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Original Articles.

TYPHOID FEVER.

SOME UNCONSIDERED HINDRANCES IN ITS PROPHYLAXIS.*

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For fifty years we have known that drinking water is the chief vehicle of typhoid infection, and this knowledge has enabled great cities to make measurably effective defense against typhoid fever. For more than twenty years it has been known that the whole problem of preventing typhoid fever lay in the disposal of typhoid dejecta. Knowing so much, it would seem that typhoid fever might have long since been reduced to insignificance as a cause of death. But the bad eminence of the disease is as conspicuous to-day as it was twenty years ago.

In the grewsome story of typhoid among the United States troops during the Spanish-American War, we were confronted by a fact so humiliating that the profession has not yet had courage to consider fully its great significance. We learned that of every one hundred cases of typhoid fever sent to division hospitals, one-half had escaped the diagnosis of regimental surgeons. This enormous defect of professional skill was exposed, not by typhoid in its rarer and more subtle disguises, nor by the very mild infections, but by plain, uncomplicated typhoid fever, which puts a man to bed for three to six weeks; such typhoid as all physicians see year after year and recognize five or six times in ten. Restrictive measures can avail us little if the enemy can maintain effective disguise while fully armed and accoutred. The failure of definite and effective means to restrict the prevalence of typhoid fever is chargeable primarily against American medical schools, which do not teach young men to recognize the commonest continued fever of the United States.

Before the fight against typhoid fever can become hopeful one barrier must be leveled: a ponderous inertia which American medical education has imposed on the medical mind in respect to one disease. Until we are relieved of the dead weight of authority, the thralldom of the text-book, we shall go on misinterpreting, in 40 per cent. of instances, the clinical phenomena of typhoid infection. While dogmatic teaching is rapidly giving way to natural methods of study, there is in the portfolio of many a professor of medicine one lecture, or a set of lectures, which will be given up with great reluctance. The subject is typhoid fever, and the vivid descriptions so impress the students that they ever after require each

case of typhoid to be as good as the description, to wear all its insignia, and to proclaim aloud its full name with decorations and titles. The prophylaxis of typhoid fever would gain an impetus from the conflagration of all such literature. Typhoid fever is taught too much; it is studied far too little. This defect of medical education has no preferred habitat within the confines of America. The glaring delinquency of Army medical men owed little to the latitudes in which it was demonstrated. These observers came from all parts of the land, and brought with them such light as their previous training and professional associations afforded. The men who entered the Army medical service in the late war were not more delinquent than those who remained in civil practice. There is a broad humor in Carroll's story of a solitary regimental surgeon who had no malaria among his fifty fever patients. He had a foreign accent, and had not acquired the American delusion that malaria is a considerable contributor to the mortality of the country.

In 1898 the Special Commission on Typhoid in the United States Army Encampments testified that no fatal malarial infections occurred to the soldiers in any part of the United States. In 1900 the profession of this country testified through the Census Bureau that for every seven persons who died of typhoid fever, three others died of malaria. In the south Mississippi belt the testimony is that twice as many deaths occurred from malaria as from typhoid. Among the twenty-one geographical divisions* of the country this one, the south Mississippi belt, showed the largest error in numbers, but a worse error was that of the central Appalachian region, where malaria is not even a considerable cause of disability, but where, nevertheless, it was charged with one death for every ten charged to typhoid.

I have plotted for each of the twenty-one grand groups the mortality returns of both typhoid and malaria by

* These Grand Groups do not respect state boundaries, but physical characteristics, as may be understood from their designations as follows:

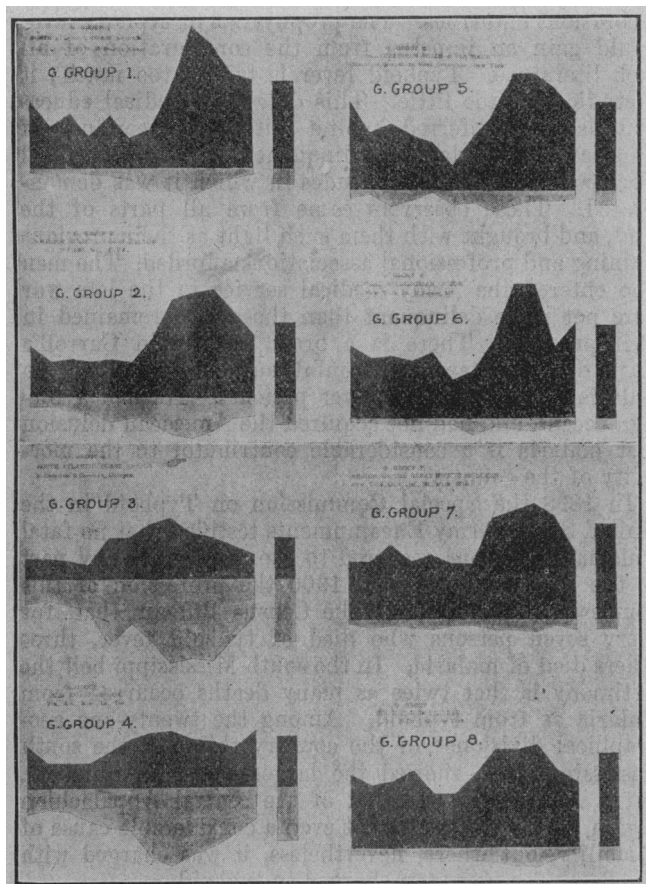
- | | |
|-----------------|-------------------------------------------|
| Grand Group 1. | North Atlantic Coast Region. |
| Grand Group 2. | Middle Atlantic Coast Region. |
| Grand Group 3. | South Atlantic Coast Region. |
| Grand Group 4. | Gulf Coast Region. |
| Grand Group 5. | Northern Hills and Plateaus. |
| Grand Group 6. | Central Appalachian Region. |
| Grand Group 7. | The Great Northern Lakes. |
| Grand Group 8. | Interior Plateau. |
| Grand Group 9. | South Central Appalachian Region. |
| Grand Group 10. | Ohio River Belt. |
| Grand Group 11. | South Interior Plateau. |
| Grand Group 12. | South Mississippi River Belt. |
| Grand Group 13. | North Mississippi River Belt. |
| Grand Group 14. | Southwest Central Region. |
| Grand Group 15. | Central Plains and Prairies. |
| Grand Group 16. | The Prairie Region. |
| Grand Group 17. | Missouri River Belt. |
| Grand Group 18. | Western Plains. |
| Grand Group 19. | Heavily Timbered Region of the Northwest. |
| Grand Group 20. | Cordilleran Region. |
| Grand Group 21. | Pacific Coast Region. |

* Read at the Fifty-fourth Annual Session of the American Medical Association, in the Section on Practice of Medicine, and approved for publication by the Executive Committee: Drs. J. M. Anders, Frank A. Jones and W. S. Thayer.

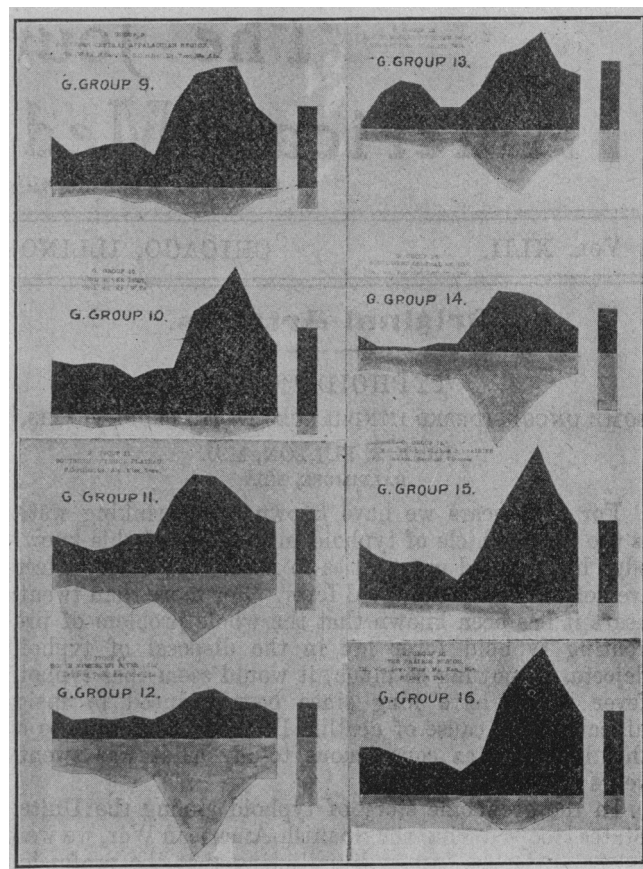
months, and the seasonal curve itself points a suspicion that confusion between the two diseases is everywhere more or less prevalent. Indeed, the charts show the malaria curve below obedient to the typhoid curve above as faithfully as the shores are reflected by the surface of a lake. The seasonal apex for the two diseases coincides in ten of the twenty-one groups, five times in August, once in September, four times in October. In eight groups the apex of the reported malaria mortality anticipates the typhoid apex by one month. In the whole Appalachian region, which runs from northern New York to within 200 miles of the Gulf coast of Alabama, the malaria is a midsummer madness, the apex being reached in July.

In the mid-Atlantic coast region, which includes parts of New York, New Jersey, Delaware, Maryland and

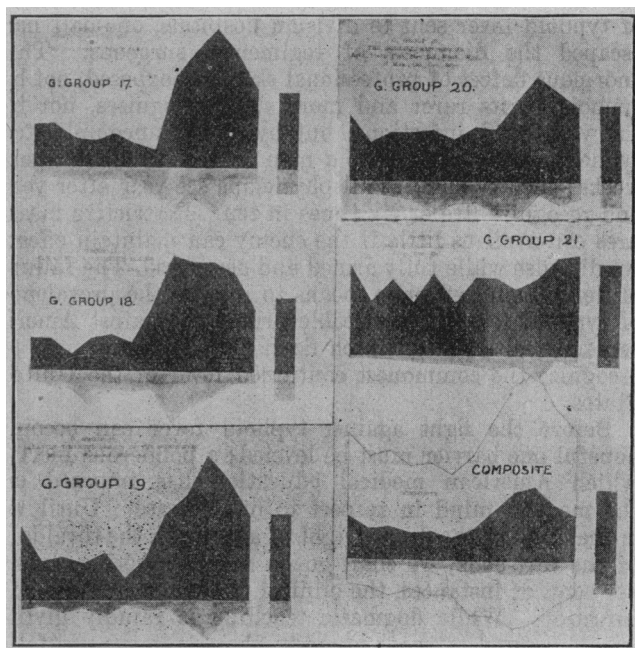
than 50 per cent. of the mortality so charged is not due to malaria. In the north a much larger part, probably two-thirds of the reputed malarial mortality, represents



Section 1 of Chart 1.



