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EPIDEMIC INFLUENZA

DIXEY

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EPIDEMIC INFLUENZA

A STUDY IN COMPARATIVE STATISTICS

BY

F. A. DIXEY, M.A., D.M.

FELLOW OF WADHAM COLLEGE

WITH DIAGRAMS AND TABLES

πολλὰ μὲν γᾶ τρέφει δεινὰ δειμάτων ἄχη

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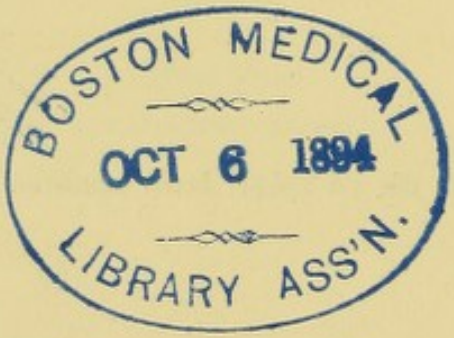


TO

SIR HENRY W. ACLAND, BART., K.C.B., M.D., F.R.S., &c.,

REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD.

DEAR SIR HENRY ACLAND,

No one who has felt the influence of your teaching is likely to underrate the value of the attentive study of Vital Statistics; and to no one more than to yourself is due the awakened feeling of responsibility throughout this country, among public and private men alike, in all matters pertaining to what is fitly called, in a wide and true sense, Preventive Medicine. It is with a very full sense of the debt owed to you by the community at large that I venture to inscribe to you the following pages.

Believe me,

Very sincerely yours,

F. A. DIXEY.

June 9, 1892.

PREFACE

THE remarkable prevalence of influenza during the last three or four years has given occasion for considerable additions to the already extensive literature of the disease[1]. The phenomena of various outbreaks of this malady have been described and discussed at great length by numerous authorities, and in some respects with a completeness that leaves little to be desired. Nevertheless there still remain many points, relating especially to the actual nature and ætiology of influenza, concerning which our knowledge is extremely imperfect; and it is as a contribution towards the better understanding of these parts of the subject that the following pages have been written. They are the result of an extended investigation into the statistical materials which have been accumulating for many years past under the direction of the Registrar-General; and which when carefully analysed and compared with such similar data as are available from foreign sources, seem likely to throw much light on what may be termed the natural history of diseases in general.

There are several directions in which the evidence which may be collected from such statistical returns as we now possess is seen to be of the greatest value. For instance, the record of separate causes of death in London published weekly by the Registrar-General's Department puts it in our power to trace the history of an epidemic outbreak with great exactness; to observe the distinctive features of its rise, prevalence and decline; to compare its behaviour under various conditions with that of other diseases; to note its varying incidence in regard to age and sex; while the data

[1] The list of treatises on influenza printed in Hirsch's 'Handbook of Geographical and Historical Pathology,' ed. New Syd. Soc. 1883, vol. 1, fills 12½ octavo pages in small type.

concerning temperature, rainfall, wind, &c. furnished in the same publication enable us to attack the question of the relation between meteorological conditions and various forms of disease with the best prospect of success. The method of 'concomitant variations' which so often gives a clue to a previously unsuspected causal relation between distinct series of phenomena is here capable of a tolerably precise application. It is true that these detailed statistics are obtainable for one city only—London; but the population involved is so large that the results may be accepted as being practically free from the fallacies that are apt to lurk in conclusions derived only from a limited area.

Those readers who are accustomed to deal with statistics in general, or with the figures furnished by the Registrar-General's department in particular, will not need to be told that the crude data as presented in bills of mortality, meteorological tables, and the like, need much grouping and arrangement before they can be made to yield all the information that is really contained in them. Statistical details have to undergo a process somewhat resembling the 'reduction' of astronomical observations before they become actually useful as a means of comparison and investigation—not that the 'reduction' introduces any new element, but merely that it unfolds and renders generally available what was previously wrapped up in and obscured by the bare enumeration of facts. The Tables that follow, although they contain no statement that cannot be verified by reference to the documents of the Registrar-General's Department and the corresponding returns of foreign cities, are not, themselves to be found in those publications; they represent indeed a special selection and grouping of data that are capable of throwing light on the particular subject in question, and in most instances they contain examples of the help that can be given by various modes of 'reduction' towards grasping the real significance of statistical results. The calculations that have been involved in their preparation, such as the statement of so large a number of 'total deaths' as percentage departures from a corrected mean [1], though the materials have been to a large extent already

[1] See explanations in the text, especially pp. 8, 9, 14.

supplied by the official statisticians, are necessarily extremely laborious; nevertheless I cannot but trust that the Tables will lighten the labour of future investigators, and so justify the time and trouble that have been expended in bringing them into their present shape. In the same way the diagrams will, I hope, be found useful by those readers who wish to see the most salient results of the officially recorded numbers displayed in a graphic and easily intelligible form.

It will be observed that the last of the three waves of the epidemic that have lately passed over London has not been treated of on the same scale as the former two. The reason of this is that while the attack was proceeding it seemed better not to delay the production of the book until the figures of the last invasion could be fully given. Had I foreseen the delay that has unavoidably occurred in the reproduction by lithography of the illustrative diagrams, I should have taken measures to make the Tables for 1892 more complete.

In conclusion I have to thank Sir Henry Acland, Regius Professor of Medicine in the University of Oxford; Dr. G. B. Longstaff, Author of 'Studies in Statistics;' as also Mr. A. C. Waters and other gentlemen of the Registrar-General's department, for much kindly given help and advice.

Note.—By the courtesy of Dr. Murray, editor of the 'New English Dictionary' now in progress, I have been enabled to inspect the materials in his possession for the article 'Influenza' in a forthcoming volume. It appears that the use of the word in England dates back only to 1743, during which year it was imported from Italy as the designation of the disease that has within the last year or two again become so familiar. The earliest instance of the occurrence of the word in English literature seems to be in the 'London Magazine' for 1743, p. 145, where mention is made of an 'Article of News from Rome of a contagious Distemper raging there, call'd the Influenza.'

CONTENTS

PAGE

I. The Epidemics of 1847, 1848, and 1889, 1890 1

1. The General Course of the Outbreak 1

2. The Influence of Meteorological Conditions . . . 3

3. The Effect of Epidemic Influenza on the Mortality from other Diseases 5

4. The Age-Relations of Influenza 13

II. The Epidemic of 1891 in London 20

1. The General Course of the Outbreak 20

2. The Influence of Meteorological Conditions . . . 21

3. The Effect on the Mortality from other Diseases . . 21

4. The Age-Incidence of Influenza during the Epidemic of 1891 23

III. The Epidemic of 1891, 1892, in London, Paris, Berlin, and other Cities 25

1. The General Course of the Outbreak 26

2. The Influence of Meteorological Conditions . . . 26

3. The Effect on the Mortality from other Diseases . . 27

4. The Epidemic in its relation to Age and Sex . . . 27

Tables 30

LIST OF TABLES

AND SOURCE WHENCE MATERIALS ARE DERIVED

TABLE I. LONDON, 1890. MORTALITY FROM INFLUENZA AT DIFFERENT AGES.
'Weekly Return of Births and Deaths in London and in Thirty-two other great Towns.' By authority of the Registrar-General, London, 1890.

