, hold a totally opposite opinion.

Dr. Alden's data are subject to criticisms similar to those made on Dr. Cotting's. They afford no means of really comparing the number of deaths by consumption with the total deaths or population.

I do but justice, however, to Dr. A. in saying that he believes that a residence in a low damp spot is promotive of all diseases, consumption among the rest.

I have thus stated the opinion of those who differ from my estimate of the influence of dampness of the soil, as a cause of consumption.

I turn now to some important practical questions and suggestions, naturally arising from the subject.

ARE THERE ANY LOCALITIES IN NEW ENGLAND WHICH, FROM THESE INVESTIGATIONS, WE SHOULD DEEM UNFITTED FOR THE RESIDENCE OF CONSUMPTIVE PATIENTS?

I believe that all towns, parts of towns, houses even that *rest on* damp, cold soils, are by that very fact peculiarly liable to the prevalence of consumption. I believe that similar locations *near* wet meadows, rivers, marshes, &c., though less subject to the law, are nevertheless, in a lesser degree, promoters of consumption in the families resident thereupon. Even hills, with a clayey subsoil retaining moisture, though not absolutely evil, are less good than a perfectly dry, porous soil, removed from any moisture. I suspect, moreover, that we ought to inquire more particularly than we have heretofore done, as to the exact condition of the cellar of a residence, whether it be damp or dry, even when the surroundings of the residence may seem perfectly good. All these statements I make, not on theory alone, but from actual experience, I think, of their truth, as learned from my professional practice during the past four or five years.

Again: on theoretical, but I believe just grounds, I have objected to allowing consumptive patients to

reside in houses, *heavily and closely* shaded by trees and vines; because the rays of the sun being prevented from reaching such abodes, dampness and extra coolness are thereby promoted. I know of a house, which I should deem unfit for a consumptive to reside in. It is situated in New Hampshire, about fifty miles from Boston, on rather a low spot of ground. Its wooden sills rest, almost immediately, on the wet soil. Trees, thick and close, overshadow its roof, and woodbines cover its walls. When I visited it, one consumptive child was dying, and the sister was beginning to fail. I objected to the trees and vines, as tending, in that instance, to promote dampness and coolness, as above described.

Following out this idea, I have at times *thinned out* trees around a residence, where a family was growing up, and among which one had already shown signs of tubercular disease.

Looking at the subject from the opposite standpoint,

ARE THERE NOT PLACES WHICH, ACCORDING TO THESE INVESTIGATIONS, WILL TEND TO PREVENT PHTHISIS, OR AT LEAST, IN WHICH CONSUMPTION WILL PREVAIL MUCH LESS THAN ELSEWHERE, OR POSSIBLY NOT AT ALL ?

I do not absolutely know a single spot in New England, where consumption can be said, by statistics, never to have occurred. In choosing a site for a dwelling-house, the great desideratum is to obtain, not a perfectly *arid* place, for no such spot could be

inhabited by man, but it should be in a portion of the township which is neither so high as to be exposed to violent gusts of weather, nor so low that moisture will collect around it. Let it be on the side of a hill, or plain, open to the south, and, if possible, defended from the north and east, on a dry, porous soil, through which water freely percolates, and which, even after a rain, retains little moisture. Let the cellar be dry, in which no mould will collect. Such a situation, I believe, on theory (confirmed by my general experience), if it can be found in any town in New England, will be more favorable for the consumptive, and less likely to have consumption appear in it, than another spot, with a different exposure, and having a wet soil. So much for theory.

PLACES WHICH EXPERIENCE HAS TAUGHT ME ARE  
RESIDENCES FAVORABLE FOR CONSUMPTIVES.