Section 2 of Chart 1.



Section 3 of Chart 1.

Chart 1 shows the reported mortality from typhoid fever and malaria in 1900 according to United States Census, by months and by Grand Groups. The black spaces indicate typhoid and the shaded spaces below indicate malaria.

unrecognized typhoid. Osler said long ago that north of the Mason-Dixon line every continued fever not yielding to quinin in six or seven days should be considered

Virginia and the whole of the District of Columbia, the Census figures show the typhoid fever and malaria mortalities in a ratio of 72 to 28. The Delaware State Board of Health recently made an extended study of the subject by modern methods, and concluded that practically all the remittent and continued malarial fevers were in fact typhoid. None of them was malarial. In Maryland, where examinations of blood for the malarial parasite have been made for four years, the parasite has been found in but 5 per cent. of all the specimens submitted. My personal belief is that fatal malarial intoxication does not happen to one citizen a year in Maryland, though malaria is in some parts of the state a considerable cause of disability.

Of all the mortality charged in the south to malaria, half, perhaps, is really due to typhoid fever. The United States Army's experience would indicate that much more than half is due in fact to typhoid, and certainly more

typhoid until definitely ascertained to be something else. I am led to believe that this mental attitude toward continued fevers is as becoming to medical men in the south as to those north of the Mason-Dixon line. Outside of certain well-known areas malaria does not kill citizens of the United States, and within those areas, where malaria is a cause of grave sickness, its right to be considered an important cause of death has not been subjected to the rigid scrutiny which its apparent importance demands. Speaking for that part of the United States which I know best, I can say that the terms "malarial" and "typhomalarial" express no definite belief as to the cause or character of a disease, but are applied to fevers of indeterminate nature, in the same way that some fourteen other titles found in the United States Census Reports are used—simply for want of a more satisfactory word.

To the large deficiency in the typhoid mortality which is fairly ascribable to the malaria delusion, one must add a further correction for the missed diagnosis of typhoid at the extremes of life. The accepted view that typhoid is unusual after middle life is not at present undergoing revision, so far as I know. But with respect to children the conviction is gradually settling in the minds of pediatricists that typhoid is common in childhood. At a recent meeting of the New York Academy of Medicine J. P. Crozer Griffith remarked on the steady change of medical opinion on this point. He said that in the Children's Hospital of Philadelphia the cases of typhoid constantly outnumber those of any other single disease, and that the superabundance of typhoid is often a cause of embarrassment in the instruction of students. New York pediatricists remarked that they seldom see typhoid fever in children, but that the children of the metropolis often suffer with an obscure fever, which, for want of a better name, a distinguished clinician called "New York" fever. This circumstance reminds one of the fever that recurred year after year in a certain American city, and which, for want of a better name, was called "Ithaca fever."

When to these sources of error in the diagnosis of typhoid fever the ambulant and the anomalous cases are added, the total default in diagnosis is seen to amount to at least 50 per cent. of cases actually occurring. So long as we deceive ourselves thus grossly as to the amount of typhoid fever prevailing, we are not in a position to profit largely by our knowledge of its prevention. But there is another important point on which, if not deceived, we are only half informed; namely, as to the preferred habitat of typhoid fever.

The belief that typhoid fever is more common in close communities, and that its incidence is heaviest on cities, has its place in the medical mind by a sort of common consent. The grounds of the belief have not been examined, if indeed they have been stated. The late Colonel George Waring said in 1878: "Typhoid is peculiarly a disease of the country rather than of the town." No similar statement, I believe, is made by any American medical author; but the opposite view, that typhoid is peculiarly a disease of cities, is expressed in the most recent editions of at least four American text-books on medicine. Typhoid fever makes its most striking demonstrations in cities, and the definite influence of sanitary works on its prevalence has made the typhoid rate the accepted index of municipal hygiene. Typhoid fever has, nevertheless, at the present time and in this country, a heavier incidence on small communities and rural districts, and probably this has been the case for a long time; for sanitary works have

neither such excellence nor so wide employment in American cities as to give urban populations in general good defenses against typhoid. On the contrary, the conditions of American cities with respect to water supply and disposal of waste might be expected to produce a constantly higher typhoid mortality than is experienced under rural conditions.

The returns of the Twelfth Census show that the typhoid mortality per 100,000 of population in the registration area was slightly higher in the rural districts than in the cities (25.5 to 25.3). The "registration area" contains, however, but one-third of the total population of the country, and comprises the populations of 341 cities of 8,000 inhabitants and upward. But a small part of the aggregate population of the registration area is, therefore, classed as rural.

When we examine the rank of typhoid fever among all

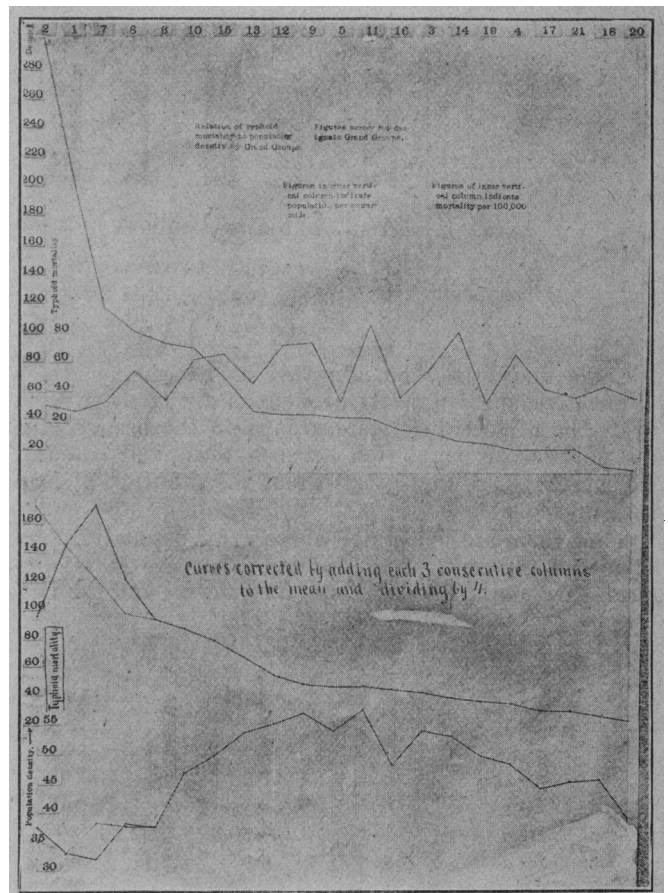


Chart 2.—Showing relation of typhoid mortality to population density. The figures across the tops indicate the Census Grand Groups in the order of their population density per square mile. The figures on the left vertical margin are the population densities. The figures in the inner left-hand column indicate the typhoid mortality.

the causes of death we find that rural typhoid fever is credited with 62 in every 1,000 deaths, as against 38 per 1,000 for urban typhoid.

Taking the 21 grand groups into which the Census office divides the country on a basis of physiography, and arranging them according to population density, one finds that the typhoid mortality rises as population density falls until we reach the low density of 50 persons per square mile. Below this point the relations of typhoid are, as might be expected, quite irregular.

The Census divides the United States into five grand divisions, which, arranged in the order of their rural population, are as follows: The south central division

having 88.9 per cent. of its total population rural, and a typhoid mortality of 79 per 100,000; south Atlantic division having a population 83 per cent. rural, and a typhoid mortality of 62 per 100,000; western division, population 68.8 per cent. rural, typhoid mortality of 33 per 100,000; north central division, population 59.4 per cent. rural, typhoid mortality of 42 per 100,000; north Atlantic division, population 41 per cent. rural, typhoid mortality of 30 per 100,000. Here we find the typhoid mortality rising as the urban population falls.

population is 50 per cent. urban, and the typhoid mortality for 1900 was 42 per 100,000.

Seven states have populations between 50 and 60 per cent. rural—New Hampshire, Ohio, Michigan, Wisconsin, Missouri, Colorado, Washington. Their population is 43 per cent. urban, and their typhoid mortality in 1900 was 38 per 100,000.

Eight states have populations between 60 and 70 per cent. urban—Maine, Indiana, Minnesota, Louisiana, Montana, Wyoming, Utah, Oregon. Their population

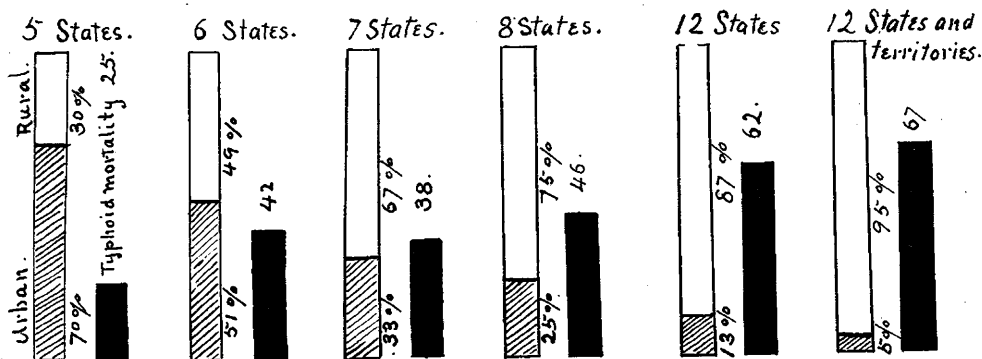


Chart 3. Showing typhoid increasing as we pass from urban to rural conditions. Rural populations indicated by white, urban by shaded areas. Black columns indicate typhoid mortality.

Some doubt may be admitted as to whether these grand divisions can fairly be compared. If the United States be divided into state groups on the basis of the distribution of population between town and country, we can eliminate to a great extent the influence of latitude and longitude.

Thus there are five states whose rural populations are under 30 per cent. of the totals. They are Massachusetts, New York, Rhode Island, New Jersey and the Dis-

is 25 per cent. urban and their typhoid mortality in 1900 was 46 per 100,000.

Twelve states have populations between 70 and 80 per cent. rural—Vermont, Virginia, South Carolina, Georgia, Florida, Tennessee, Alabama, Texas. Their population is 13 per cent. urban, and their typhoid mortality in 1900 was 62 per 100,000.

