Malaria in Boston and Vicinity.

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MALARIA IN BOSTON AND VICINITY.[1]

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THAT malaria has within a few years made for itself a home in the valley of the Charles and other rivers in the vicinity of Boston is well known; and that it has even invaded Boston is forcing itself on the attention of physicians. Being impressed with the number of cases of malaria in my summer service in the out-patient department of the Massachusetts General Hospital, it seemed to me of interest to collect all the cases that have been recorded at the hospitals of Boston during the past ten months, classifying them according to locality, and to present them here to-night as an introduction to the discussion of the subject. As a further aid to the discussion, let me first sketch briefly the interesting history of intermittent fever in Massachusetts; and for this I am indebted to the valuable papers of Dr. Oliver Wendell Holmes,[2] Dr. J. F. Alleyne Adams,[3] Dr. Zabdiel B. Adams,[4] and Dr. C. H. Cook.[5]

The first settlers in Massachusetts found malaria here to contend with; but, towards the latter part of the seventeenth century it entirely disappeared, and was

[1] Read before the Section for Clinical Medicine, Pathology and Hygiene of the Suffolk District Medical Society, November 16, 1892.

[2] Facts and Traditions respecting the existence of Indigenous Intermittent Fever in New England, Boylston Prize Essay, 1836.

[3] Intermittent Fever in Massachusetts, Massachusetts Board of Health, September, 1881. Malaria in New England. Public Health Papers of American Public Health Association, vol. vii. The New Lenox Malaria case, Boston Medical and Surgical Journal, December 28, 1882

[4] An Epidemic of Malaria in Eastern Massachusetts, Massachusetts Medical Society Communications, 1889.

[5] A Study of Malarial Fever in Eastern Massachusetts. Massachusetts Medical Society Communications, 1886.

not seen till one hundred years later, about 1793. It then appeared for several years in Hopkinton, Mass., as well as in the western parts of Massachusetts and Connecticut. It is of great interest to note here that Hopkinton is situated at the head-waters of the Sudbury, Charles and Blackstone Rivers, along whose courses malaria is now prevalent. From 1799 to 1828 malaria disappeared, except in Sheffield in western Massachusetts, where it occurred from time to time. From 1828 to 1836 malaria for a third time became epidemic in the regions already noted, and again vanished. In 1850 we hear from it again near New Haven whence it spread along Long Island Sound, and "began, in 1864, a northern invasion following the rivers in the western half of Connecticut, reaching the Massachusetts line in 1877, and, in the next three years, penetrating almost to the northern border of that State." [6] Unfortunately the disease has remained endemic wherever it has obtained a foothold.

Eastern Massachusetts, however, continued practically exempt from malaria until 1885, when malaria became epidemic in South Framingham, and in the following year in Natick — towns in which there are marshy lands in connection with the Sudbury and Charles River systems. Since 1886 the disease has followed the whole course of the Charles River, and has also extended along the Sudbury and Blackstone Rivers,— the three rivers previously mentioned as having their sources in Hopkinton.

I have collected all the cases of malaria in the out- and in-patient departments of the Massachusetts General, Boston City and Children's Hospitals, and also at the Boston Dispensary, for the ten months beginning January 1, 1892, excluding from the lists those who may have acquired the disease elsewhere than in eastern Massachusetts. I wish to thank the various

[6] J. F. A. Adams: Malaria in New England, loc. cit.

members of the staffs of the hospitals for the use of these cases, and particularly Dr. Henry Jackson, who, with considerable labor obtained for me the City Hospital and Dispensary cases.

	Cases.
Massachusetts General Hospital	94
Boston City Hospital	61
Boston Children's Hospital	9
Boston Dispensary	43
Total,	207

No cases of malaria occurred at the Boston Lying-in Hospital.

There were many more males than females affected, there being 138 of the former and 66 of the latter. Thirteen were children. The type of the disease was more often tertian although a comparatively large number of quotidian cases occurred.

Quotidian	43
Tertian	106
Irregular	6
Not given	52
Total,	207

The prevalence by months is given in the following table, the disease being most frequently seen during the hot weather.

	Cases.		*Cases.*
January	4	July	35
February	3	August	43
March	4	September	41
April	11	October	19
May	15		
June	32	Total,	207

I have records of the condition of the spleen in 107 cases. In 84 of these it was found to be enlarged. In 33 cases in the house and in the out-patient department at the Massachusetts General Hospital the blood was examined, the *plasmodium malaria* being found in 25 cases.

The locality where the disease was contracted is, however, the chief object of this paper; and I have

placed in the following table the towns from which the cases came, arranging them in order by the river-courses on which they are situated.

	Cases.
CHARLES RIVER.	
Natick	4
Wellesley	1
Needham	3
Dedham	2
Newton	10
Newton Upper Falls	2
Newton Lower Falls	5
Riverside	1
Waltham	5
Chestnut Hill	2
Brookline	2
Brighton	2
Cottage Farm	1
Cambridge	17
NEPONSET RIVER.	
Canton	1
Hyde Park	4
Mattapan	1
SUDBURY AND CONCORD RIVERS.	
Framingham	1
Saxonville	2
Concord	2
Lowell	1
SAUGUS RIVER.	
Wakefield	3
Saugus	1
West Saugus	2
Revere	2
MYSTIC AND MALDEN RIVERS.	
Winchester	2
Belmont	1
(Cambridge near Fresh Pond, 5.)	
Malden	2
Everett	2
Chelsea	2
Somerville	6
Charlestown	5
East Boston	1
Total (excluding 5 in Cambridge counted twice)	99
East Braintree	1
Tewksbury	1
Rockland	1
Total in vicinity of Boston,	102
Boston	105
Total cases,	207

It will be seen that 102, or one-half of the cases came from the vicinity of Boston, 105 coming from Boston itself.