" II. LONDON, 1847, 1848. MORTALITY FROM INFLUENZA AT DIFFERENT AGES.
Registrar-General's 'Weekly Returns,' London, 1847, 1848.

" III. PARIS, 1889, 1890. TEMPERATURE, RAINFALL, &C., AND MORTALITY FROM INFLUENZA.
'Bulletin Hebdomadaire de Statistique Municipale,' Paris, 1889, 1890.

" IV. BERLIN, 1889, 1890. TEMPERATURE, AND MORTALITY FROM INFLUENZA AND OTHER DISEASES.
'Veröffentlichungen des Statistischen Amts der Stadt Berlin,' Berlin, 1889, 1890.

" V. LONDON, 1890. TEMPERATURE, RAINFALL, &C., AND MORTALITY FROM INFLUENZA.
Registrar-General's 'Weekly Returns,' London, 1890.

" VI. PARIS, 1889, 1890. MORTALITY FROM VARIOUS DISEASES.
'Bulletin Hebdomadaire,' Paris, 1889, 1890.

" VII. PARIS, 1889, 1890. MORTALITY FROM VARIOUS DISEASES.
'Bulletin Hebdomadaire,' Paris, 1889, 1890.

" VIII. LONDON, 1847, 1848. MORTALITY AT DIFFERENT AGES FROM INFLUENZA AND OTHER CAUSES.
Registrar-General's 'Weekly Returns,' London, 1847, 1848.

" IX. LONDON, 1890. MORTALITY AT DIFFERENT AGES FROM INFLUENZA AND OTHER CAUSES.
Registrar-General's 'Weekly Returns,' London, 1890.

TABLE X. LONDON, 1888, 1889, 1890. ACTUAL AND PERCENTAGE MORTALITY AT DIFFERENT AGES FROM INFLUENZA AND OTHER CAUSES.
Registrar-General's 'Weekly Returns,' 1888, 1889, 1890.

,, XI. PARIS, 1889, 1890. MORTALITY AT DIFFERENT AGES.
'Bulletin Hebdomadaire,' 1890.

,, XII. LONDON, 1847, 1848, 1888, 1889, 1890. MORTALITY AT DIFFERENT AGES FROM INFLUENZA AND OTHER CAUSES.
Registrar-General's 'Weekly Returns,' London, 1847, 1848, 1888, 1889, 1890.

,, XIII. LONDON, 1891. TEMPERATURE, RAINFALL, &C., AND MORTALITY FROM INFLUENZA.
Registrar-General's 'Weekly Returns,' London, 1891.

,, XIV. LONDON, 1891. MORTALITY FROM DIFFERENT CAUSES.
Registrar-General's 'Weekly Returns,' London, 1891.

,, XV. LONDON, 1891. 10 WEEKS, 17TH–26TH. MORTALITY AT DIFFERENT AGES.
Registrar-General's 'Weekly Returns,' London, 1891.

,, XVI. LONDON, 1891, 1892. TEMPERATURE, RAINFALL, &C., AND MORTALITY FROM INFLUENZA.
Registrar-General's 'Weekly Returns,' London, 1891 and 1892.

,, XVII. LONDON, 1891, 1892. MORTALITY FROM INFLUENZA AND OTHER CAUSES.
Registrar-General's 'Weekly Returns,' London, 1891 and 1892.

,, XVIII. PARIS, 1891, 1892. TEMPERATURE, RAINFALL, &C., AND MORTALITY FROM INFLUENZA.
'Bulletin Hebdomadaire,' 1891 and 1892.

,, XIX. PARIS, 1891, 1892. MORTALITY FROM INFLUENZA AND OTHER CAUSES.
'Bulletin Hebdomadaire,' 1891 and 1892.

,, XX. BERLIN, 1891, 1892. TEMPERATURE, AND MORTALITY FROM INFLUENZA AND OTHER DISEASES.
'Veröffentlichungen des Statistischen Amts der Stadt Berlin,' 1891, 1892.

,, XXI. VIENNA, 1891, 1892. CASES OF INFLUENZA AND MORTALITY FROM OTHER DISEASES.
'Mittheilungen des statistischen Departements des Wiener Magistrates. Wochenberichte.' Vienna, 1891, 1892.

TABLE XXII. (*A*) LONDON, BERLIN, AND STOCKHOLM, 1890, 1891, 1892. PERCENTAGE MORTALITY FROM INFLUENZA AT DIFFERENT AGES.

(*B*) PARIS, 1892.—1ST 3 WEEKS. PERCENTAGE MORTALITY FROM INFLUENZA AT DIFFERENT AGES.

(*C*) COPENHAGEN, 1892.—1ST 3 WEEKS. PERCENTAGE OF INFLUENZA CASES AT DIFFERENT AGES.

Registrar-General's 'Weekly Returns,' 1890, 1891.

'Veröffentlichungen d. Statistisch. Amts d. Stadt Berlin,' 1891.

'Veckoöfversigt af Stockholms sanitära statistik,' 1892.

'Bulletin Hebdomadaire,' Paris, 1892.

'Ugentlig Oversigt over Fødsler, Sygdomme og Dødsfald,' Kjøbenhavn, 1892.

LIST OF PLATES

WITH THE CORRESPONDING TABLES

Fig. 1. London, 1890.
Mortality from Influenza and other Diseases, during the first 22 weeks of the year. The curves express percentage deviations from the mean of ten years. (Tables I, IX.)

N.B.—Data for the last 7 weeks of 1889 are included in Fig. 1, though not given in the Tables.

,, 2. London, 1847, 1848.
Mortality from Influenza and other Diseases during the last 14 weeks of 1847 and the first 19 weeks of 1848. (Tables II, VIII.)

,, 3. Paris, 1889, 1890.
Mortality from Influenza and other Diseases. (Tables III, VI, VII.)

,, 4. Berlin, 1889, 1890.
Mortality from Influenza and other Diseases. (Table IV.)

,, 5. London, 1890. Paris and Berlin, 1889, 1890.
Temperature, Rainfall, Humidity of Air, Force and Direction of Wind, and Mortality from Influenza. (Tables III, IV, V.)

,, 6. London, 1888, 1889, 1890.
Percentage Mortality from Influenza and other Diseases at different periods of life. (Table X.)

,, 7. Paris, 1889, 1890.
The first weeks of 1890 compared with those of 1889 in respect of the Mortality at different Ages. (Table XI.)

,, 8. London, 1847, 1848, 1888, 1889, 1890.
Periods of prevalent Influenza (in 1847–48, 1890) compared with corresponding periods of ordinary years (1888–1889) in respect of Mortality from various Causes at different Ages. (Table XII.)