Twelve states have populations more than 80 per cent. rural—West Virginia, North Carolina, North Dakota,

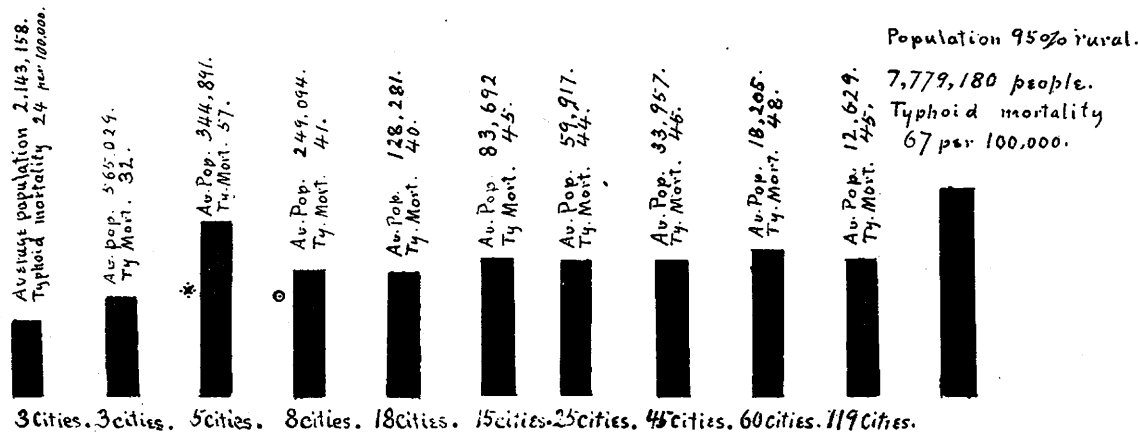


Chart 4. Typhoid in cities. Showing general inverse relation of typhoid to population.

* Includes Pittsburg with typhoid mortality 147 per 100,000.

o Includes Washington with typhoid mortality 81 per 100,000.

trict of Columbia. Their aggregate population is 12,665,183, of which number 70 per cent. are classed as urban, i. e., live in towns of 8,000 or over. Their combined typhoid mortality is 25 per 100,000. (See Table I.)

Six states have populations between 40 and 50 per cent. rural—Connecticut, Pennsylvania, Delaware, Maryland, Illinois and California. In these the total

Mississippi, Indian Territory, Oklahoma, Arkansas, New Mexico, Arizona, Nevada, Idaho. Their population is 5 per cent. urban, and their typhoid mortality in 1900 was 67 per 100,000. Taking the twenty-one grand groups into which the country is divided on a basis of physiography, and arranging them according to their population density, one finds that the typhoid mortality rises as population density decreases, until we reach a popula-

tion density of 50 persons per square mile. Below that point the relations of typhoid to population density are, as might be expected, quite irregular. (See Table II.)

The experience of Maryland supports the general indications of these figures. There is but one large city in the state. The inhabitants of Baltimore are half of the total population of the state. There are but two other towns having as many as 8,000 inhabitants. It may be fairly said that the population of the state is equally divided between rural and urban conditions. The ratio of typhoid mortality is 1 to 2.5 in favor of Baltimore, a poorly-sewered city, supplied with unfiltered water from an extensive and unprotected water-shed.

Dividing the cities of this country into ten classes on a descending population scale, we find that the typhoid mortality rises somewhat as populations diminish. Thus the least mortality in 1900 (24 per 100,000) fell on the three cities having populations of more than 1,000,000—New York, Chicago and Philadelphia. Not one of these cities is watered or sewerd in a thoroughly modern way. Indeed, one of them is notoriously bad in respect to water supply.

There are but three cities in the half-million class—Boston, Baltimore and St. Louis—whose combined mortality for 1900 was 32 per 100,000.

Next we have five cities—Cleveland, Buffalo, San Francisco, Cincinnati and Pittsburg—whose average population is 344,891, and whose combined typhoid mortality for 1900 was 57. In this group we have the banner city of the year in respect to typhoid mortality among populations of over 100,000, Pittsburg, with the large rate of 147 per 100,000. The combined mortality in this class, if Pittsburg were omitted, would be 37 per 100,000.

Next are eight cities with an average population of 249,094, and a typhoid mortality for 1900 of 41 per 100,000. The city of Washington, in this class, had a mortality of 81 per 100,000, adding 6 points to the combined mortality of the class.

In the next class are eighteen cities whose average population is 128,281, and whose typhoid mortality in 1900 was 40 per 100,000. The second city of the country in typhoid mortality among populations of over 100,000 is in this class, Allegheny, Pa.

In the next class are fifteen cities with populations averaging 83,692, and typhoid mortality for 1900 was 45 per 100,000.

Twenty-five cities whose populations averaged 59,517 had a typhoid mortality in 1900 of 44 per 100,000. The heaviest individual rate of the year in populations over 50,000 fell in this class on Savannah; 107 deaths among her 54,000 citizens, a rate of 197 per 100,000.

In the next class are sixty cities having an average population of 18,205, whose combined typhoid mortality for 1900 was 48 per 100,000.

Finally there are 119 cities whose populations average 12,629, and whose combined typhoid mortality for the year was 45 per 100,000.

Of twenty-four towns having typhoid mortality rates above 100, the tenth class furnishes eleven in the states of Connecticut, Iowa, Indiana, Louisiana, Wisconsin, Michigan, Kansas and Illinois. (See Table IV.)

The ninth class furnishes five towns, in Kentucky one, in New York two, in Mississippi one, in Ohio one.

The eighth class furnishes four towns, in Pennsylvania two, in Ohio one and in Colorado one.

The seventh class furnishes two towns, one in South Carolina and one in Georgia.

The sixth class furnishes one city, Atlanta, Ga., eighteenth in order of typhoid rate descending.

The third class furnishes one city, Pittsburg, Pa., sixth in rank of typhoid mortality descending.

The states contributing the eight highest urban rates are, in order, Georgia, Louisiana, Connecticut, Kentucky, Iowa, Pennsylvania, New York. Pennsylvania has two cities in this list.

In the list of cities showing rates above 100, Ohio has three towns; Pennsylvania, two; Connecticut, two; Iowa, two; Illinois, two; Georgia, two; New York, two; Louisiana, one; South Carolina, one; Kentucky, one; Indiana, one; Wisconsin, one; Kansas, one; Mississippi, one; Colorado, one; Michigan, one. (See Tables III and IV.)

The total population accounted for in this analysis of typhoid mortality is 20,922,886. The actual increase of typhoid mortality as the scale of population falls is probably greater than these tables indicate, for the states whose general mortality from typhoid is comparatively low are the chief contributors to the ninth and tenth classes, whose rates are highest.

The foregoing studies seem to warrant two conclusions, each having an important bearing on the general prophylaxis of typhoid fever. The first and more important is that the typhoid mortality reported in this country is not more (probably less) than 65 per cent. of the typhoid mortality actually occurring. Of the total morbidity from the disease a considerable part runs its course to recovery without coming under medical observation, and of the cases receiving professional care fully one-half are not recognized as typhoid fever. It therefore follows that the first step in the restriction of typhoid fever must fail for lack of diagnostic skill in the rank and file of the medical profession. The correction of this delinquency does not wait on improved methods of clinical or laboratory diagnosis, but on a general realization of the ubiquity and perennial activity of typhoid fever, and on the lumbering advance of reform in medical education.

A subsidiary conclusion from this part of the present study is that a very large majority of the deaths attributed to malaria are due to causes in which malaria does not even participate.

The second important conclusion, drawn from a study of the distribution of typhoid mortality, is that the infection is more heavily seeded in smaller communities, and that the propagation of the disease is in general from the country to the town, rather than from town to country. The explanation of this fact is probably found in the greater care given to the disposal of human excrement as communities grow more populous.

The prophylaxis of typhoid fever consists essentially in defense against excremental contamination, and precisely as the barriers are more or less remote from the sources of infection is the defense less or more effective. In this view of the prevention of typhoid fever it must appear that, notwithstanding the very great value of the defenses on which cities most rely, these defenses do not, and by their widest conceivable extension can not, satisfy the requirements of a rational prophylaxis of typhoid fever. In town and country alike the appointed time and place for intervention against the spread of typhoid fever is whenever and wherever a case of typhoid fever is recognized. Those outbreaks of typhoid which from time to time scandalize great cities and bring down wrath on the authorities are, as a rule, less important than, and may be part of, unremarked, unopposed, or perhaps lie-coddled epidemics covering the countryside

for miles around. To set up at the city gates expensive works for the purification of the public water supply as a main defense against water-borne disease is literally a preposterous arrangement. It waives the choice of time, place and weapons, conceding all these advantages to the enemy. It assumes that the vices of rural insanitation are invincible, but they are not. If there is one direction in which, more than another, the political influence of great cities should be exerted, it is to bring rural districts and small communities under legal obligation to render strict account of deaths and the causes of death, and to take and give good heed to the preventable diseases at the time and place of their occurrence.

TABLE I.

FIVE STATES WHOSE URBAN POPULATIONS ARE 60 PER CENT. AND UPWARDS.

| | Population. | Urban. | Typhoid. |
|----------------------|-------------|-----------|----------|
| Massachusetts | 2,805,346 | 2,132,623 | 625 |
| Rhode Island | 428,556 | 347,892 | 102 |
| New York | 7,268,894 | 4,980,042 | 1,776 |
| New Jersey | 1,883,669 | 1,153,001 | 398 |
| District of Columbia | 278,718 | 278,718 | 225 |
| | 12,665,183 | 8,892,276 | 3,126 |

Rural population, 30 per cent. Typhoid per 100,000, 25.

SIX STATES WHOSE URBAN POPULATIONS ARE BETWEEN 40 AND 60 PER CENT.

| | Population. | Urban. | Typhoid. |
|--------------|-------------|-----------|----------|
| Connecticut | 908,420 | 483,068 | 249 |
| Pennsylvania | 6,302,115 | 2,865,937 | 2,779 |
| Delaware | 184,735 | 76,508 | 90 |
| Maryland | 1,188,044 | 557,407 | 510 |
| Illinois | 4,821,550 | 2,271,940 | 1,897 |
| California | 1,485,053 | 649,474 | 542 |
| | 14,889,917 | 7,593,424 | 6,067 |

Rural population, 49 per cent. Typhoid per 100,000, 42.

SEVEN STATES WHOSE POPULATIONS ARE FROM 30 TO 40 PER CENT. URBAN.

| | Population. | Urban. | Typhoid. |
|---------------|-------------|-----------|----------|
| New Hampshire | 411,588 | 158,920 | 69 |
| Ohio | 4,157,545 | 1,599,840 | 1,795 |
| Michigan | 2,420,982 | 747,334 | 680 |
| Wisconsin | 2,069,042 | 634,437 | 365 |
| Missouri | 3,106,665 | 955,563 | 1,790 |
| Colorado | 539,700 | 205,703 | 222 |
| Washington | 518,103 | 165,282 | 171 |
| | 13,223,625 | 4,467,079 | 5,092 |

Rural population, 67 per cent. Typhoid per 100,000, 38.