There are two distinct classes of townships and localities, which I should place in this category. They are either inland towns, or islands eight or ten miles from the shore, and thereby being, in reality, under an oceanic climate. Doubtless, there are many more localities, besides those I shall name, scattered in almost all the inland portions of the New England States. These spots must be eventually discovered by the registration agents, or by the careful and conscientious investigations of resident physicians. I have had actual experience of the advantages of placing patients at Grantville, a district in the township of

Needham; also upon the drier portions of Sharon and of Canton, and at the Isles of Shoals. All these towns lie about ten or fifteen miles inland, while the islands are about the same distance from the coast. The former have the land; the latter, the oceanic climatic influences. The townships are remarkable for the dryness of their soil, and are generally somewhat elevated. In every one of them, I have had patients improve greatly, and some, whom I believe would have died in low coast, or wet inland spots, have recovered, or have speedily improved from serious symptoms. The patients have all described a decided and peculiar effect, as having been produced on their lungs by the atmosphere of these places, whereby they were enabled to breathe more easily.

The Isles of Shoals are off Portsmouth, New Hampshire. From the reports of physicians I have little doubt that Nantucket, Martha's Vineyard, and possibly Block Island, lying south of Massachusetts and Rhode Island, must be likewise useful.\*

It may be objected, that in suggesting an island, I virtually ignore all my previous statements, in regard to the influence of moisture, as a cause of consumption. I answer, 1st—That it is evident that a small island, with an oceanic climate, may and probably would produce very different effects on a patient from those caused by a place on low and damp land. Hence the two places are evidently under wholly different influences. The two spots are not analo-

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\* I am also inclined to believe that Nahant and Winthrop, rocky promontories projecting from the coast, will prove favorable sites.

gous. But, 2d—In the places I have named, I, in reality, do not vary from the rule of dryness of the soil, for all of them are either mere rocks, rising out of the ocean, with no marshes near, or they are masses of sand, so to speak, and essentially dry of character. Hence they do, in reality, fall within the rule—only they have the oceanic atmosphere instead of the land atmosphere, encircling and covering them.

Whether this is really a correct explanation or not, I am certain that, in many cases of early phthisis, the tonic, clear, soft air of the Isles of Shoals, in summer, has been of immense service. Two patients spent the winter there. In one patient, a crackling throughout the whole of one breast disappeared, which I fear it would not have done, had the patient remained in Boston. The winds were violent, but the temperature was less severe than in corresponding places on the shore. These winds will, however, always prevent many from residing at the Shoals during the winter, unless, perchance, the inherent healthfulness of the situation, and the superb marine views, that one can enjoy there, should, in some future time, cause a Sanatorium to be erected, properly constructed to obviate, at least in part, these difficulties.\*

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\* It is part of my medical faith, that, within fifty years, our community will occupy this and its kindred islands, as places peculiarly fitted for many of our citizens, who prefer to remain near home to seeking health further south. They will be in some measure, to New England, what the Isle of Wight is to Great Britain, although the beauties of the two places will be forever very different, and the climate of the Shoals less gracious than that of the mild, almost tropical, airs of Undercliff, or that of the islands of Nantucket, Martha's Vineyard, on our own shores, which experience some of the genial influences of the Gulf Stream.

GENERAL SUMMARY OF THESE INVESTIGATIONS, AND OF, WHAT I DEEM, THE LOGICAL INFERENCES THE PUBLIC AND THE PROFESSION SHOULD DRAW THEREFROM, WITH SOME REMARKS ON THE DUTIES OF THE STATE, OF THE PUBLIC AND OF THE MEDICAL PROFESSION, IN RELATION TO THE SUBJECT.

Commencing these investigations without any thought of ever arriving at these results, but simply with a hearty faith that every sincere student of God's laws on this planet will always find *more* than he can dare hope for, I have been led to, what I deem, one of the most important results of my professional studies.

By the examination of the State Registration Reports, all imperfect as they are; from the opinions of physicians, given in correspondence to me from one hundred and eighty-two towns in the Commonwealth; from the still more valuable statistics, afforded by some physicians in Massachusetts and her sister States; from the Army Reports; and finally from my own experience in practice, I have come to a firm belief in the following propositions:—

FIRST. *Consumption is not equally distributed over New England.*

SECOND. *Its greater or less prevalence depends very much upon the characteristics of the soil on, or near which the patients affected with it have resided.*

THIRD. *Moisture of the soil is the only known characteristic that, so far as our present investigations have gone, is connected with the consumption breeding districts.*

FOURTH. *An attention to this law in the development of consumption in New England (now first, nearly, if not quite, proved to be true, by the analysis of the data which your courtesy has afforded me), I have found of great advantage in my professional practice.*

To the first three propositions, I have given you, I hope, sufficient evidence to command your close attention hereafter, in your various circuits of practice, even if they do not immediately gain your implicit belief. To the last proposition you, of course, will give just that amount of credence you think due to my judgment and my integrity.

