THE EPIDEMIOLOGY OF INFLUENZA.

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The late epidemic of influenza attacked the New England States in the months of December, 1889, and January, 1890. It was preceded in various localities by sporadic or mildly epidemic cases for a period varying from a few weeks to several months. An observer on one of the islands of our coast records a limited epidemic that visited that region in the spring of 1889; and in the following September there occurred a local epidemic in New Brunswick which climatologically may be considered with New England. Scattered records of sporadic cases have been published as occurring one or two months prior to the general epidemic, and many physicians will recall cases which, from the very fact that the symptoms were marked but not in accord with any well-known type of disease, were accurately noted at the time. These cases are of great value in establishing the presence of influenza previous to the great epidemic; indeed, there can be little doubt that influenza was slowly gaining ground for some time before the disease acquired its full force. It rapidly assumed an epidemic form and as rapidly disappeared; but, just as there were premonitions, so there were after-mutterings of the storm continuing for months. During the winter of 1890 and 1891 the disease struggled to assume an epidemic form for a second time, but without marked success.

It is difficult to assign any date as that of its first appearance except in scattered localities where the observations were sufficiently numerous to warrant conclusions. In Boston the disease may be said to have become epidemic on December 19th and 20th; but in other parts of Massachusetts and in the other New England States the date varies considerably, being later in the west and south. In the same way the date of maximum prevalence, being for Boston the week ending January 11th, varies as the date of onset, but perhaps with less latitude. Subsidence rapidly followed
the period of greatest prevalence, lasting, as a general rule, into
the month of February. The period of incubation in individual
cases averaged four days, at times extending to a week or more.
The duration in individual cases—that is, the duration of the
acute symptoms—lasted from three to eight days in about 80 per
cent. of several thousand reported cases. Complete recovery from
the disease, however, frequently did not follow for months.

Patients between the ages of fifteen and fifty were more liable
to be attacked than those younger or older, although the latter
were by no means exempt, even nursing infants not escaping.

As to the question of sex, it is more difficult to establish any
definite rule. In certain localities or certain occupations one sex
might be affected to an astonishing degree and the other sex
escape without any apparent reason. In those portions of the
States where the exposure to the weather would necessarily be
most severe, men were as a rule affected in larger proportion than
women. Men were evidently more seriously affected because,
being the wage-earners, they were obliged to keep about longer
than was prudent. In many of the large manufactories it is not
surprising to find that the male employés, exposed to sudden
changes and to hard work, were almost universally afflicted.
Among the well-to-do classes, however, one finds a preponde-
rance of women affected.

The proportion of those attacked to the entire population can-
not be determined with anything approaching to accuracy. Most
reports published are wild guesses; but, even allowing this to be
the case, the estimates are actually no more erratic than the vari-
ability in institutions or mills where the inmates were under close
and accurate observation and where the conditions of living, work,
exposure, poverty, etc. were similar. Why one cotton-mill should
have only one employé out of 300 affected, and another mill near
by should have from 50 to 75 per cent. affected, it is impossible
to say with the data at hand.

The length of time lost by mill-hands was a little less than a
week on the average, the aggregate loss in Massachusetts alone in
147 mills amounting to about 265 years. Among the out-door
poor in the city the absence from work was much longer, lasting
from three to five weeks; but that is perhaps not surprising when
the fact is considered that this class lives in much inferior quarters and has fewer means for medical and hygienic care.

Headache was one of the most constant symptoms, often very severe, beginning early and continuing long after the acute stage, ushered in quite frequently by a chill, and for the most part frontal, in which case the intensity might often be explained by an acute inflammation of the upper nasal and ethmoidal regions. With the headache were associated backache and a general bruised feeling. Delirium, especially frequent in children, apparently depended very little on marked pyrexia. Closely approaching this nervous phenomenon, insomnia as well as mental depression was frequently noted, the two conditions merging one into the other; and it is worthy of notice that the feeble-minded suffered in this respect as well as those mentally sound.

The disturbance of the digestive mucous membrane was more erratic. Nausea and vomiting varied, as symptoms, in different localities; intestinal disturbance, with diarrhoea, was common in the northern and eastern portions, while to the south constipation was noticeable. In both classes acute abdominal pains, especially in women, were accompaniments.

Although coryza can be considered as a very constant attendant, it is surprising to see how seldom it was noted as a marked symptom. When present it was of short duration.