EIGHT STATES WITH POPULATIONS 20 TO 30 PER CENT. URBAN.

| | Population. | Urban. | Typhoid. |
|-----------|-------------|-----------|----------|
| Maine | 694,466 | 164,639 | 200 |
| Indiana | 2,516,462 | 607,834 | 1,496 |
| Minnesota | 1,751,394 | 470,046 | 386 |
| Louisiana | 1,381,625 | 314,386 | 1,077 |
| Montana | 243,329 | 65,623 | 42 |
| Wyoming | 92,531 | 22,294 | 16 |
| Utah | 276,749 | 69,844 | 73 |
| Oregon | 413,536 | 98,807 | 106 |
| | 73,700,092 | 1,813,473 | 3,396 |

Rural population, 75 per cent. Typhoid per 100,000, 46.

TWELVE STATES WITH POPULATIONS FROM 10 TO 20 PER CENT. URBAN.

| | Population. | Urban. | Typhoid. |
|----------------|-------------|------------|----------|
| Vermont | 343,641 | 305,054 | 107 |
| Virginia | 1,854,184 | 1,582,489 | 914 |
| South Carolina | 1,340,316 | 1,240,146 | 970 |
| Georgia | 2,216,331 | 1,972,562 | 1,585 |
| Florida | 528,542 | 449,413 | 290 |
| Iowa | 2,231,853 | 1,857,128 | 549 |
| Nebraska | 1,066,300 | 897,575 | 260 |
| Kansas | 1,470,495 | 1,265,288 | 688 |
| Kentucky | 2,147,174 | 1,784,115 | 1,669 |
| Tennessee | 2,020,216 | 1,750,298 | 1,709 |
| Alabama | 1,828,697 | 1,694,991 | 1,713 |
| Texas | 3,048,710 | 2,704,848 | 2,014 |
| | 20,096,459 | 17,503,907 | 12,468 |

Rural population, 87 per cent. Typhoid per 100,000, 62.

TWELVE STATES AND TERRITORIES HAVING POPULATIONS LESS THAN 10 PER CENT. URBAN.

| | Population. | Urban. | Typhoid. |
|------------------|-------------|-----------|----------|
| West Virginia | 958,800 | 885,197 | 586 |
| North Carolina | 1,893,810 | 1,797,273 | 1,250 |
| North Dakota | 319,146 | 309,548 | 65 |
| South Dakota | 401,750 | 391,484 | 73 |
| Mississippi | 1,581,270 | 1,510,176 | 1,370 |
| Indian Territory | 392,060 | 392,060 | 321 |
| Oklahoma | 398,331 | 378,288 | 201 |
| Arkansas | 1,311,564 | 1,240,201 | 1,172 |
| New Mexico | 195,310 | 195,310 | 102 |
| Arizona | 122,931 | 122,931 | 41 |
| Nevada | 42,335 | 42,335 | 12 |
| Idaho | 161,772 | 161,772 | 37 |
| | 7,779,179 | 7,426,575 | 5,230 |

Rural population, 95 per cent. Typhoid per 100,000, 67.

TABLE II.

THE 21 GRAND GROUPS, ACCORDING TO THE TWELFTH CENSUS, SHOWING POPULATIONS, TYPHOID-MALARIA VARIETIES, WITH DENSITIES AND TYPHOID RATES.

| Grand Group. | Typhoid Deaths. | Malaria Deaths. | Population. | Dens. City. | Typhoid Mor'y. |
|--------------|-----------------|-----------------|-------------|-------------|----------------|
| 1. | 868 | 157 | 3,824,576 | 198.4 | 23 |
| 2. | 1,900 | 694 | 7,139,889 | 299.8 | 27 |
| 3. | 625 | 922 | 1,193,697 | 29.0 | 52 |
| 4. | 1,111 | 1,179 | 1,767,487 | 16.5 | 63 |
| 5. | 604 | 94 | 2,063,453 | 38.1 | 29 |
| 6. | 991 | 108 | 3,249,040 | 89.0 | 30 |
| 7. | 1,701 | 193 | 5,910,100 | 114.0 | 29 |
| 8. | 3,796 | 557 | 7,488,008 | 99.4 | 51 |
| 9. | 2,886 | 695 | 4,031,150 | 39.0 | 70 |
| 10. | 1,774 | 309 | 3,018,359 | 85.7 | 58 |
| 11. | 3,971 | 2,285 | 4,812,414 | 37.7 | 83 |
| 12. | 753 | 1,424 | 1,090,623 | 39.0 | 69 |
| 13. | 1,198 | 571 | 2,872,624 | 42.2 | 42 |
| 14. | 4,319 | 3,597 | 5,424,490 | 21.9 | 79 |
| 15. | 3,410 | 695 | 5,458,379 | 65.0 | 62 |
| 16. | 2,645 | 641 | 8,133,937 | 30.6 | 33 |
| 17. | 587 | 169 | 1,446,643 | 16.5 | 37 |
| 18. | 530 | 199 | 1,442,684 | 3.4 | 40 |
| 19. | 543 | 101 | 1,900,622 | 20.3 | 28 |
| 20. | 638 | 220 | 1,965,065 | 2.2 | 33 |
| 21. | 529 | 64 | 1,671,335 | 16.0 | 32 |

TABLE III.

Three hundred and one American cities classified on a descending scale of populations; showing typhoid mortality according to U. S. Census figures for each of ten classes.

CLASS I.

| | Population. | Deaths from Typhoid. |
|--------------|-------------|----------------------|
| Chicago | 1,698,575 | 470 |
| New York | 3,437,202 | 594 |
| Philadelphia | 1,293,697 | 489 |
| Totals | 6,429,474 | 1,553 |

Average population, 2,143,158. Typhoid mortality per 100,000, 24.

CLASS II.

| | Population. | Deaths from Typhoid. |
|-----------|-------------|----------------------|
| Boston | 560,892 | 153 |
| Baltimore | 508,957 | 177 |
| St. Louis | 575,238 | 190 |
| Totals | 1,695,087 | 520 |

Average population, 565,029. Typhoid mortality per 100,000, 32.

CLASS III.

| | Population. | Deaths from Typhoid. |
|---------------|-------------|----------------------|
| Cleveland | 381,768 | 184 |
| Buffalo | 352,387 | 88 |
| San Francisco | 342,782 | 135 |
| Cincinnati | 325,902 | 106 |
| Pittsburg * | 321,616 | 474 |
| Totals | 1,724,455 | 987 |

Average population, 344,891. Typhoid mortality per 100,000, 57.

* Pittsburg being omitted, the typhoid mortality of the group is 37 per 100,000.

CLASS IV.—EIGHT CITIES.

| | Population. | Deaths from Typhoid. |
|-------------------|-------------|----------------------|
| New Orleans | 287,104 | 191 |
| Detroit | 285,704 | 54 |
| Milwaukee | 285,315 | 52 |
| Washington, D. C. | 278,718 | 225 |
| Newark, N. J. | 266,070 | 26 |
| Jersey City | 206,433 | 46 |
| Louisville, Ky. | 204,731 | 150 |
| Minneapolis | 202,718 | 83 |
| Totals | 1,996,793 | 827 |

Average population, 249,094. Typhoid mortality per 100,000, 41.

* Washington being omitted, the typhoid mortality of the group is 35 per 100,000.

CLASS V.—EIGHTEEN CITIES.

| | Population. | Deaths from Typhoid. |
|------------------|-------------|----------------------|
| Providence | 174,597 | 52 |
| Indianapolis | 169,164 | 77 |
| Kansas City | 163,752 | 125 |
| Rochester | 162,608 | 38 |
| St. Paul | 162,065 | 36 |
| Denver | 133,859 | 57 |
| Toledo | 131,822 | 53 |
| Allegheny, Pa. | 129,896 | 134 |
| Columbus, Ohio | 125,560 | 68 |
| Worcester, Mass. | 118,421 | 21 |
| Syracuse, N. Y. | 108,374 | 25 |
| Fall River | 104,863 | 23 |
| Los Angeles | 102,320 | 51 |
| New Haven | 108,027 | 33 |
| Paterson, N. J. | 105,171 | 31 |
| St. Joseph, Mo. | 102,979 | 37 |
| Scranton | 102,026 | 30 |
| Omaha | 102,555 | 41 |
| Totals | 2,309,059 | 932 |

Average population, 128,281. Typhoid per 100,000, 40.

CLASS VI.—FIFTEEN CITIES.

| | Population. | Deaths from Typhoid. |
|---------------|-------------|----------------------|
| Albany | 91,151 | 41 |
| Richmond, Va. | 85,050 | 66 |