But give me leave to say still further, that you have no right, I think, as honest men, to throw aside evidence, however trivial in certain respects it may seem, with an ill-suppressed sneer, or the simple remark that you, as individuals, cannot find any proof of the truth of my statements, in your own city or township. By so doing, you virtually declare that all the evidence given by your friends and neighboring physicians, throughout the State and adjacent States—quite equal probably to yourselves, in their opportunities and powers of observation, and from which evidence I have simply drawn out the essential truth—is of no worth whatever against your own individual opinion.

Allow me to press this view still further home upon your intellects and consciences, by a renewed appeal to the terrible mortality from consumption, already alluded to (p. 88), and my remarks thereupon. Let me, also, in this connection ask, if it be not



possible that some of the cases of what is now evidently hereditary consumption, in certain families, may not be really the legitimate results of some ancestor's unfortunate place of residence. This may seem a peculiarly fanciful suggestion, but is by no means incredible. Although we cannot, at present, solve this and other important questions, naturally connected with the subject, I claim that the data, already given, ought, at least, to command the earnest attention of every member of this society.

*If these things are so, what ought the State, the individual private citizen, and the Medical Profession, to do in the premises?*

Let me say a few words on each division of this subject.

(a) The State has been and is now recreant to its duties, as a conservator of the public health, in not having, long ere this, carried out not only this but similar investigations upon all the diseases of New England. When I commenced my investigations, I arranged my questions with the sole purpose of comparing the results, obtained from my correspondents in different towns in regard to the hygiene of the towns, with the mortuary statistics of each, as given by the State Reports. I spent many precious hours examining the original records in the archives at the State House. But I finally gave up the attempt as utterly vain, as I found that they were, at that time, unreliable for particular towns, though, for the State at large, some general averages might be obtained. I hope, under the new law, better

things are done. But I sincerely believe that very little of valuable information on the topographical distribution of disease will ever be accomplished, so long as the registration of vital statistics is left in the hands of men, non-professional, and who have no just appreciation of the difficulties or the value of such investigations. The State has spent its thousands for registration, and whatever good may have been done by the money thus spent, it is a lamentable fact, as has been stated by one writer, that if the Commonwealth wanted to know where would be the most healthy location for the site of a hospital, prison, or almshouse, it could not obtain the information from its own records; and to-morrow, if the question were on the selection of a site for a normal school, it would be decided as much by the money power, as by hygienic laws. Such institutions should be perfectly situated, and able to carry out all hygienic laws. The normal school should not only teach these laws, to our future teachers, but the school, hospital and prison should be themselves models, in every respect, of obedience to those laws.

As much should be done by the legislature for public health, as is done by it for agriculture and education. Certainly, a Board of Health, composed of the ablest of the profession, and of others interested in vital statistics, is quite as important as Boards of Agriculture or of Education. Such a board could properly investigate every question of this kind, and if efficient, and armed, as it would be, with all the power of the State, it would gain data for the elucidation of any medical question, which no private individual could obtain.