Of more significance, on account of its stubbornness and the distress caused thereby, was cough—spasmodic, dry, severe, with but slight expectoration and slow in yielding to drugs. In many, especially the aged and weak, it was truly alarming. Except in cases of typical bronchitis, auscultation revealed very few râles, and when present they were entirely out of proportion to the severity of the symptom.

Nothing can be learned from the temperature-charts except that fever was not noticeably severe in the general run of cases; and, judging from its effect in other diseases, it was entirely inadequate to cause the profound systemic disturbance so frequently observed.

Among other symptoms or accompaniments, but of doubtful value as a means of diagnosis, were the various forms of neuralgia, laryngitis, aphonia, anorexia, etc. Pre-eminent, as a result,
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if not a symptom, arising early and continuing to unexplained lengths, was prostration, affecting all ages, all conditions, most annoying to patient and physician, and yielding slowly to any form of treatment.

Conspicuous in the history of the epidemic, especially along the eastern borders of the States, was lobar pneumonia, and whether it was a sequel or an accompaniment, it helped to transform an otherwise moderately severe epidemic into one that proved as fatal as an epidemic of cholera. The deaths from pneumonia were four times as numerous as in the corresponding months of previous years—a much higher rate than that reported from the States lying to the south of us. Moreover, croupous pneumonia was distinctly more commonly reported than that of the catarrhal type, the opposite being the case in the warmer States.

The rate of mortality, however, was not notably increased over previous years, and resolution by lysis rather than by crisis was commonly observed. When occurring during or as a result of the epidemic, pneumonia began in a large percentage of cases within one week after the patient had been attacked by the influenza. Men were subject rather than women in the proportion of three to one.

All cases of pneumonia occurring at this time were, however, not distinctly preceded by influenza. A large number were, probably nearer 75 per cent. than 50 per cent. of all cases; yet, on the other hand, the number of cases that clearly had no connection with the influenza was smaller than during the corresponding period of previous years.

Bronchitis in every form was naturally increased. Phthisis was increased, the influenza acting as direct exciting cause, and the death-rate in those previously affected was much swollen, as would be expected. Cases of otitis were numerous; glandular trouble was rare.

Insanity, awakened undoubtedly in a small proportion of cases, had generally some predisposing history as well. Recovery among these took place in a larger average of cases than usual.

Other epidemic diseases were distinctly less prevalent.

The mortality from influenza pure and simple was small, but the mortality during the epidemic period was alarmingly heavy. In great part we owe this loss to the combined result of a
markedly debilitating disease becoming fastened upon patients with resisting powers already lowered by chronic and wasting diseases, and by the great increase of acute pneumonia. Many of the deaths from wasting diseases were in cases that needed only some acute, additional stroke to complete the work that had long been pending. In the period that followed subsidence of the epidemic, the decrease in deaths from such diseases was noticeable, but by no means in an inverse ratio as might be expected.

On comparing the mortality rate of the larger New England cities with that of other cities throughout the Union, it is significant that there was a marked increase in all cities lying to the north of the fortieth degree of latitude.

Locality as regards elevation above the sea-level, a moist or dry soil, or proximity to the sea-coast, had very little to do with the prevalence of the disease. Thickly populated districts suffered more in amount and severity than those sparsely settled. By making a general, broad calculation, although verification is needed, it seems as though the so-called wave started, in Massachusetts at least, from the eastern, urban portion of the State—that is, Boston and its immediate neighborhood—and radiated thence to the north, west, and south, gradually appearing later at the outer ends of the radii. A similar condition was observed independently at various other cities, but what rôle the railroads played in this dissemination depends upon the importance given to the contagiousness of the disease.

During the winter just passed (1890–1891), a very much modified epidemic was repeated, probably of less importance than is generally ascribed to it. In discussing the characteristics of this visit as compared with that of the previous year, practitioners describe a more or less marked difference in the general run of symptoms, but there are no accurate data upon which to base definite conclusions; and when one recollects how varied the individual experiences of physicians were at the time of the great epidemic and how similar that epidemic was to all the great preceding epidemics, the less likelihood is there that there was any marked peculiarity in the smaller epidemic of last winter.

In closing, the writer wishes to acknowledge his indebtedness in particular to Dr. S. W. Abbott's elaborate and able paper published in the Report of the Massachusetts Board of Health for 1889.