| | | Deaths | | | Deaths |
|------------------------------------------------------|-----------|---------------|-----------------------------|--------|---------------|
| | | from Typhoid. | | | from Typhoid. |
| Population. | | | Population. | | |
| Dayton, Ohio..... | 85,333 | 45 | Norristown, Pa..... | 22,265 | 9 |
| Seattle..... | 80,671 | 31 | Jamestown, N. Y..... | 22,892 | 16 |
| Atlanta, Ga..... | 89,872 | 98 | Muncie, Ind..... | 20,942 | 10 |
| Lowell, Mass..... | 94,969 | 18 | Burlington, Iowa..... | 23,201 | 14 |
| Cambridge, Mass..... | 91,886 | 19 | Wilmington, N. C..... | 20,976 | 10 |
| Portland, Ore..... | 90,426 | 22 | Leavenworth, Kan..... | 20,735 | 8 |
| Grand Rapids, Mich..... | 87,565 | 34 | Wichita, Kan..... | 24,671 | 17 |
| Hartford, Conn..... | 79,850 | 45 | New Brunswick, N. J..... | 20,006 | 4 |
| Reading, Pa..... | 78,961 | 35 | Jackson, Mich..... | 25,180 | 16 |
| Wilmington, Del..... | 76,508 | 50 | Kalamazoo, Mich..... | 24,404 | 7 |
| Camden, N. J..... | 75,935 | 22 | Muskegon, Mich..... | 20,818 | 4 |
| Trenton, N. J..... | 73,307 | 25 | Bangor, Me..... | 21,850 | 13 |
| Bridgeport, Conn..... | 70,996 | 11 | Petersburg, Va..... | 21,810 | 35 |
| Totals..... | 1,255,385 | 562 | Cohoes, N. Y..... | 23,910 | 18 |
| Average population, 83,692. Typhoid per 100,000, 45. | | | Watertown, N. Y..... | 21,696 | 6 |
| CLASS VII.—TWENTY-FIVE CITIES. | | | Lafayette, Ind..... | 18,116 | 10 |
| Total population..... | 1,389,462 | | Richmond, Ind..... | 18,226 | 18 |
| Average population..... | 55,578 | | Ottumwa, Iowa..... | 18,197 | 6 |
| Total typhoid deaths..... | 625 | | Northampton, Mass..... | 18,643 | 9 |
| Typhoid mortality per 100,000..... | 45 | | Chicopee, Mass..... | 19,167 | 7 |
| | | | Medford, Mass..... | 18,244 | 17 |
| | | | Lynchburg, Va..... | 18,891 | 7 |
| | | | Key West, Fla..... | 17,114 | 31 |
| | | | Paducah, Ky..... | 19,446 | 8 |
| | | | Lebanon, Pa..... | 17,628 | 5 |
| | | | Eau Claire, Wis..... | 17,517 | 7 |
| | | | Battle Creek, Mich..... | 18,563 | 7 |
| | | | Port Huron, Mich..... | 19,158 | 2 |
| | | | Concord, N. H..... | 19,632 | 24 |
| | | | Niagara, N. Y..... | 19,457 | 19 |
| | | | Findlay, Ohio..... | 17,613 | 9 |
| | | | Portsmouth, Ohio..... | 17,870 | 1 |
| | | | Sault Ste. Marie, Mich..... | 19,158 | 27 |
| | | | Natchez, Miss..... | 23,898 | 5 |
| | | | Orange, N. J..... | 24,141 | 2 |
| | | | Parth Amboy, N. J..... | 17,699 | 5 |
| | | | Kingston, N. Y..... | 24,535 | 10 |
| | | | Newburgh, N. Y..... | 24,943 | 3 |
| | | | Amsterdam, N. Y..... | 20,929 | 3 |
| | | | Gloversville, N. Y..... | 18,319 | 7 |
| | | | Poughkeepsie, N. Y..... | 24,029 | 4 |
| | | | Hamilton, Ohio..... | 23,914 | 8 |
| | | | Lima, Ohio..... | 21,723 | 5 |
| | | | Newark, Ohio..... | 18,157 | 2 |
| | | | Central Falls, R. I..... | 18,167 | 12 |
| | | | Newport, R. I..... | 22,034 | 4 |
| | | | Burlington, Vt..... | 18,640 | 4 |
| | | | San Diego, Cal..... | 17,700 | 5 |
| | | | Meriden, Conn..... | 24,296 | 3 |
| | | | New London, Conn..... | 17,548 | 1 |
| | | | Norwich, Conn..... | 17,251 | 14 |
| | | | Belleville, Ill..... | 17,484 | 10 |
| | | | Aurora, Ill..... | 24,147 | 8 |
| | | | Decatur, Ill..... | 20,754 | 4 |
| | | | Galesburg, Ill..... | 18,607 | 6 |
| | | | Everett, Mass..... | 24,336 | 5 |
| | | | Winona, Minn..... | 19,714 | 3 |
| | | | Madison, Wis..... | 19,164 | 6 |
| | | | Green Bay, Wis..... | 18,684 | 1 |
| | | | Nashua, N. H..... | 28,898 | |
| Totals..... | 1,092,281 | 521 | | | |
| CLASS X.—ONE HUNDRED AND NINETEEN CITIES. | | | | | |
| Total population..... | 1,502,829 | | | | |
| Average population..... | 12,629 | | | | |
| Total typhoid..... | 674 | | | | |
| Typhoid per 100,000..... | 45 | | | | |
| | | Deaths | | | Deaths |
| | | from Typhoid. | | | from Typhoid. |
| Population. | | | Population. | | |
| Haverhill, Mass..... | 37,175 | 4 | Lockport, N. Y..... | 16,581 | 3 |
| McKeesport, Pa..... | 34,227 | 15 | Shreveport, La..... | 16,013 | 30 |
| Altoona, Pa..... | 38,973 | 19 | Marquette, Wis..... | 16,195 | 19 |
| Spokane, Wash..... | 36,848 | 19 | Appleton, Wis..... | 15,085 | 3 |
| Davenport, Iowa..... | 35,254 | 23 | Lansing, Mich..... | 16,485 | 4 |
| Sioux City, Iowa..... | 33,111 | 13 | Biddeford, Me..... | 16,145 | 13 |
| Johnstown, Pa..... | 35,936 | 35 | Alameda, Cal..... | 16,464 | 5 |
| Elmira, N. Y..... | 35,672 | 13 | Rome, N. Y..... | 15,343 | 6 |
| Chelsea, Mass..... | 34,072 | 8 | Helena, Mont..... | 10,770 | 4 |
| Springfield, Ill..... | 34,159 | 19 | Meadville, Pa..... | 10,291 | 10 |
| Bayonne, N. J..... | 32,722 | 5 | Carbondale, Pa..... | 12,316 | 5 |
| Superior, Wis..... | 31,091 | 19 | Columbia, Pa..... | 13,696 | 5 |
| Allentown, Pa..... | 35,416 | 7 | South Bethlehem, Pa..... | 13,241 | 6 |
| Salem, Mass..... | 35,956 | 51 | Oil City, Pa..... | 13,264 | 11 |
| Youngstown, Ohio..... | 44,885 | 16 | Rutland, Vt..... | 11,499 | 4 |
| Brockton, Mass..... | 40,063 | 13 | Harrisontown, N. J..... | 10,596 | 3 |
| Binghamton, N. Y..... | 39,647 | 13 | Millville, N. J..... | 10,583 | 5 |
| Lancaster, Pa..... | 41,459 | 23 | Montclair, N. J..... | 13,962 | 1 |
| Covington, Ky..... | 42,938 | 17 | Phillipsburg, N. J..... | 10,052 | 2 |
| Mobile, Ala..... | 38,469 | 31 | Ithaca, N. Y..... | 13,000 | 4 |
| Wheeling, W. Va..... | 38,878 | 26 | Flint, Mich..... | 18,103 | 5 |
| Lincoln, Neb..... | 40,169 | 14 | Ann Arbor, Mich..... | 14,509 | 8 |
| Terre Haute, Ind..... | 36,673 | 22 | Marquette, Mich..... | 10,058 | 3 |
| Saginaw, Mich..... | 42,345 | 17 | Menominee, Mich..... | 12,818 | 15 |
| Tacoma, Wash..... | 37,714 | 7 | West Bay City, Mich..... | 13,119 | 6 |
| Fitchburg, Mass..... | 31,531 | 6 | Dover, N. H..... | 13,207 | 3 |
| Malden, Mass..... | 33,664 | 13 | Portsmouth, N. H..... | 10,637 | 1 |
| Newton, Mass..... | 33,587 | 7 | Augusta, Me..... | 11,683 | 5 |
| Taunton, Mass..... | 31,036 | 3 | Fresno, Cal..... | 12,470 | 3 |
| Auburn, N. Y..... | 30,345 | 12 | Bridgeton, N. J..... | 13,913 | 5 |
| Schenectady, N. Y..... | 31,683 | 10 | Morristown, N. J..... | 11,267 | 3 |
| Canton, Ohio..... | 30,667 | 19 | Watervliet, N. Y..... | 14,321 | 12 |
| Pawtucket, R. I..... | 39,231 | 7 | Dunkirk, N. Y..... | 11,616 | 6 |
| Quincy, Mass..... | 36,252 | 8 | Geneva, N. Y..... | 10,433 | 5 |
| Sacramento, Cal..... | 29,282 | 1 | Lansingburg, N. Y..... | 12,595 | 8 |
| Woonsocket, R. I..... | 28,204 | 6 | Ogdensburg, N. Y..... | 12,633 | 11 |
| New Castle, Pa..... | 28,339 | 42 | Saratoga, N. Y..... | 12,409 | 6 |
| Jacksonville, Fla..... | 28,429 | 19 | Ashtabula, Ohio..... | 12,949 | 9 |
| Easton, Pa..... | 25,238 | 4 | Chillicothe, Ohio..... | 12,976 | 4 |
| Newport, Ky..... | 28,301 | 15 | Tiffin, Ohio..... | 10,989 | |
| Pueblo, Colo..... | 28,157 | 31 | | | |
| Passaic, N. J..... | 27,777 | 10 | | | |
| Williamsport, Pa..... | 28,757 | 11 | | | |
| Bay City, Mich..... | 27,628 | 8 | | | |
| Gloucester, Mass..... | 26,121 | 4 | | | |
| Totals..... | 1,528,061 | 689 | | | |
| CLASS IX.—SIXTY CITIES. | | | | | |
| Total population..... | 1,092,281 | | | | |
| Average population..... | 18,205 | | | | |
| Total typhoid..... | 521 | | | | |
| Typhoid per 100,000..... | 48 | | | | |

DISCUSSION.

DR. J. H. MUSSER, Philadelphia—It is fortunate that we can make an early, or more precise, diagnosis by modern bacteriologic methods, such as the employment of the serum test, or by culture methods; by such means we can make such precise diagnoses that there can hardly be any mistakes made regarding the nature of the prevailing fever or epidemic. There is no excuse, therefore, except probably in some communities or districts, for not making an early diagnosis. Unfortunately, however, there is a lack, apparently, of conscience in physicians. They are not awake to the dangers of the infection in cases of typhoid fever. Not long ago, within the last three years, I saw three cases of typhoid fever in one family in the country that had their origin as follows: The original case was an imported one. This man became infected in a near town and came to the country home of the physician, who was very careless regarding the disposal of the excreta. The relation of the privy was such that its contents drained into a driven well. This, of course, was the source of infection in the members of the family. One member of this family died and two were placed in great peril. These people were taken ill and all were sick, including the physician, due to the carelessness, or lack of conscience, on the part of the physician regarding the disposal of the excreta. There was a lack of regard for the protection of the people in that district. I could tell of many local epidemics arising through the faults of physicians. It is, therefore, necessary to take a lesson to ourselves before we preach to communities. Communities should be educated in regard to this. Above all, the civil authorities should be brought to realize their responsibilities. In cities where there are piles of dirt, etc., a policeman goes and places a red lantern at each pile to indicate danger; yet no civic authorities would place a red light danger signal in places where there were epidemics or possibilities of typhoid fever. Why is this done in the first instance? Because the city knows that if an accident should happen the authorities would be held responsible. If we should hold the civic authorities similarly responsible in cases of typhoid fever we could soon get control of the disease. How can we help ourselves regarding this? It is a difficult problem and a difficult question to answer.