,, 9. London, 1891.
Mortality from Influenza and other Diseases during the first 34 weeks of the year. Percentage deviations from the mean of ten years. (Tables XIII, XIV.)

,, 10. London, 1891.
Temperature, Rainfall, Humidity of Air, Force and Direction of Wind, and Mortality from Influenza. (Table XIII.)

,, 11. London, 1891.
Percentage Mortality from Influenza and other Diseases during the ten weeks, 18th–27th, at different periods of life. (Table XV.)

EPIDEMIC INFLUENZA.

I.

THE EPIDEMICS OF 1847, 1848, AND 1889, 1890.

1. The General Course of the Outbreak.

The epidemic of 1890 in London.—During the first twenty-two weeks of 1890, 599 deaths were returned in London as primarily due to influenza. Large as these numbers may seem, there can be no doubt that the epidemic of that year was really answerable for a far greater mortality than this; and it will presently be shown that the tale of victims direct or indirect of this destructive malady cannot have fallen far short of 2800 for London alone[1].

The rise and progress of the epidemic in London are shown in Table I, which gives the number of fatal cases week by week for the first five months of the year, distributed into groups corresponding to the seven periods of life[2] which are adopted for statistical purposes in the English Official Returns issued by the Registrar-General at Somerset House; and compared, as to the total number for each week, with the average number of deaths for the corresponding week in the ten years 1879–1888, corrected for increase of population.

With regard to the general progress of the epidemic, the most noticeable features disclosed by the figures in the 'All Ages'

[1] See below, p. 13.

[2] The 'Seven Ages' of the Registrar-General are as follows;—(1) Infancy, 0–1 (2) Childhood, 1–5; (3) Youth, 5–20; (4) Maturity, 20–40; (5) Middle age, 40–60; (6) Old age, 60–80; (7) Extreme old age, 80–.

column of the Table are, (1) the sudden rise of the disease, as measured by the number of fatal cases, from zero at the beginning of the year to the maximum in the third week; (2) the more gradual but still rapid fall during the first part of the period of declension (fourth to sixth weeks); and (3) the final disappearance of the epidemic by smaller and smaller weekly decrements with occasional fluctuations. These points are well marked in Fig. 1, where the blue curve represents in graphic form the weekly incidence of fatal influenza as given in the Table before us; the abscissæ marking weeks, and the ordinates showing the actual number of fatal cases. The peculiarities just mentioned are characteristic of epidemics in general; the present curve differing from those of most other epidemic diseases only in the extreme steepness of its rise and the short duration of the most fatal period.

The epidemic of 1847 in London. — The great outbreak of influenza that took place in this country towards the end of the year 1847 was the first of which full and accurate statistics have been preserved. A comparison of the London figures for 1847 and 1848, given in Table II and graphically represented in Fig. 2, with those of 1890 already under consideration, shows conclusively that the same general features characterised both epidemics, the progress of the first of which is thus briefly described by Dr. Farr in the Registrar-General's Annual Report for 1847:—

> 'The epidemic carried off more than 5000 souls over and above the mortality of the season. The epidemic attained the greatest intensity in the second week of its course; raged with nearly equal violence through the *third* week; declined in the *fourth*, and then partly subsided; but the temperature falling, the mortality remained high not only through December, but through the month of January.' Report, p. xxviii.

Here we have the same intensification of the typical epidemic character, the same steepness of rise, the same shortness of maximum duration, the same shelving and fluctuating fall.

The epidemic of 1889, 1890 in Paris and Berlin.—Nor are these marks peculiar to the course of the epidemic in England. The official statistics for 1889 and 1890 of Paris[1] and Berlin[2]

[1] 'Bulletin Hebdomadaire de Statistique Municipale.' Paris, 1890.

[2] 'Veröffentlichungen des Statistischen Amts der Stadt Berlin,' 1890.

point in the same direction with those of London, though dealing with smaller numbers and recorded with less completeness and system. This will be clear from Tables III, IV, and Figs. 3, 4, for the materials used in which I am indebted to the courtesy of the authorities of the Registrar-General's Department at Somerset House. By the permission of these gentlemen I have been enabled to spend some time in the Statistical Department, investigating, amongst other matters, the official returns of foreign cities, which under ordinary circumstances are somewhat difficult of access. The results of this enquiry are less full than might have been expected; the fact being that most of the foreign official publications dealing with vital statistics in point of completeness compare very unfavourably with our own, upon which the activity of a succession of sanitary reformers has had a marked and wholesome effect. The returns from Vienna[1], St. Petersburg[2], Brussels[3] and many other cities have been examined, but none contains the information required for the present purpose. For accurate statistics of the Continental epidemic we can only turn to Paris and Berlin, whose experience, so far as it is recorded, resembles our own.

The course of influenza, then, is that of a typical epidemic disease, but it possesses the distinctive epidemic features in an unusually marked degree.

2. The Influence of Meteorological Conditions.

The statistics of the outbreak of influenza in 1889 and 1890 in London, Paris and Berlin do not seem to favour the supposition so often advanced that any direct relation exists between meteorological conditions and the progress of the epidemic. Facts bearing on this

[1] 'Mittheilungen des statistischen Departements des Wiener Magistrates. Wochenbericht.' Vienna, 1890.

[2] 'Bulletin Hebdomadaire de la Section de la Statistique Municipale.' St. Pétersbourg, 1890.

[3] 'Ville de Bruxelles. Service d'Hygiène—Statistique sanitaire—Bulletin Hebdomadaire de Statistique Démographique et Médicale.' Brussels, 1890.

part of the subject are collected in Tables III, IV, V and Fig. 5, which give the influenza mortality and the temperature of the air for London, Paris and Berlin; together with the rainfall and the direction of the prevalent winds in the case of the two first-named cities, and also the amount of wind and humidity of the atmosphere for London.

London, 1890.—In London the epidemic attained its height and fell back to a comparatively low level during the prevalence of strong south-westerly winds and mild weather. With the sixth week of the year and of the epidemic began a cold period of east and north-east winds which lasted for five weeks, without however checking the fall in the number of deaths primarily referred to influenza.

Paris, 1889, 1890.—In Paris, on the other hand, the rise coincided with a change in the direction of the wind from south-west to north and north-east, and a fall of mean temperature from 2·6° C above to 2·2° C below the normal. The decline of the influenza was accompanied by west and south-west winds and a temperature considerably above the normal. The meteorological conditions were therefore widely different from those prevailing during the height of the mortality in London, yet no conspicuous difference in the course of the epidemic can be perceived.

Berlin, 1889, 1890.—In Berlin the mortality and the temperature on the whole rose and fell together. The spread of influenza began in weather that though gradually increasing in warmth was cold for the time of year. The height of the mortality having been reached under these conditions, the temperature suddenly ran up; the epidemic at the same time began slowly to decline. This it continued to do in a gradual and uniform manner, apparently unaffected by the variation in the temperature, which underwent a tolerably uniform passage, though with rapid falls in the fourth and fifth weeks of 1890, from 4·9° C above to about 4·3° C below the normal for that period of the year. The influenza subsidence curve presents no marked features, beyond the fact that its fall is somewhat more gradual and prolonged than usual. It should of course be remembered that we are here dealing with comparatively

small numbers, the maximum mortality in Berlin from influenza for one week being only twenty-six.