The rivers are the Charles, Sudbury and Concord, Neponset, Mystic and Malden, and Saugus Rivers. The intimate connection of the Sudbury and Charles Rivers at their source has already been mentioned. At Framingham and Natick the rivers are also closely connected. At Hyde Park there is a direct connection between the Charles and the Neponset Rivers by means of Mother Brook. The Newtons that are not directly on the Charles River, are thoroughly permeated by brooks which flow into that river, one branch flowing through Hammond's Pond at Chestnut Hill. Brookline is bordered by Muddy River, which extends from below Jamaica Pond through the new Back Bay Fens to the Charles River. A branch of Muddy River flows through the lower parts of Brookline. The Mystic and Charles Rivers join at their mouths. The head-waters of the Mystic and Saugus Rivers are not widely separated.

It will be seen by the table that the towns on the different river systems in the vicinity of Boston were well represented at the hospitals.

Outside of these river systems were one case from East Braintree, one from Rockland and one from Tewksbury. As was before remarked, all cases that originated away from Boston or vicinity were as far as possible excluded.

The seventeen Cambridge cases are so scattered in East Cambridge and the Port as well as in Cambridge proper, that no conclusions can be drawn except from a group of five cases on Concord Avenue and Cushing Streets close to Fresh Pond. A branch of the Mystic River, Alewife Brook, comes from this pond.

There are 103 cases from Boston itself, excluding Charlestown, East Boston, Brighton and Mattapan,

which are entered under the table of rivers, but including South Boston, Jamaica Plain, Forest Hills, Roxbury and Dorchester. The criticism may, of course, be made, that these cases in the city may have acquired the malaria in the out-lying districts, even if they have not lived in a malarial country elsewhere. Workmen, for example, while living in Boston may go out to the Newtons to work by the day. Some errors may undoubtedly come in in this way, but the large number of cases in the city recorded at the hospitals in the space of a few months would certainly point to its originating here. Another strong evidence of this is to be found, as I shall point out, in the distribution of cases in the city.

For perhaps ten years or more physicians have seen an occasional case of malaria in Boston which appeared to have originated within the city limits. The number, however, has been very small, and is not to be compared with the increasing number of cases now, beginning after the first epidemic in the valley of the Charles at Natick in 1886.

Of the 103 Boston cases, the exact locality of each is known in 86; and I have carefully plotted them on the map, in order to determine, if possible, whether there were any particular parts of the city especially subject to malaria, and whether these parts owed their liability to old water-courses or marshy situations.

In the city proper the cases are most numerous at the West End in the neighborhood of Poplar and Brighton Streets, while the very populous North End is but sparingly represented, eight cases only being found there. There is another bunch of cases in the South Cove district. The nearness of these two districts to the Massachusetts Hospital and the Dispensary may explain this localization and have no other significance. I simply give the facts for what they are worth.

The occurrence of nine cases in South Boston along

the shore of South Bay, with only two other cases in the rest of South Boston certainly seems to be a significant fact. There are three cases on the Boston proper side of the bay, in Ward 20.

Farther south there are three cases on the shore of Dorchester Bay, two being on a small inlet or creek near the mouth of the Neponset River. The only other case from Dorchester was from Lauriat Street, which I will speak of presently.

The remaining cases in Roxbury, Jamaica Plain, and the Lauriat Street case in Dorchester, look on the map so scattered as not to be worth our consideration. On looking closer, however, it will be seen that nearly all of them are beside Stony Brook or one of its branches. This brook arises by two main branches, one of which begins in Hyde Park not far from Mother Brook, the bond of union between the malarious Charles and Neponset Rivers. This branch flows through Clarendon Hills and Mount Hope, receiving on its way a small brook which rises close to Lauriat Street, Dorchester. At Forest Hills the Hyde Park branch unites with a small branch from West Roxbury and Roslindale. There are several branches below this, the two chief ones coming in from the West near the Forest Hills and Jamaica Plain Stations. The brook finally disappears into an underground passage near Pynchon and New Heath Streets, to emerge again and join Muddy River in the Back Bay Fens. There are ten cases in the Roxbury, Jamaica Plain and Forest Hills district whose residence is known, besides three others from Jamaica Plain whose exact residence is not known. Seven of the ten are close to Stony Brook or its branches, namely, one on Lauriat Street, one on Keyes Street and one on Boylston Street, a branch of the brook running between these streets; two on Union Street, right beside the brook. One on Bickford Street, close to a branch; and one

on Vale Street, near another branch. The three other cases were at a distance from the brook; one of these, however, lived at the end of Eliot Street next to Jamaica Pond. There were also several cases near the outlet of Stony Brook in the Back Bay Fens. It would seem reasonable, therefore, that malaria should be found in the Back Bay near the Back Bay Fens, even if it did not extend to a distance from this park, as the imperfectly drained soil made by filling-in must be easily permeated by the waters of Stony Brook and Muddy River. Cases from this region did not, of course, apply at the hospitals for treatment.

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