(b) The public should correct its own views upon the whole subject of the planting of cities and villages. It should not allow speculators to run the risk of contaminating every family that may subsequently colonize a spot, the best fitted, perhaps, for the promotion of consumption. Now, the track of the railway, or the wit or reckless energy of the owner of some swamp, may be the sole reason for erecting a station house, and thereby promoting the early erection of dwelling-houses near by, on localities totally unfit for human habitations. I know of, at least, two villages thus built, in total contravention of this law of consumption. To one I am called, I think, oftener for cases of consumption than to any of its neighboring townships.\*

Such villages might probably be much improved, if not made perfectly healthy locations, by thorough *under-drainage*. The public, however, is not aware of the value of such drainage. It may be that the suggestion will seem an infringement on private rights, but I am inclined to think that this whole matter of the location of cities ought to be somewhat more under the control of law, than it is at present. No man or body of men has a right to set up a nuisance. If a man has not wisdom or generosity enough to forbear inviting the public to live in locations that are, in themselves, nuisances of the worst kind, then public law ought to restrain

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\* This village was commenced only a few years ago, and the greater part of the land directly adjacent to it can be put under water at any time, according to the caprice of a mill-dam corporation, which commands the village stream. Can anything be more absurd?

him, as it would restrain him from doing any other obviously evil thing to the community.

(c) What can private individuals do in this matter? Let every one, if possible, keep himself and family away from any permanent residence in a house whose foundations are constantly surrounded by the exhalations from a damp soil of meadow or marsh, or even hill, that is full of springs, and which consequently keep the cellar of the habitation moist and cold. If perchance ignorantly he has erred, and finds a puny set of children growing up around him, in a house thus situated, let him take warning and flee from it, before it be too late. This is no fancy sketch. Our statistics prove the possibility of a childless old age, in consequence of too long a residence in such a place.

*What should the Profession do, in reference to this Subject?*

Finally, Gentlemen, what ought the Profession—what ought we, individually, to do in our respective localities, and as members of a Profession which ought to be the proper guardian of the Public Health?

*Persuade the State to establish a Board of Health.*

We are bound, as already stated, as a body, not to let the Legislature have peace from our annual petitions, until a system of investigations, similar to, though more thorough than that which I have presented in this Address, shall be made on the topographical distribution of all diseases, by an able and

appropriately elected State Board of Health. I may seem unduly earnest, but it appears to me that our Society could not do a better act, one that will eventually be of more service, not only to the inhabitants of this State, but, by its example also, to other States, than by united and persistent effort to induce the State authorities to establish a State Board of Health, by whose agencies all these great questions, now utterly ignored, may be investigated. Under such a Board, and with such objects, vital statistics would become a matter of much more personal interest than it is at present.

*Endeavor to use this Law in a Prophylactic point of view.*

But the results at which we have already arrived, even in these investigations, ought to come home, I think, to the judgment and consciences of every member of the Society, in his daily walk of practice. There are, I doubt not, in every township, one or more families, that are slowly being undermined in health; members of them are either preparing to fall victims to consumption, or, if perchance they escape with puny constitutions, their offspring may be essentially cachectic and tuberculous, thus entailing misery upon generations yet unborn. And all this is being done, as I fear, in pure ignorance of one of the great primal laws of the development of consumption in New England. You will readily imagine what I, at least, claim, that it would be the duty of every member of this Society to do in a like case. He should declare, in terms not to be misun-

derstood, that as parents who go on year after year, living in such an abode and having children born unto them, are virtually the makers, so they are by as certain, though perchance slower process, the slayers of their race! This doubtless seems severe; and in avowing such an opinion, in any particular case, you may meet not only all the violent opposition arising from ignorance of Nature's law, but also the more powerful influence of pecuniary interest—of affection, perhaps, for a venerated homestead. Parents may perhaps have entered the abode after confirmed adult life. They may have lived many years on the spot. Every birth has added a new charm, and a new and sweeter association to it. Their own healths have not been *materially* influenced. They will argue, as they may think, very philosophically, when saying, "We have lived here twenty years, and *we* have not died of consumption. How, then, can it be the abode that produces the disease in our children?" This is also, Gentlemen, no fancy argument. Almost the precise words have been used to me. In vain, perhaps, will you say that the argument wholly falls to the ground, because the two cases are not alike; the tender and sensitive nature of childhood being much more susceptible to all external impressions, than is the hardened nature of adult life.

The reasons why our argument fails of its object, and the parents still cling to their fatal abode, may be various, but one of the most cogent is the fact that neither public opinion nor the opinion of physicians has ever taken the ground I now assume.