Effect on complications.—It is of course well known that the fatality from bronchitis, pneumonia, and other diseases of the respiratory system is very largely influenced by meteorological conditions, and there is every reason to suppose that this is the case when these ailments occur as complications of influenza no less than when they arise in other ways. The charts at present before us supply illustrations of the directness and importance of this relation. An instance occurs in the rise of London mortality from these diseases in the fifteenth and sixteenth weeks of 1890 (see Fig. 1), which followed immediately upon a spell of cold weather and east winds. A large amount of the bronchitis and pneumonia then existing was undoubtedly due to the still prevalent influenza, and indeed the atmospheric conditions would seem from the chart before us to have been not without effect on the primary influenza itself. But this latter effect is late in appearing, small and transient, forming but a slight interruption to the downward course of the epidemic.

On the whole, though no one would deny the influence of meteorological conditions on the course of the disease in individual cases, it seems certain that the incidence and progress of the epidemic in a given locality are very little controlled by temperature, rainfall, or prevalent winds.

3. The Effect of Epidemic Influenza on the Mortality from other Diseases.

It is well known that the bulk of the marked rise in the death-rate, which invariably accompanies an outbreak of this disease, is due not to fatal cases referred to influenza as the primary cause of death, but to the largely increased number of deaths attributed to other diseases, particularly those of the respiratory organs.

London, 1890.—Thus, of the 2800 deaths which on a moderate computation resulted from the epidemic of 1890 in London, not more than 600 were returned as directly due to influenza.

Paris, 1889, 1890.—In Paris, where Dr. Jacques Bertillon[1], Chef des Travaux de la Statistique Municipale, estimates the total number of deaths due directly or indirectly to the influenza at about 5000, the number recorded for influenza alone is only 216. It is true that the figures for the latter portion of the period of decline are not given in the official statement; but we should probably be above the mark if we put the whole number of deaths so returned in Paris at 300.

It would seem then desirable to enquire (*a*) what is the nature of the relation that exists between the mortality from influenza and that from other diseases; (*b*) what are the diseases among which the relation obtains; (*c*) in what proportion is each disease affected, and what share does each take in the general rise of mortality?

(*a*) What is the nature of the relation?

Twofold relation to other Diseases.—It is obvious that there are two ways in which the mortality from a given disease may be affected by influenza. In the first place, influenza may attack patients already suffering from a disease which we will call 'A,' undoubtedly diminishing their chances of recovery, and leading to an increased mortality from that particular cause. In the second place the disease 'A' may bear to influenza the relation of a complication or sequela, and may in this way become the immediate cause of death in many persons who would have escaped 'A' altogether, but for the primary attack of influenza. Strictly speaking, the first class of cases alone ought to be returned under the head of 'A,' that being the primary cause of death; the second class of cases belongs properly to influenza, and not to the sequela or complication. This is the method of registration now pursued in the Registrar-General's department, though it was not so in 1847, and if the system could be perfectly carried out in every particular, it is evident that the only diseases showing an increase during the prevalence of the influenza would be those holding the first kind of relation to the epidemic, those namely that are capable of being aggravated by its presence. Deaths from diseases holding to influenza the second kind of relation, that of complication or sequela, would swell

[1] 'Bulletin Hebdom.' Paris, 1890, fourth week.

the list not of those diseases but of influenza itself[1]. It is impossible, however, to believe that the rise observed for instance in fatal bronchitis and pneumonia during the progress of epidemic influenza represents merely the ordinary amount of these diseases present in the community, aggravated in certain cases by the incidence of the epidemic. Experience and *a priori* considerations on the contrary both point to the fact that a large number of the deaths referred to these two diseases are really due to primary influenza which passed unrecognised, or at any rate was not returned as the cause of death; the gravity of the sequela having diverted attention from the original complaint. This is particularly likely to happen at the beginning of an epidemic; the true diagnosis of the first cases that herald the coming devastation being often made only in the light of subsequent events[2]. These considerations serve to illustrate the extreme difficulty of gaining much light from statistics on the comparative importance of the two kinds of relation to influenza in the case of any given disease. Such an estimate must at present rest mainly on non-statistical evidence.

(*b*) What are the diseases with which this relation subsists?

Diseases affected by the presence of Influenza.—Among the disorders the mortality from which is carried up with the rise of influenza, those of the respiratory system, especially bronchitis and pneumonia, hold the leading place. Phthisis also and diseases of the organs of circulation are largely affected, while the number of deaths attributed simply to old age undergoes a marked increase. Dr. Farr has pointed out that the epidemic of 1847, besides being 'fatal to the asthmatic,' caused a rise in whooping-cough, measles and typhus[3]. The last-named disease has now ceased to be of importance as a cause of death in this country. Both measles and scarlet fever remained at a low figure during the course of the epidemic of 1890, and the one zymotic disease

[1] See Registrar-General's 'Weekly Returns,' 1890, p. 12; and compare Registrar-General's 'Annual Report,' 1847, p. xxix.

[2] For instances, see Report by Dr. J. Ogle, included by Dr. West in his Paper on the Influenza Epidemic of 1890. 'St. Bartholomew's Hospital Reports,' vol. xxvi. p. 217. See also ibid. p. 198.

[3] Registrar-General's 'Annual Report,' 1847, p. xxviii.

which then showed a marked rise coincident with the invasion of influenza was whooping-cough; recent experience in this respect thus confirming that of 1847. 'Asthma' has no longer a separate existence as a cause of death in our returns. It has been asserted that the prevalence of influenza has at least in some cases led to a large increase in the number of deaths due to premature birth. Statistics of the epidemic of 1890 in London lend some slight support to this statement[1]; on the other hand Dr. West writes from his own observation of the same epidemic, that 'upon pregnancy influenza has had no special influence; even when the fever was high no trouble followed. Parturition has occurred normally, and without any misadventure to mother or child[2].' It is noticeable that accidents of childbirth never once rose above the average during the first nine weeks of 1890.

Full statistics relating to the dependence of most of these causes of death upon influenza are given in Tables VI, VII for Paris, Table IV for Berlin, and Tables VIII, IX for the London epidemics of 1847 and 1890. The most important of the same facts are represented in a graphic form by Figs. 1, 2, 3, 4 (the data for which have been derived and calculated from the Tables). It should be noticed that, wherever possible, the curves represent not the actual number of deaths, but the deviation (whether by way of excess or defect) from a mean, this being necessary in order to provide against the possibility in the case of any disease of mistaking what may be a perfectly regular rise or fall, dependent on the time of year, for an exceptional increase or decrease in its mortality. The deviations have also been calculated as percentages, with the object of making the fluctuations in the various diseases more conveniently comparable with one another. If the deviations were simply expressed numerically, the great differences between various diseases with respect to the numbers affected would be a source of difficulty both in comparison and in representation.