It has been said that the busy practitioner has not time to act as police and see that his people carry out his directions regarding the disposal of excreta, etc. We should see developed a conscientious sense of duty which should inspire the untiring effort of all to protect communities as well as individuals. Each practitioner in a community should have a trained assistant. Let him take a man, for instance, from the Johns Hopkins Hospital Laboratory to assist him in laboratory work; any good practitioner can afford this. I am satisfied that any practitioner of medicine who takes an assistant to do work of this character, and so shows the community that he is practicing the highest type of medicine and making every effort to protect the community, will increase his income to twice what it would have been without an assistant in charge. If, however, that does not seem to be practical, then a group of physicians should have an assistant to make diagnoses and watch the excreta and to determine whether a typhoid fever patient should be sent forth in a community with safety by examining the urine, etc. If this is not practical, then we should resort to government control. We must educate the civic government itself regarding the danger of typhoid fever patients, and make them understand that they should be under their charge. The physician should continue to treat the patient, but the civic authorities should be held responsible for him until he is perfectly harmless. The patient should not be allowed away from a community. All the excreta and discharges should be taken care of. Then, too, perhaps, the government should be held responsible for the laboratory diagnosis and also for the sanitary management of the case, absolutely from the start of the infection. I do not think this is an unreasonable thing to expect. When we realize the trouble the government is taking with some infections, when we realize the mass of money that is spent to prevent the spread of yel-

| | Population. | Deaths from Typhoid. |
|--------------------------|-------------|-------------------------|
| Massillon, Ohio..... | 11,444 | 5 |
| Marietta, Ohio..... | 13,000 | 8 |
| Lawrence, Kan..... | 10,862 | 4 |
| Phoenixville, Pa..... | 9,196 | 4 |
| Bennington, Vt..... | 8,556 | 2 |
| Barre, Vt..... | 8,448 | 3 |
| Owosso, Mich..... | 8,636 | 4 |
| Pontiac, Mich..... | 9,769 | 1 |
| Escanaba, Mich..... | 9,549 | 9 |
| Iron Mountain, Mich..... | 9,242 | 1 |
| Ironwood, Mich..... | 9,705 | 4 |
| Traverse City, Mich..... | 9,407 | 3 |
| Berlin, N. H..... | 8,886 | 3 |
| Laconia, N. H..... | 8,042 | 2 |
| Rochester, N. H..... | 8,466 | 0 |
| Keene, N. H..... | 9,165 | 0 |
| Rockland, Me..... | 8,150 | 1 |
| Hutchinson, Kan..... | 9,379 | 11 |
| Carlisle, Pa..... | 9,626 | 5 |
| Plymouth, Pa..... | 13,649 | 7 |
| Glen Falls, N. Y..... | 12,613 | 5 |
| Jeffersonville, Ind..... | 10,774 | 10 |
| Columbus, Ind..... | 8,130 | 3 |
| Peru, Ind..... | 8,463 | 10 |
| Vincennes, Ind..... | 10,249 | 8 |
| Keokuk, Iowa..... | 14,641 | 15 |
| Muscatine, Iowa..... | 14,073 | 13 |
| Marshalltown, Iowa..... | 11,544 | 18 |
| Oskaloosa, Iowa..... | 9,212 | 4 |
| Leadville, Colo..... | 12,455 | 6 |
| Raleigh, N. C..... | 13,643 | 6 |
| Newburyport, Mass..... | 14,478 | 4 |
| Weymouth, Mass..... | 11,324 | 1 |
| Marlboro, Mass..... | 13,609 | 1 |
| Alexandria, Va..... | 14,528 | 11 |
| Annapolis, Md..... | 8,525 | 2 |
| Frederick, Md..... | 9,296 | 4 |
| Hudson, N. Y..... | 9,528 | 5 |
| Cortland, N. Y..... | 9,014 | 5 |
| Bellaire, Ohio..... | 9,912 | 7 |
| Middletown, Ohio..... | 9,215 | 1 |
| Warren, Ohio..... | 8,529 | 6 |
| Plainfield, N. J..... | 15,369 | 2 |
| Middletown, N. Y..... | 14,522 | 3 |
| Port Jervis, N. Y..... | 9,385 | 3 |
| Peekskill, N. Y..... | 10,358 | 0 |
| Corning, N. Y..... | 11,061 | 5 |
| Johnstown, N. Y..... | 10,130 | 3 |
| Olean, N. Y..... | 9,462 | 3 |
| Ironton, Ohio..... | 11,868 | 12 |
| DuBois, Pa..... | 9,375 | 4 |
| Hazletown, Pa..... | 14,230 | 3 |
| Mahanoy, Pa..... | 13,504 | 3 |
| Mt. Carmel, Pa..... | 13,179 | 2 |
| Pittston, Pa..... | 12,566 | 2 |
| Pottsville, Pa..... | 15,710 | 3 |
| Steelton, Pa..... | 12,086 | 3 |
| Ansonia, Conn..... | 2,681 | 2 |
| Danbury, Conn..... | 16,537 | 3 |
| Greenwich, Conn..... | 2,420 | 3 |
| Middletown, Conn..... | 9,589 | 5 |
| Naugantuck, Conn..... | 10,541 | 5 |
| Norwalk, Conn..... | 6,125 | 2 |
| Stamford, Conn..... | 15,997 | 1 |
| Stonington, Conn..... | 2,278 | 1 |
| Woolingford, Conn..... | 6,737 | 3 |
| Bristol, Conn..... | 6,268 | 11 |
| Tarrington, Conn..... | 8,360 | 2 |
| Danville, Ill..... | 16,354 | 17 |
| Jacksonville, Ill..... | 15,078 | 10 |
| Ottawa, Ill..... | 10,588 | 3 |
| Michigan City, Ind..... | 14,850 | 3 |
| Beverly, Mass..... | 13,884 | 4 |
| Melrose, Mass..... | 12,962 | 6 |
| Mankato, Minn..... | 10,599 | 3 |
| Chippewa Falls, Wis..... | 8,094 | 0 |
| Beloit, Wis..... | 10,436 | 0 |
| Manitowoc, Wis..... | 11,786 | 3 |
| Totals | 1,502,829 | 674 |

TABLE IV.

THE 24 CITIES HAVING TYPHOID MORTALITY RATES OF ABOVE 100 PER 100,000 IN THE DESCENDING ORDER.

| | Population Class. | Typhoid Mortality per 100,000. |
|-------------------------|----------------------|-----------------------------------|
| Savannah..... | 7 | 197 |
| Shreveport..... | 10 | 187 |
| Bristol, Conn..... | 10 | 175 |
| Paducah, Ky..... | 9 | 159 |
| Marshalltown, Iowa..... | 10 | 156 |
| Newcastle, Pa..... | 8 | 147 |
| Pittsburg, Pa..... | 3 | 147 |
| Cohoes, N. Y..... | 9 | 146 |
| Charleston, S. C..... | 7 | 125 |
| Greenwich, Conn..... | 10 | 124 |
| Niagara, N. Y..... | 9 | 123 |
| Peru, Ind..... | 10 | 118 |
| Marquette, Wis..... | 10 | 117 |
| Menominee, Mich..... | 10 | 117 |
| Hutchinson, Kan..... | 10 | 117 |
| Youngstown, Ohio..... | 8 | 114 |
| Natchez, Miss..... | 9 | 113 |
| Pueblo, Colo..... | 8 | 110 |
| Atlanta, Ga..... | 9 | 109 |
| Findlay, Ohio..... | 6 | 108 |
| Allegheny, Pa..... | 7 | 106 |
| Danville, Ill..... | 10 | 104 |
| Keokuk, Iowa..... | 10 | 102 |
| Ironton, Ohio..... | 10 | 101 |

low fever or the plague, when we think of how many more lives are lost through the ravages of typhoid fever, and when we think that our hands are practically paralyzed in our attempts to obtain governmental control of these cases, we must marvel at it. They should look after typhoid epidemics as they do after other epidemics.

I had hoped to learn a ready method for disinfecting the urine. Disinfection of the urine is very essential before the patients get from out of our control. Probably we can make the urine sterile by the use of urotropin. In the later stages of the disease and throughout the period of convalescence and until a trained assistant or a government expert shows the urine is free from bacilli these patients should not be lost sight of. The use of urotropin is one of the best methods for preventing as well as curing a complication of typhoid fever, i. e., cystitis; sterilizing the urine is the best aid in the way of prophylaxis.

DR. DELANCEY ROCHESTER, Buffalo—Milk may be infected after leaving the farm, and the source of infection be difficult to trace. In Buffalo, in one of the healthiest districts, ten years ago, four members of the same family were taken ill with typhoid fever within four days of each other, and there was apparently no local reason for it. In looking for the source of the disease the milk supply was investigated. At the farm from which the milk came there was no typhoid. The milk was followed to the city, and the source of infection was found to be at the home of the man who delivered the milk. In his home was a case of typhoid fever; after he received the milk from the farm he had it bottled at his home, the same persons washing the bottles and caring for the typhoid patient. Thus it was accounted for. In his route through the city were found cases of typhoid fever.

In reference to the prevention of typhoid fever, we must remember that we do not know how long organisms persist in the stools after the patient has recovered from the attack. This is one chief source for the spread of the disease which should be borne in mind; after the patient recovers and goes about his business he still may be a source of infection on account of the persistence of the organisms in the stools.

I did not understand whether Dr. Fulton said that the disease was more prevalent in the country than in the cities, or whether the mortality was greater. If the latter, I think it is due to the lack of facilities, for the farmer will not or can not get the necessary nursing for these patients, and the consequence is that they die because they are not properly cared for; in such cases, of course, the physician is not at all at fault. I think the source of mortality in the country districts is to be found in this lack of proper care, or a lack of ability or willingness to care for these patients.

With regard to the disinfection of the urine, Dr. Musser has already referred to the use of urotropin. In three cases of typhoid fever we found the urine free from organisms and apparently in a sterile condition two weeks after the patient had recovered from the disease after giving urotropin; before that time the urine was infected.

With regard to disinfection of the stools, I have found that powdered chlorid of lime thoroughly mixed with each stool is efficacious.

DR. WM. KRAUSS, Memphis, Tenn.—We have a municipal ordinance which requires that every case of typhoid fever be reported, and in accordance with that requirement I reported a case. A lay inspector called and asked if the party had used well water or cistern water and got the address of the milk man. He left no literature or instructions as to the hygienic management of the case. The patient, a young lady, was very fond of ice cream, and would send to a nearby factory for a little paperboxful perhaps once or twice a day, and this was probably the source of infection. I think a municipal health board culpable for entrusting such matters to a policeman. The inspector should be a specially trained medical man.

About ten years ago I kept the records of the board of health in Memphis, and in one year I noticed that the returns for the year were about 270 deaths from malarial fever and 35 deaths from typhoid fever. This was before our public

water supply was from artesian wells. Surely this was a wrong proportion of deaths from these two fevers, for in one season I had in my service at St. Joseph's Hospital about 400 cases of fever, in the neighborhood of 260 of which were malarial, of which latter only one died. Most of these patients were from the swamps about Memphis and were in a very bad condition. This would argue that many of the 270 deaths on the records must have been typhoid fever, since malarial fever with us is not so fatal.

DR. FRANK WARNER, Columbus, Ohio—It is doubtless true that some cases of typhoid fever develop as a result of an infection acquired in some other way than drinking water; by eating some raw vegetables which have on them some typhoid bacilli, or by any of the several but unusual methods of acquiring the disease. It remains a fact, however, that the number of cases which develop in any other way than by drinking infected water are very few indeed. Then, as this is the usual method of infection, it becomes the duty of physicians everywhere to urge better water supplies in their respective communities. Not only does it become our duty to speak of these things, but also to point out from time to time that the great underlying cause of typhoid fever is the result of an absolute indifference in various communities of the dangers arising from drinking the water that is ordinarily furnished by many municipalities. There needs to be a rude awakening from the absolute indifference to which many communities have fallen. If the people in a community really make up their minds that there is a real danger in an unfiltered public water supply the politicians who operate the places will quickly install the most modern and approved methods of purifying water. They will give any community just as good water as they demand, and no better. It seems to me that it is time we should seek to prevent this disease on a greater scale than mere study and prevention of individual cases. This prevention on a large scale can best be accomplished by the construction of public filtered water supplies. And this filtered water is rendered purest by sand filtration. It is frequently argued against sand filtration that it does not remove all the bacteria of a disease-producing character. This is entirely true. It does remove some 98 or 99 per cent. of the pathogenic germs. Dr. William H. Welch has stated that one is not so likely to develop typhoid fever from drinking water which is only slightly infected with the typhoid germs as where it contains a large number of them. Then, if sand filtration does not remove all germs, and consequently all danger of infection, as it does remove at least 98 per cent. of the germs, it removes an equal per cent. of the danger of infecting the individual drinking the water. The ideal filter plant would remove all germs of a disease-producing character. Inasmuch as this can not be done, we must be content for the present to attain such a great improvement in the purity of a water in a community. And just in proportion that a pure water is furnished to a community, in just that proportion are we meeting the chief indication of prevention of typhoid fever.

Again, I believe that securing of a better water supply in any community should be a part of the labor of the physician and bacteriologist as well as the engineer. And this labor of the physician and bacteriologist should be as liberally paid for as the labor of the engineer. In seeking a water supply the engineer should be aided by the bacteriologist. This aid should not consist, as it does so many times when the engineer calls such help, in simply examining the water for a time or two, but careful bacteriologic examinations should be made over a considerable period; these examinations should be made under varying conditions, so that a reliable conclusion may be drawn. While it is true that some of the more able sanitary engineers cover these points, still it is the rule that in the establishing of a public water supply the engineer regards it as distinctively an engineering problem rather than a joint undertaking of the engineer and the bacteriologist and physician. When this fact becomes better known and recognized we shall have purer water supplies and less typhoid fever.

DR. J. N. HURTY, Indianapolis—It seems to me that the question of prophylaxis goes back further than we teach. At

first we thought that, after the etiology of the disease had been discovered, all we had to do was to disinfect the dejecta. Now we find that there are clinicians and diagnosticians who do not make out all cases of typhoid fever. We all know that the dejecta carry the typhoid organisms long after the patients are seemingly well, months after in some cases. This fact should teach us something. We must not only disinfect the dejecta, but we must properly dispose of it; if that be done then we will soon abolish typhoid fever. I believe that all intestinal disorders, the germs of which are cultured in the intestines, will spread under certain conditions in the towns and large cities unless we treat and do away with the dejecta. We must filter the water in our towns and cities; and we must see that the dejecta are cared for in a sanitary way, then typhoid fever will certainly be abolished. I have read there was practically no sanitation in the days of Henry VIII, and that at that time the dejecta and slops were thrown into the streets; the proposition to care for them in pits was received with scorn and ridicule. But when the streets were used no longer for dejecta disposal there was a pronounced diminution in the number of cases of disease that arose from such causes; the death rate of typhoid fever and other diseases fell, and health conditions improved, after the human dejecta were cared for in pits. Let us go deeper into the study of this question and let us learn to care properly for all dejecta; then I can promise that the disease will disappear.

DR. HENRY SEWALL, Denver—In the prophylaxis of tuberculosis it is admitted that physiologic resistance of the individual to the growth of tubercle bacilli is only second in importance to the exclusion of the bacilli themselves. In the prophylaxis of typhoid fever all sanitary effort seems to be restricted to the exclusion of the germ, and we hear nothing of the means of increasing the vital resistance of the individual after the manner which, in the conflict with tuberculosis, has proved so effective. The development of typhoid fever in a person is very largely determined by his physiologic condition while the typhoid germs lie in his intestines. A man recently under my charge had a mild run of fever for a few days; the Widal test was negative and the attack seemed clearly of "functional" nature. He was allowed to get up and increase his diet after some ten days, when shortly he became seriously ill, the blood test became positive and he nearly died with typhoid fever. Again, a little boy declared himself to have been perfectly well until he ran a foot race, when he was suddenly seized with vomiting and abdominal pain, ushering in a well-marked attack of typhoid fever. In each of these cases the attack of typhoid was exacerbated or precipitated as the result of physical exertion. A large proportion of our typhoid patients come from the hardest and healthiest class of people. But they fall victims to the disease while engaged in work which upsets their physiologic equilibrium. They are very apt to be compelled to work to fatigue in the intense heat of the sun. It is not hard to imagine that under such conditions the germicidal powers of the gastric juice might deteriorate and the vital resistance of the body fluids and tissues themselves might be reduced. We might, therefore, speak of every individual enjoying, as regards typhoid fever, a certain immunity on a sliding scale. With every physiologic function doing well its co-ordinated task, the typhoid germ may possibly be ingested with impunity; immunity is high. But let the vital machinery falter ever so little and infection readily occurs; immunity is low.

DR. DEERING J. ROBERTS, Nashville, Tenn.—Medical science is based on fact and on proof. Theories in medicine arise, spring up, live or die, depending on that idea. You can not build theories and make facts to fit them. Dr. Happel gave you the results of his observations; our work here is the result of observations. He records his observations of facts in his locality. On the other hand, representatives of Johns Hopkins and the University of Pennsylvania tell what they do not see. The microscope will tell you a fact and give the clinician aid when sustained by clinical observations. These men come with statements; Dr. Happel comes with observations. Take the humblest court in the land and submit to the

bench two or three credible witnesses and you will be able to establish an observation as a fact. There is one witness from Arkansas. Dr. Witherspoon of Tennessee tells you what he saw. I claim to have seen the same fever for forty years. The Surgeon-General of the United States saw in the Army reports during the sixties something that was not down in the text-books, and he essayed to find out about it, only he went a little bit further and gave it a name. His efforts were sterile, so much so that he took back what he said regarding this fever and said he did not say it. Typhoid-malarial fever belongs to the ages of the past. One gentleman came here and endeavored to prove by therapeutic demonstration that we had a typho-malarial fever, "this and nothing more." You must look at things as they are and not as you wish to have them. I have seen 40 consecutive cases of fever in one season. Five years ago, before the Tennessee State Medical Society, I gave the clinical notes of a fever, "this and nothing more." This was not enteric fever. It ran along and gave an erratic temperature. Some have called it paratyphoid and atypical typhoid, etc. A leopard may change its spots, but still it is a leopard. There are certain characteristics about it which you can always recognize. What constitutes typhoid fever? The bacillus of Eberth must be present. Let the gentlemen with their monoculars and binoculars say what they please; we have the same in the laboratories in Tennessee. We have a series of recorded cases reported and published in the state medical society's transactions, with carefully trained observers, teachers in laboratory work, and in this series of cases the bacillus of Eberth was wanting. We have had it stated by able clinicians that this is a fever with erratic temperatures; that it was not attended by the abdominal symptoms of typhoid fever. I have seen 40 cases lasting 14 days or less, all of the same type. There have been reported 90 successive cases and none went beyond two weeks' duration. This is nothing but fever; let it alone and the patient will get well.

DR. C. F. ADAMS, Trenton, N. J.—We have flies and mosquitoes in New Jersey; the mosquitoes are growing less, so is malaria. The Delaware river is a large sewer, and those who live along its banks become infected with typhoid fever. We make our differential diagnosis by taking a drop of blood on a slide for the Widal reaction, and also smear a cover slip for the plasmodium, and mail them to the state laboratory, where they are examined free. We should like to have the government prohibit the use of unfiltered Delaware River water for drinking purposes.

DR. JAMES TYSON, Philadelphia—I have been surprised that no reference has been made to the easiest and simplest way of making drinking water innocuous, i. e., by boiling. In Philadelphia to-day our hospitals are filled with typhoid fever cases largely to the exclusion of others, and I am sure that very few of these need have had typhoid fever if the drinking water had been boiled. Of course, we must look back to the source of infection. There are times when no filtration will protect the water against the typhoid bacillus; in fact, I believe that it is considered impossible to eliminate entirely the bacillus even when we have the best filtration plants; especially in times of great freshets, when there is a blocking up of the apparatus. If the working people could be taught to use no drinking water that had not been boiled many epidemics would be averted. Of course, the difficulty of doing this is evident, but we as physicians could do much by insisting on this practice, not only among the poor, but among the rich as well, and with all with whom we come in contact. The Schuylkill river water has not a good reputation, but I know of no instance where the disease has been acquired through the use of this drinking water after it was boiled. Boiling will effectually destroy the typhoid bacillus.

DR. JAMES J. WALSH, New York—A prominent sanitary officer once said that when somebody had typhoid fever somebody ought to be hung. We know that we can contract typhoid fever only from a typhoid fever patient. If that typhoid fever patient is not properly cared for somebody is to be blamed for criminal negligence. In large cities what is to be done?

Take a certain large city, not far from New York, which has had typhoid fever constantly in its midst for the past ten years. Every year there are a large number of deaths and the "boss" of that city has made the boast that he kept back the sanitary plant for a long time because provision had not been made for giving a part of the work to a friend of his. In this city there have been 3,000 deaths during that time from typhoid fever and nothing has been done toward getting a better and purer water supply. This boss has no sense of civic duty. Sanitary plants have been used in Germany for years; in Berlin proper filtration plants had been used thirty years before they had a death from typhoid fever. People on the farms have less death rate than in the city.

With regard to filtration, the little town of Altoona, near Hamburg, did not have a single death from cholera in spite of the fact that they used the water from the Elva. When this disease is communicated to another some one is criminally responsible. We should make the municipal authorities understand that the dangers lie in allowing certain tyrants to continue in control in sanitary work when there is a prolonged outbreak of typhoid fever.

DR. WALTER SHROPSHIRE, Yoakum, Texas—I am surprised at Dr. Tyson's statement that his patients might have avoided typhoid fever by boiling their drinking water, suggesting water as the only means of conveying the disease. In the town where I live, with a population of 6,000, there are 50 or more cases of typhoid fever each year. These people without exception use water from an artesian well, 1,400 feet deep, which is pumped direct into the mains and is never exposed to the atmosphere till drawn from the hydrant for drinking. If these people get typhoid fever through their drinking water I am unable to see how the bacilli get into it. Two years ago there was a case of typhoid fever near me treated by one who did not have the dejecta properly cared for, permitting it to be thrown out on the ground surface, this being in early summer when the ground was dry and dusty. Immediately following this case I treated 15 others within a radius of 300 yards of it, whose infection was traceable to this focus, and they could not have obtained the poison through water, for it was drawn from the hydrant and used immediately. I recall an experience of 12 years ago, when I treated a case of typhoid in December, and was unable to have any disinfectant used at all. The nurse simply threw the dejecta out in the back yard. During the balance of December, January, February, March and April we had no typhoid fever in that neighborhood. During May we had a drouth and the surface became dry and dust was prevalent, being carried by a prevailing southeast wind. The dry weather had existed not more than two weeks when typhoid began developing around this focus, and I treated 73 cases within a radius of 300 yards of it; and seven-tenths of them were to the northwest where the prevailing wind carried the dust from this infected focus. These people all used different water from surface wells about 70 feet deep and through a heavy clay and light rock strata. Now, if these people were infected through their drinking water why were there no cases through the five rainy months, when the earth surface was wet and why such preponderance of cases to the northwest where the prevailing wind would carry the dust from this infected focus? And if it be conceded that the spores were carried in dust by the wind and infected their drinking water, why could it not as well infect articles of food and thus reach the intestines of the individual? I am convinced that the dust was the means of infection in these cases as well as in many others. Again, our Spanish-American war demonstrated conclusively that flies can and do carry the infection, and Dr. Alice Hamilton of Chicago read a paper before this Association a year ago forcibly portraying the fact that flies do carry the infection. With such facts before us I think even Dr. Tyson should modify his remarks on the subject.

DR. T. J. HAPPEL, Trenton, Tenn.—The discussion of this morning has been on typhoid fever, not on the paper read by me on Tuesday.* The object of my paper was not to discuss

the subject of typhoid fever, but to report cases of a fever occurring in my practice, which were cases of neither a typhoid nor a malarial fever.

I do not claim that there is no typhoid fever in the section of Tennessee in which I live, but in my own town it has almost entirely disappeared. We have not had a case of it for years. We account for our peculiar exemption from the fact that all of our drinking water is filtered through a vast bed of sand underlying our town. Some geologist claims that we are located over what in ages past was a large body of water which has been replaced by sand, and through this sand of an unknown depth our water filters, rendering it almost perfectly pure. While in our immediate neighborhood we have no typhoid fever, yet in certain sections of our county typical cases of typhoid fever are found.

When the cases reported to me are referred to as "atypical," "paratyphoid," etc., you are begging the question. In reference to microscopic examinations in these cases, I stated that examinations had been made in 138 cases of this fever by persons who had the reputation of being skilled in the use of the microscope and in laboratory work. Thus my clinical observations were not left unsupported. One person discussing the paper suggested that the variations in temperature were due to the use of the coal-tar derivatives. The coal-tar products are never used by me except in those cases where I have failed to reduce the temperature by water and other febrifuges. In not one of the 100 cases which have come under my care has there been any tendency to hemorrhage. One member of the section referred to the fact that he had cured cases of this type by a certain routine medication, but my paper referred only incidentally to the subject of treatment. In the closing lines of the paper I mentioned the fact that I used guaiacal carbonate in treating these cases the last season. If cases of this type of fever are let alone and nursed well they recover without or in spite of medicine. One of my patients recovered who was given by her mother on one occasion a box of sardines and allowed to eat them all at one time. At another time this same child during the third week of her fever was fed enough biscuits to have surfeited a well person. Had this been a case of typhoid fever we would probably have had a funeral. I have treated two cases of this fever in pregnant females, one five months advanced, the other seven. Both miscarried, and on the day following the miscarriage the temperature in both cases fell to normal and never went above that point again. Both made uneventful recoveries, a very different result so far as my experience has gone with typhoid fever under similar circumstances.

I wish again to emphasize the fact that the cases reported by me did not present a single characteristic symptom of typhoid fever.

DR. JOHN S. FULTON, Baltimore—I regret that any one should have misinterpreted my demonstration of the higher mortality of typhoid in rural districts as a reflection on the rural physician's skill. I know nothing about the comparative case mortality as between town and country, and I assume that the higher absolute mortality in the rural districts means a correspondingly higher morbidity. No other conclusion can be drawn from the evidence. In treating cases of typhoid fever the city physician has, so far as I know, but a single advantage over his fellow in the country, and that advantage is in skilled nursing. The trained nurse may, perhaps, profit the case mortality by the 1 or 1.5 per cent., but in my opinion the chief profit of trained nursing lies in the control of morbidity.

I take occasion to say now what I did not say in my paper, that the trained nurse, proportionately to the numerical strength of her profession, opposes more effective barriers to the spread of typhoid than does the practicing physician. That may be construed as a criticism of the profession and may be added to the other criticism of a 48 per cent. default of professional skill in the diagnosis of typhoid.

I did not intend in my paper to touch the minutiae of prophylaxis, but I am glad that the discussion brought out the very

* See THE JOURNAL, July 11, 1903, pp. 82 to 96.

central problem of disinfecting stools. A disinfectant for fecal matter should be first effective, and after that must be cheap, rapid, safe and convenient. No agent yet proposed meets all these requirements or even a majority of them. I am inclined to regard quicklime or air-slaked lime as the most generally available disinfecting agent for typhoid excreta.

But above all things I want to impress the Association with the testimony of the profession itself, shown here in graphic form, and supporting, as I think, in the most convincing manner and for the whole United States, the testimony of the U. S. Army Commission that the medical men of the land habitually misinterpret the continued fevers of the United States. This is a definite and insistent challenge at the very threshold of the prophylaxis of these fevers. What will you do about it?

SHALL WE OPERATE ON DEFORMED SEPTA IN CASES OF ATROPHIC RHINITIS?*

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Much has been written about this very greatly afflicted class of patients, and little has been accomplished. They should receive our best care for their own good and for the relief of the people with whom they come in contact. True, our horizon is the limit of our vision. The atrophic patient does not know the pleasure derived through the sense of smell; at the same time he does not appreciate the disgusting foul smell which makes him an undesirable member of society. The ancient Greeks considered *ozena* a good and sufficient cause for divorce. It was also considered a bar to the priesthood. Surely we may well advise against transmission to future generations.

Where a patient is convinced that he is an offense wherever he goes much has been done to gain the necessary perseverance in treatment. With eternal vigilance on the part of both physician and patient, results may be accomplished—a percentage of cures and the abolition of foul odors. The knowledge that we are shunned because of some avoidable defect in ourselves is about the greatest stimulus that can influence us.

Sclerosis or atrophy, without crusts or excessive secretion, due to overwork and pressure, is more advanced on the roomy side and in the inferior turbinates, the middle turbinates often being hypertrophied. Pressure on the tissues and an effort to perform normal function constantly irritate the narrow side, while the overwork and too free passage of air irritate the roomy side. Deflected septa plus spurs and ridges with enlarged pharyngeal tonsils are the local causes which lead to this condition. If this class of cases only is considered I am inclined to agree with the writers who claim that atrophy is a purely local condition, not dependent on other diseased conditions. I also believe that it is readily and quickly cured or much improved by the removal of the pharyngeal tonsil and by equalizing as nearly as possible the nasal space by correcting the deflected septum and removing ridges and spurs.

Add to the above local conditions a depraved constitutional inheritance and there results the class of cases generally recognized as atrophy. With the great loss of tissue, particularly turbinate tissues, all of which are involved, a very different picture is presented—marked *ozena* of a musty character, excessive secretion and crusts, with usually complete loss of smell. There is

frequently a large lingual tonsil with little or no enlargement of the pharyngeal tonsil, a generally depraved constitutional condition, deranged stomach and bowels, irritable bladder, severe headaches, etc.

From careful observation and study of these cases I am convinced that heredity plays a very important—if not the most important—part in their production. Usually more than one member of a family is afflicted; and, if the inheritance is not direct from mother or father, investigation will trace it to uncles and aunts or to grandparents. One or more members of a family may have marked atrophy while others are subject only to frequent attacks of purulent rhinitis. In the absence of these local or constitutional causes repeated attacks of purulent rhinitis never develop atrophy.

The moderately enlarged pharyngeal tonsil is usually beneficial and many hesitate to remove it. In time past most operators have objected to correcting septal deformities for fear of added destruction of tissue in a space already too roomy, claiming that the spurs, ridges, etc., are a benefit. Perhaps they would be a benefit if they equalized the space and if they did not tend to the retention and difficult removal of the secretion. The retained secretion is a constant menace to the entire respiratory tract, accessory sinuses, and, in fact, to the whole system. The general and local conditions react on each other, and probably more depends on the local than on the constitutional treatment for the general improvement. At the same time, the better the general condition the more rapidly will the local condition respond to treatment. I have had several cases in which constitutional treatment had been given for years with little success in relieving the general condition; and local treatment alone relieved all the symptoms of stomach, bladder, etc.

Please do not understand me to advocate neglect of any of the cleansing, disinfecting and stimulating treatment which is so necessary in these cases and which must not be left entirely to the patient. The skilled physician can see and remove much secretion not within the reach of the patient. The more thorough the cleansing the more rapid will be the improvement. I do wish to urge securing the best possible local condition.

After a careful study of the cases and a few thorough cleansings, operate. Operate first on the sinuses of the roomy side if they are involved. As completely as possible correct the septal deflections, removing only the thickenings necessary to bring the septum into the median line. Later smooth up the septum as the individual case may demand. The tissues have not the recuperative power of normal nasal tissues, and much care must be used in the operation, not only to remove as little tissue as possible to gain the desired correction but to make no undue or unequal pressure, especially on the cartilages. Change the splint frequently and continue its use the shortest time possible. Never use a pin in an atrophic septum. A pin will often cause perforation in twenty-four hours and, once formed, the conditions are not favorable to its closure. Stimulate all cut edges to secure an over, rather than an under, inflammatory reaction. Excessive granulation tissue can easily be removed. With these precautions I am confident that operative interference will hasten the cure of atrophic cases.

The earlier in the course of the disease the operation is done the quicker and the better are results. I have yet to operate on a patient that does not see and admit

* Read at the Fifty-fourth Annual Session of the American Medical Association, in the Section on Laryngology and Otology, and approved for publication by the Executive Committee: Drs. George L. Richards, O. Joachim and G. V. Woollen.