To that point I would endeavor to bring you, and, through you, the public at large.

*Use the Law in the Treatment of individual Cases of Disease.*

But we shall all be thrown more closely in contact with the operation of the law of soil-moisture, when we come to the treatment of individual cases. I would draw your attention to a few of them.

We may meet with a patient suffering under what is sometimes inaptly called the "pretubercular condition," where there is a general disturbance of the system—a *good-for-nothingness*—a languor, in fact, of body and soul, in the performance of their functions, perhaps a slight dyspepsia, some emaciation and debility—a little cough, but without *physical* signs of pulmonary disease. If such a patient have been residing under the circumstances named in this Address, as promotive of consumption, *it will be our first duty to urge him to leave the spot.* If he be living in the northern rooms of the house, where no sun can reach him, especially if the rooms have a damp, bleak exposure, he should remove to one which is bathed with the warm rays of noon. I have, in two cases of debility analogous to that described, seen great and immediate benefits result. One patient delighted in sitting hour after hour with the full force of the sun lying upon her whole form below the head. She seemed to imbibe strength and life from this, to her, novel sun-bath.

Do we not all of us, even while in perfect health, unconsciously recognize by our lungs, if in no other

way, the oppressiveness of a room which, during any period of the year, has been, for any reason, shut from the sun's rays, even for a single day? We do not breathe as easily, and the mind becomes sluggish in such a place. How much more, then, should we guard those whose lungs are threatened with disease, from this extra suffering! Yet how utterly regardless is this community of all consideration of the influence of sun-light on health, though very earnest, perhaps, when the question arises of preserving the color of a fine painting or the brilliant hues of an expensive carpet! I write not poetry, but simple fact, when I say that on these occasions, sometimes, in our gross ignorance of God's laws, we risk blanching the human "face divine," in our eager desire to preserve a mere work of art or an expensive luxury. Pardon this apparent digression from the main current of our investigations, to which I now return.

Still more should a removal be urged if any, even the most trivial, of physical signs of pulmonary disease be found. A short distance, even of half or quarter of a mile, may do much good; but I should prefer to have such a patient remove at once to one of the places already known, or which may hereafter be found to be drier and more favorable for him. It has been stated that, in my zeal for retaining our patients in Massachusetts, I oppose entirely their removal to the more southern climates of Florida, Cuba, and of Europe. Nothing could be further from the truth; but where one is able to travel for health, thousands are fastened by the iron grasp of necessity to their native soil, and to but a very small space of



even that. They cannot leave their own village. This law offers up some chance for even these.

*Use it so as to cut off one of the main Causes of Consumption in New England.*

But the most important result, that I hope will arise from these investigations, is on the future *prevention*, rather than the cure of phthisis in Massachusetts. We have, in a previous portion of the Address, seen that, in some townships, twice or thrice as many die in the wet as in the dry districts. If this be so, and if an analogous state of things exists generally in Massachusetts, we must so indoctrinate our people that all wet spots shall be avoided as places of residence. No villages should be allowed to be planted on wet meadows or such like places, however much cupidity or convenience to railways may tend to induce capitalists to place them there. I am well aware of the evil influence such an opinion would have upon many public and private residences, now or hereafter to be occupied, while it would justly raise others in the estimation of the people. If, however, consumption can be, in the least, checked by such doctrines, it is our duty to proclaim them, in spite of all considerations of a pecuniary nature. If we once bring the public to this belief, we shall cut off, if not the "tap-root," at least one of the principal roots of consumptive tendencies in New England.

In conclusion, Gentlemen, let me say, that, I am sure, you will not doubt that I have full confidence

in the truth of every assertion I have presented to you ; and let me beg each one of you, in terms similar to those I used in commencing my Address, to ponder well what I have presented, and to bring it all to the test of your unbiassed daily experience. If the law I have announced be founded in Nature, it will stand, in spite of your individual opposition. If, perchance, I have unwittingly led myself and others towards error, by your efforts shall I, and many more who now believe as I do, be sooner brought back to Truth.