[1] See Table IX.

[2] 'St. Bartholomew's Hospital Reports,' vol. xxvi. p. 203. See, on the other side, 'Annual Report on the Health of the Borough of Ramsgate for the Year 1890,' by Dr. Styan, Medical Officer of Health, p. 3.

The means, it should be said, differ in different cases, being in the instance of the London epidemic of 1890 the mean of the corresponding weeks of the last ten years, corrected for increase of population; in that of the Paris epidemic of 1890 the mean of the last five years. In the case of the epidemic of 1847 the only mean available is a corrected weekly average of five years calculated for each quarter, but not for separate weeks. The recent London figures are obviously the most valuable. But even here it must not be forgotten that certain of the figures are liable to the 'fallacy of small numbers.'

It is clear that the causes of death which have been mentioned will fall more or less naturally into two groups, according to the predominance of one or other kind of their twofold relation to influenza. Thus the additional fatal cases of diseases of the organs of circulation are plainly due to the aggravation by influenza of the condition of patients suffering from these disorders, who are placed specially at a disadvantage in resisting an attack of the epidemic; the same of course holds good of 'old age.' The increased mortality from phthisis falls mainly into this group [1], though, as pointed out by Dr. West [2], phthisis is also to be reckoned among the sequelæ of influenza, 'so that we may fairly expect an increase in the mortality from phthisis in the months to follow.' The rise in fatal cases of whooping-cough, supposing its relation to influenza to be real and not merely apparent, belongs to the same category. On the other hand, bronchitis, pneumonia and respiratory diseases generally, though of course capable even in a special way of being aggravated by influenza, are mainly important as complications.

The causes of death that have been mentioned may accordingly be arranged as follows:—

A. Causes that influenza complicates—

1. Diseases of the organs of respiration;
2. Diseases of the organs of circulation;
3. Phthisis;

[1] 'St. Bartholomew's Hospital Reports,' vol. xxvi. p. 201.

[2] Ibid. p. 209.

4. Old age;
5. Whooping-cough.

B. Causes that complicate influenza—

1. Diseases of the organs of respiration, especially
   a. Bronchitis,
   b. Pneumonia;
2. Phthisis.

On a comparison of the graphic records of four epidemics presented in Figs. 1–4, the following facts become apparent:—(1) The outbreak of influenza is usually heralded by a sudden increase in the mortality from diseases of the respiratory and circulatory systems sufficiently marked to produce a decided impression on the 'all causes' curve. This pronounced rise takes place in all, but notably in pneumonia, before the number of deaths attributed to influenza reaches large figures. This phenomenon is no doubt to be explained by the fact mentioned above, namely, that in the early stages of an epidemic many cases escape a correct diagnosis, the presence of influenza not being generally recognised until it has already made considerable progress in its work of destruction[1]. (2) Influenza reaches its maximum in the third week of what may be called its serious rise. (3) The maxima of the concomitant diseases may be reached in the second week of the influenza, and are never deferred beyond the third. Bronchitis, diseases of the organs of circulation and all causes culminate as a rule in the second week, pneumonia together with influenza in the third. Phthisis usually reaches its maximum in the third week, but in 1847 attained it in the second.

(*c*) In what proportion is each disease affected, and what is the share of each in the general mortality?

Epidemic of 1847 and 1848 in London.—In the epidemic of 1847 the most noticeable departure from the normal mortality is that shown by bronchitis, the deaths from which were in the maximum week no less than 779 per cent. above the average. Pleurisy follows with a maximum excess of 367 per cent.; asthma

[1] It is especially noteworthy that the premonitory rise of bronchitis and pneumonia in 1890 took place during a spell of weather that was unusually mild for the time of year.

with 258 per cent.; pneumonia, 181 per cent.; heart disease, 135 per cent.; phthisis, 48 per cent. The highest percentage excess reached by 'all causes' was 135. In considering the figures for this epidemic, it must be remembered that they are to a certain extent vitiated by the system that then prevailed of dividing the average for the quarter equally among its constituent weeks; the result being that the apparent departure from the mean will often give a very inexact impression of the real amount of the rise or fall. This especially applies to the mortality from bronchitis. Nevertheless, after full allowance is made for this source of error, the figures remain sufficiently striking.

While the London epidemic of 1847 is still under consideration, it should be observed that the height of the influenza maximum (374) is partly to be accounted for by the fact that in 1847 the influenza figures in the words of Dr. Farr[1], 'include nearly all the cases in which influenza was returned, whether as primary, or secondary in conjunction with other diseases.' In 1890, as already stated, only those cases are included in which influenza was returned as the primary cause. It will be seen that in Fig. 2, as indeed in all the rest, the influenza curve represents the actual weekly number of deaths. That the figures cannot be stated in the form of deviations from the average, results of course from the very pronounced epidemic character of the malady, there being practically no 'mean' for ordinary years.

Epidemic of 1890 in London.—Turning now to the epidemic of 1890 in London, we find that with regard to their maxima of deviation bronchitis and pneumonia have changed places. The latter leads with a maximum excess of 146 per cent., bronchitis comes next with 103 per cent., and the corresponding figures for diseases of the organs of circulation are 96 per cent., for phthisis 72 per cent., for 'all causes' 42 per cent. The epidemic of 1890 was far less destructive than that of 1847. The only disease that suffered a much greater increase than in 1847 was phthisis; pneumonia though higher in 1890 relatively to bronchitis, was absolutely lower than in 1847.

[1] Registrar-General's 'Annual Report,' 1847, p. xxix.

Epidemic of 1890 in Paris.—The epidemic of 1890 in Paris affected the diseases in the following order, as similarly determined by their maximum excess:—pneumonia, 509 per cent.; acute bronchitis, 221 per cent.; 'all causes,' 147 per cent.; phthisis, 144 per cent. The data for cardiac diseases and chronic bronchitis are not available, the French returns in their case giving no means. The maximum of 147 per cent. for 'all causes' is of course enormously high, corresponding in fact to a death-rate of 61·7 per 1000 per annum. That the experience of previous epidemics did not prevent the authorities in Paris from underestimating the danger of the outbreak will be evident from the following successive citations from the official 'Bulletin Hebdomadaire':—

> 'L'épidémie de grippe qui s'est répandue à Paris . . . n'a causé et ne causera certainement aucun décès. On sait en effet que cette maladie est des plus bénignes et qu'elle ne suffit dans aucun cas pour entraîner la mort.' 1889, 50th week.
>
> 'La Grippe est notée comme ayant causé 1 décès, et comme ayant aggravé l'état d'un diabétique.' 1889, 51st week.
>
> 'On doit admettre que l'épidémie a causé directement ou indirectement la mort d'environ 5000 personnes.' 1890, 4th week.

Epidemic of 1890 in Berlin.—No data exist in an available form for a similar analysis of the figures for Berlin, the official returns of which city are deficient as compared with those of Paris and London. So far as can be seen, however, the cause of death most affected by the presence of influenza was, as in the other cases, pneumonia. Special difficulties arise in the case of German statistics from the official nomenclature of diseases, which offers somewhat perplexing differences from that employed in France and England.

The foregoing considerations have reference only to the disturbance in the death-rate of each disease as measured by its maximum deviation. It will also be advisable to compare together the actual number of deaths contributed by each disease to the full roll of victims of the epidemic.

London, 1847, 1848.—The number of deaths due directly or indirectly to the London epidemic of 1847 is estimated by Dr. Farr at above 5000[1]. As far as can be ascertained from the returns,

[1] Registrar-General's 'Annual Report,' 1847, p. xxviii.

the following is an approximate statement of the share taken by each cause of death in the grand total:—influenza (primary and secondary), 1900; bronchitis, 1680; pneumonia, 825; phthisis, 220; asthma, 200 (many of these would now probably be returned as bronchitis); heart disease, 120; pleurisy, 55; total, 5000. Other causes not enumerated would no doubt take the total to somewhat above 5000, in accordance with Dr. Farr's calculation.

London, 1889, 1890.—So far as I am aware, no official estimate of the death-roll of the London epidemic of 1890 has been published. The number of deaths from 'all causes' in excess of the average during the course of the epidemic was about 2260. It appears to me, however, on taking out the separate causes of death, that this represents less than the actual number of the victims, which I should estimate at about 2800, distributed among the principal causes as follows:—bronchitis, 900; influenza (primary), 600; phthisis, 500; pneumonia, 400; diseases of organs of circulation, 300; other causes, 100; total, 2800.

Paris, 1889, 1890.—In Paris the official estimate for 1890 is 5000[1]. The following appears to me to be a tolerably exact statement of the part taken by the principal concomitant diseases:—pneumonia, 1770; phthisis, 1224; bronchitis, 940; heart disease, 550; influenza, 216; other causes, 300; total, 5000.

4. The Age-Relations of Influenza.

There is a group of important data placed within our reach by the Registrar-General's Returns which, so far as I am aware, has not yet been systematically employed in the investigation of the relation between influenza and other diseases, but which is undoubtedly capable of throwing much light on the subject. I refer to the information given as to the age-incidence of various causes of death.

Age-incidence of various Diseases.—It is of course well known that the mortality of different diseases varies greatly for different periods of life; that bronchitis, for example, finds its greatest

[1] Dr. J. Bertillon, in 'Bulletin Hebdomadaire,' 1890, fourth week.

number of victims amongst infants and the aged, pneumonia amongst children, phthisis amongst young adults. The Registrar-General's Returns, including the Weekly Returns for London, by distributing the deaths from each cause into seven groups of ages, make it possible to construct tables or diagrams of the fatality at different periods of life, which, when sufficiently large numbers are taken, are found to assume characteristic features for each separate cause of death. This will be evident from an inspection of Tables XI, and XII, in which are collected a number of statistics calculated from data of this kind, and belonging to years in which influenza was present, together with similar figures for comparison, derived from years when no epidemic of influenza occurred. Figs. 6, 7 and 8, based upon these Tables, exhibit the same facts in a striking form. In the construction of such diagrams the difficulty of course presents itself of placing side by side for comparison phenomena in which such very different numbers are concerned; thus while the weekly deaths from 'all causes' in London are numbered by thousands, those from pleurisy seldom reach tens. This difficulty is best met by expressing, in the case of any disease, the number of deaths for each period of life as proportional parts of the whole number, i.e. of the total mortality, which may be represented as uniform for all diseases. In the present instance, the total mortality of each disease is taken as 100, so that while the abscissæ of the curves represent periods of life, the ordinates stand for the percentage mortality at each period. In other words, the sum of the ordinates drawn through the seven points of the curve representing the seven ages in every case = 100. Thus the curves become readily comparable.

In Fig. 6 are given characteristic age-curves of influenza, pneumonia, bronchitis and 'all causes' for London. Each is seen to have its own special features, the constant character of which is demonstrated in the three latter cases by the addition of subsidiary curves derived from corresponding figures for other years. The curves for different years almost coincide; instances to the contrary, as will be seen, admit of explanation.

Attention has often been drawn, in this country and abroad,

to the comparative immunity enjoyed by children from fatal influenza, and the high mortality to which the disease gives rise among the middle-aged. This fact of ordinary experience is well illustrated by the influenza curve in Fig. 6, which is seen to remain low in the earlier periods of life, and to culminate decidedly in the period between 40 and 60. Pneumonia, on the other hand, has, as shown by the next curve, a high mortality for infants with a still higher mortality for children of about 3 years of age. The deaths from bronchitis, high in the first year of life, diminish during childhood and reach their acme during advanced life, between the ages of 60 and 80.

In view of these facts the question naturally suggests itself, whether, supposing a certain disease, for instance pneumonia, to be influenced by the presence of the epidemic, we should not find, on drawing the age-curve of pneumonia for the epidemic period, that an infusion of the influenza element had entered into the pneumonia curve, disturbing its normal features and impressing upon it a kind of intermediate character. There is no doubt that this on examination is found to be the case. The pneumonia age-curve for the epidemic period of influenza shows a decided approximation to the influenza type, and the same is true of the age-curve of bronchitis. This is made very apparent in the case of both diseases by the curves in Fig. 6, where the faint lines indicate the age-curve of ordinary years, the deeply-coloured lines show the corresponding curves for the period of epidemic influenza in 1890, while the pale blue lines represent the condition of things when influenza was at its maximum, i.e. the six weeks from the second to the seventh of that year. Thus both of the latter curves may be expected to contain an infusion of influenza, the pale blue in the greater measure. A comparison of the curves shows that this expectation is entirely borne out by the facts. In both pneumonia and bronchitis the disturbance due to influenza makes itself felt in the 'beating down' so to speak of the curve for the periods of infancy and childhood, and the raising of the curve for adult and middle life. The importance of this kind of evidence becomes enhanced when it is remembered that in none of the fatal cases

of these two diseases on which the curves are based was the presence of primary influenza recognised; had it been so the deaths would, under the present system of registration, have been returned as due to influenza and not to bronchitis or pneumonia as the case may be. The view has been put forward that in consequence of some unexplained connection between the two diseases, the number of deaths from idiopathic pneumonia will undergo a large increase during an epidemic of influenza, quite independently of those cases in which pneumonia appears as a complication. Thus Dr. West[1] says, 'Besides those cases which could be directly traced to influenza, pneumonia was unduly prevalent while the epidemic lasted. This association has been so generally observed as to suggest some intimate association between the two diseases.' The facts above adduced seem however to go far towards demonstrating the truth of a somewhat more definite explanation, namely, that a very large number of cases of influenza escape diagnosis, and that these cases (following their general law of age-incidence) are quite liable to be accompanied by complications. The fact of non-diagnosis is dependent no doubt on the mildness of many of the cases, the polymorphic character of the disease, and the unfamiliarity with it of most practitioners at the beginning of an epidemic. It is worthy of notice that whereas the proportion of deaths from pneumonia of those in advanced life is materially lowered by the presence of influenza, the same does not hold good of bronchitis. This seems to indicate that, as we might expect, pneumonia is relatively less prevalent than bronchitis as a complication among the old.

Paris, 1890.—The peculiar age-relations of influenza are sufficiently important to produce a marked effect even upon the age-curve of 'all causes.' Dr. Bertillon has published Tables in the Bulletin Hebdomadaire of Paris (first and second weeks, 1890), from which the first and second curves in Fig. 7 are constructed, and which are remarkable as showing the 'beating down' of the infant mortality at the time of the prevalence of influenza in Paris as compared with the mortality in adult and advanced life. Another diagram

[1] 'St. Bartholomew's Hospital Reports,' vol. xxvi. p. 202.

(third in Fig. 7) presents in graphic form the result of another computation by the same authority, showing in a most marked degree what I have called the infusion of the influenza element into the age-relations of a group comprising broncho-pneumonia, pneumonia and acute bronchitis [1].

Age-fatality in 1847 and 1848 compared with that in recent years.—In the year 1847, the system of seven ages had not yet been adopted in the Weekly Returns; the division was at that time into three [2]. The results so obtained, though of course inferior to those of the present method, are nevertheless of much importance. Thinking that it would be desirable to investigate the phenomena of the 1847 outbreak in London from the point of view of age-relations, and to compare them with the corresponding features of the epidemic of 1890, I have constructed Fig. 8, the data for which, having needed much marshalling and calculation, are collected in a condensed form in Table XII.

In Fig. 8 the first vertical column represents age-relations as derived from deaths during the last eight weeks of 1847 and the first six weeks of 1848, covering the chief period of the epidemic; the second column gives similar curves for the London epidemic of 1890; while in the third and fourth columns will be found the like curves of two ordinary years for comparison. In considering these curves it should be borne in mind that the ages as at present given neither coincide with those of 1847, nor can they be exactly calculated from them. We have now no means of ascertaining the number of deaths between the ages of 0 and 15, though we know those between 0 and 20. The nearest approximation possible under the circumstances has been made, but it must be remembered that the curves of the three latter columns will have, relatively to the former, their first point a little too high, and their central point a little too low. The ordinates drawn through the three points of the curves in Fig. 8, like those drawn through the seven points

[1] See Table XI.

[2] I.e., 0 to 15; 15 to 60; 60 and upwards. A more minute distribution into ages can be obtained in some instances (Registrar-General's 'Annual Report, 1847,' p. 304). These figures, however, are derived from the returns of the whole year taken together, and there exist no means of separating those belonging to the epidemic period.

of the curves in Fig. 6, represent percentages; that is to say, in each case their sum = 100.

Perhaps the most noticeable feature in the whole series of Fig. 8 is the difference between the two influenza curves, that of 1847 and that of 1890. This difference is probably due to the fact already mentioned, that in 1890 only primary influenza was returned as such, whereas in 1847 the returns include nearly every case in which influenza was recorded as a cause of death, whether primary or secondary. One result of this would be that in 1847 the numbers would include many cases where patients already suffering from lung diseases had succumbed to a superinduced attack of influenza; this would tend to raise the influenza mortality at both extremes of life, assimilating it to that of the common respiratory diseases. The correspondence between the influenza and bronchitis curves of 1847 is indeed worth noting; moreover it would become closer still if the figures for asthma were included under bronchitis.

Interesting results, confirmatory of those previously arrived at by a different method of mapping out the age-relations, are visible in the second column when compared with the third and fourth. The curves of pneumonia and bronchitis, especially the former, show the influenza infusion in a marked degree, the effect being in both instances to lower the relative mortality in the first and raise it in the second period. The 'all causes' curve is affected in the same way, though naturally to a less extent.

It is observable that phthisis and diseases of the circulatory system, the mortality from both of which causes is, as has been shown, greatly increased by the prevalence of influenza, do not in this Figure appear to be much disturbed in their age-relations by the epidemic. This indeed is to be expected in the case of phthisis, the age-curve of which already presents a strong likeness to that of influenza, the real difference between them, which is apparent under the present method of grouping ages, being masked by the comparative inexactness of the old system. Under the present mode of recording deaths it is seen that phthisis does in reality undergo a very slight disturbance in its age-relations from the presence of

influenza [1]. In diseases of the circulation also, the prevalence of influenza raises the fatality in the middle period above that of the third. But the slightness or absence of any disturbance is chiefly noteworthy in view of the fact that the diseases in question belong to the class of those which are liable to aggravation by influenza, but do not hold to it the relation of complications or sequelæ unless in a remote degree. Statistics thus add their testimony to the support of the opinion founded on general experience, that in the case of those enfeebled in either of these ways, an attack of influenza is of especial gravity, whatever the age of the patient.

[1] See Table X.

II.

THE EPIDEMIC OF 1891 IN LONDON.

1. The General Course of the Outbreak.

The outbreak of influenza under which many parts of England suffered during the year 1891 differed in several respects from previously recorded epidemics. Destructive as the epidemic of 1890 proved in London, it was far exceeded in fatality by that of 1891. During the first forty weeks of the year (Jan. 4–Oct. 10), 2205 deaths were referred to primary influenza in London, 2027 of which belong to the eleven weeks from April 26 to July 11.

A comparison of the progress of the epidemic in London as given in Table XIII and Fig. 9 with that of the outbreaks of 1847 and 1890, shows that the present invasion was somewhat longer in reaching its maximum than either of the others, and that its duration of highest intensity was considerably prolonged, two weeks having elapsed after the maximum was attained before the fall in the number of deaths became well marked. The descent when it did set in was unusually steep and uninterrupted.

No feature of the late epidemic is more remarkable than the time of year of its incidence. In this respect, as pointed out by Sir A. Mitchell and Dr. Buchan, in a paper read at the International Congress of Hygiene and Demography, August, 1891[1] it differs from all previous epidemics for which trustworthy weekly statistics exist. The epidemic of 1847–48 reached its height in London during the second week of December, that of 1890 during the third week of January; the epidemics in Paris and Berlin corresponding to the latter culminated during the first week of

[1] 'Influenza and Weather of London,' by Sir Arthur Mitchell, K.C.B., and Dr. Buchan.

January, 1890, and the last week of December, 1889, respectively. The maximum point of the late epidemic was reached in the third week of May.

2. The Influence of Meteorological Conditions.

As in the case of other outbreaks, it does not seem possible to trace any relation between meteorological conditions and the course of the epidemic. The following points, derived from the data collected in Table XIII and Fig. 10 seem, however, worthy of note. (1) During the first three weeks of the actual rise of the epidemic, the temperature of the air, which had for seven weeks been below the average weekly value, began to exceed that average, and did so by a larger amount every week. (2) The week of maximum intensity was nevertheless characterized by a temperature 9·2° F. below the normal. The rainfall during the same week was unusual in amount (1·17 inches), and the humidity of the air reached a comparatively high point. (3) The succeeding week showed a high degree of humidity and an abundant rainfall, the temperature rose slightly, but remained 7·6° below the normal. The mortality from influenza remained very nearly the same; as indeed it did during the next week, with a rise of temperature to 1·1° above the normal and a greatly diminished rainfall. (4) The week during which the fall became rapid was colder (4·2° below normal), much drier, with a stiff NNE. wind and no rain. (5) During the period of greatest prevalence winds were comparatively light in amount, the horizontal displacement of the air being generally below the average; while their direction having been as a rule N. and NE. during the rise of the epidemic, changed to SW. at the time of its maximum intensity, and went back again to NNE. at the beginning of its decline.

3. The Effect on the Mortality from other Diseases.

Figures relating to the dependence of the mortality from other causes on the presence of epidemic influenza are supplied for 1891 in Table XIV; which is similarly constructed to Tables VIII and

IX, except that the mortality at separate ages is not given. Figure 9 presents the more important data of the Table in a graphic form. It will be seen that, with certain exceptions, the results bear a general resemblance to those arrived at for previous epidemics. Among the causes of death whose connection with influenza is somewhat doubtful, whooping-cough again showed a tendency to rise; it stood, however, at a comparatively low figure during the maximum week of influenza. The deaths attributed to premature birth were, as in 1890, above the average, with a maximum in the fifth week of the epidemic; those due to accidents of childbirth were less markedly affected, but reached a decided maximum in the fourth week, the week in which influenza itself culminated. Enteritis and brain diseases, to which, in relation with influenza, special attention has been directed by Sir A. Mitchell and Dr. Buchan[1] in their valuable paper before cited, also rose and remained on the whole at a high level during the epidemic[2]. Enteritis, however, fell below the average in two of the weeks (fourth and sixth of the epidemic) during which influenza was at its highest. With regard to those causes of death whose relation to influenza is of a very direct kind, it is noticeable that in most cases their highest elevation was deferred beyond the usual period. Thus, while pneumonia and influenza reached their maximum together in the fourth week; 'all causes,' phthisis, and diseases of the circulatory system were not at their height until the fifth; while bronchitis and old age continued to increase in fatality up to their culminating point in the sixth week of the epidemic. The delay in the culmination of bronchitis, especially noticeable in view of the experience of other epidemics, no doubt explains the deferred maximum of 'all causes.' Not only was the fatal period of bronchitis unwontedly protracted, but its mortality underwent a far greater disturbance, as measured by departure from the mean, than in 1890; the percentage excess in the maximum

[1] 'Influenza and Weather of London.'

[2] My friend Dr. G. B. Longstaff points out that the fact of the increase of 'enteritis' unaccompanied by a corresponding increase in 'diarrhœa,' bears incidental testimony to the general accuracy of the diagnosis of causes of death furnished in the certificates received by the Registrar-General.

week being 154 as against 103. This marks a greater deviation than pneumonia underwent in 1890, when it headed the list of diseases affected by influenza. The maximum percentage departure reached by pneumonia in the present epidemic was 121 as against 146 in 1890. Diseases of the circulatory system in the 1891 epidemic reached 87, old age 74, phthisis 27, as against 96, 28, and 72 per cent. in 1890 respectively. The maximum excess attained by 'all causes' was 56 per cent. in 1891, 42 in 1890. The pneumonia curve in Fig. 9 deserves especial notice for its curious shape—its steep and sudden rise and fall, together with its lengthened period of uniform elevation, suggesting comparison with a table-land rather than, as is usual, with an isolated mountain-peak.

It is remarkable that, although the deaths primarily attributed to influenza in the epidemic of 1891 were nearly four times as many as those in the attack of 1890, the total number of victims of the epidemic of 1891 does not seem to have much exceeded double the previous figure. This fact is perhaps due to the greater ease with which, in consequence of the familiarity with the disorder now shared by most practitioners, the diagnosis of influenza is generally made; so that cases were in 1891 referred to primary influenza which would in 1890 have been returned under the head of some complication. The total number of deaths in London due to the epidemic in 1890 I estimated at 2800[1], of which 600 belonged to primary influenza. Those due to the epidemic of 1891 I should reckon at about 5800; of which 2200 are due to primary influenza, and the remainder may be distributed as follows:—bronchitis, 1300; pneumonia, 1050; diseases of the circulatory system, 600; phthisis, 175; old age, 150; other causes, 325. The comparatively low figure reached by phthisis is worthy of note.

4. The Age-Incidence of Influenza during the Epidemic of 1891.

The figures given in Table XV and graphically represented in Fig. 11, show a remarkable departure in the case of influenza from the age-incidence which characterized the epidemic of 1890. The

[1] See page 13.

mortality during the earlier periods of life remained low; but, in place of the high relative fatality between the ages of 40 and 60 which was observed in 1890, there occurred a marked preponderance of deaths between the ages of 60 and 80, so that the influenza age-curve for the epidemic period of 1891 comes to present an aspect, with the exception of its low infant mortality, closely resembling the usual age-curve of bronchitis. This accords with the fact, which appears to be one of common experience, that bronchitis as compared with pneumonia was a more frequent complication of influenza in 1891 than in 1890. The deaths, however, from pneumonia in which primary influenza was not recognised, bore, as has been seen, a higher proportion to similar deaths from bronchitis in the epidemic of 1891 than in that of 1890. It should of course be remembered that the influenza curve includes all cases in which influenza was returned as the primary cause of death, whether accompanied by complications or not. The bronchitis curve in Fig. 11 is noteworthy in that it does not show a depression in infant mortality like the corresponding bronchitis curve for the epidemic period of 1890 in Fig. 6.

To sum up the chief results of the present investigation of the last outbreak in London:—The epidemic of 1891 as compared with that of 1890 was distinguished by its much greater severity, by its comparatively slow rise, its protracted period of high intensity, and its rapid and uniform fall; by the lateness in the season of its incidence; by the high proportion which deaths referred to influenza itself bore to the total mortality due to the epidemic, and by its much greater fatality at advanced periods of life. In most of these respects it is equally distinct from the epidemic of 1847–48; and it would seem to be open to question whether the facts here adduced do not suggest the possibility of a real modification in the character of the disease.

III.

THE EPIDEMIC OF 1891, 1892 IN LONDON, PARIS, BERLIN AND OTHER CITIES.

The severe outbreak of influenza in London which forms the subject of Section II had begun, as has been seen, to decline by the end of May; and the fall in the number of fatal cases during the summer of 1891 took place with somewhat unusual rapidity. The figures remained for four or five months at a low level; nevertheless the disease did not entirely disappear. