Frederick Treves, in which it has been pointed out that the death rate from cancer in Australia, where no chilled nor preserved meats are employed, has risen from 74 per 100,000 in 1915 to 87 per 100,000 in 1921. Further than this, there are good observers who deny that cancer has increased, believing that the supposed increase is due to more exact diagnosis. Certainly a clear case has not been made out against modern foods.

We do not wish to excite unnecessary apprenhension or alarm, and the equanimity with which not only the profession but the public has received similar statements in the past relieves us from any anxiety on this score. We believe, however, that these subjects call for consideration, and that some positive answer should be given to the notable increase which has been observed in the incidence of certain diseases for some years past.

## THE BIOMETRIC METHOD

Even the casual reader of scientific literature, particularly that relating to medicine and public health, must be impressed with the rapidity with which the methods of the so-called Biometric School have been adopted by scientific workers. The application of the method to vital phenomena in this country is so new and the nomenclature and notation so unfamiliar that many physicians and sanitarians find themselves unable to come to any conclusion as to the value of the method itself or the credibility of the results of its application.

In so far as the new technic enables the worker in science better to distinguish between *post hoc* and *propter hoc* and to eliminate the influence of chance variation, it has already justified itself and is undoubtedly destined to have a profound and beneficial effect on all statistical work in connection with medicine and public health. The question, however, as to whether the more elaborate and "refined" statistical method with its laborious computing of coefficients and fitting of curves will not make more difficult rather than simplify the accurate interpretation of observed phenomena, can not be considered as settled.

Even the casual worker with figures recognizes the inevitable tendency of a prolonged series of mathematical operations to obscure the real significance of the phenomena from which the original figures were derived. It is so much easier to perform additional statistical procedures than to enlarge the basis of observation or to repeat experiments and so much easier to apply a correction for defects in the original data than to search for new data without defect that the statistician tends to lose mental contact with the phenomena he seeks to interpret.

Laboratory experiments have a most discouraging tendency to go awry and to produce dissimilar results under apparently similar conditions. The observer of such phenomena is constantly reminded of the fallibility of the human understanding and the perverseness of inanimate things. Statistical procedures, however, when accurately performed, always produce the same result from the same processes applied to the same material. This infallibility of the statistician's technical processes tends to produce the feeling on his part that the whole procedure, including the choice of material and the interpretation of results, is as infallible as the technical operations themselves.

Physicians and sanitarians, therefore, in seeking to appraise the value of the new technic must of necessity familiarize themselves with its elementary notation and nomenclature and must master at least the essentially simple principles of the probable error concept. As to the more far-reaching claims for the new method only time and a rigidly critical analysis of the results of its application will bring final determination.

In any event, it is true now as always that no statistical procedure however elaborate or refined is a substitute for careful choice and accurate collection of original material or for thoughtful or correct interpretation of the results of its analysis. The new method is, after all, only another tool, and results of its use will depend far more on the material and the worker than on the tool itself.

## THE SCHICK TEST AND RACIAL IMMUNITY

The JOURNAL has during the past few years published a number of authoritative papers on the Schick test and toxin-antitoxin immunization against diphtheria. At the Boston meeting the matter came up for further discussion led by a most interesting paper by Dr. Sears of Auburn, New York, a city of 36,000 inhabitants. In the discussion by Dr. Ceconi, of the Boston Health Department, interesting similarities between Auburn and Boston, a city of 800,000, were shown. The number of positives in the smaller city however exceeded those of Boston by 13 per cent. In both cities a strong natural immunity was seen in Italian and Polish children.

There is a widespread opinion that conditions of living in crowded cities brings about an immunity to many diseases among those who survive the early period of life. This was strikingly shown in the late war in regard to several of the acute infectious diseases. In some instances where two regiments, one recruited from the city and one from the country, both of the same state, were compared, it was shown that while more country boys passed the first examination than did city boys yet they were tremendously more susceptible to acute diseases such as measles, mumps, pneumonia, etc. The striking immunity to diphtheria shown by Italian and Polish children cannot be ascribed altogether to conditions of crowding. In the North End of Boston, which is one of the most densely populated parts of the city, a pupil population of 621 Italians showed 80 per cent immunity under the Schick test. Only 200 yards away another school showed only 58 per cent immunity, whereas the Italian children in this school showed 85 per cent immunity. In the suburban districts, away from this dense foreign population, the Italian children in a certain school showed an immunity which ran to 70 per cent, while the average of the school was only 45 per cent. The Italian children who were susceptible were more than usually so, since it was uncommon to find them immunized after three doses of toxin-antitoxin.

A tabulation of 12,257 cases in Boston by Dr. Eaton gives some most interesting results. It shows that the age distribution of children who die from diphtheria does not follow the same curve as those who are susceptible as shown by the Schick test. Taking only those under the age of fifteen and dividing them into five year groups, we see that the susceptibles bear the approximate relation to each other of 50 : 31 : 19, while the numbers of those who die in the same age groups are related to each other as 64 :30 :6. In other words there is a preponderance of deaths over susceptibles in the group under five years of age of 64 to 50, while for the ten to fifteen age group there is a deficiency in the ratio of 6 to 19. This is illustrated more exactly in the following table:

| Age | Deaths | Per Cent | Susceptibles | Per Cent |
|---|---|---|---|---|
| 0– 5 | 1218 | 64.2 | 50,512 | 49.36 |
| 5–10 | 567 | 29.88 | 31,967 | 31.26 |
| 10–15 | 109 | 5.744 | 19,818 | 19.369 |

A fair conclusion is that the death rate from diphtheria is not merely a matter of susceptibility nor of the number of contacts, since the twelve-year-old child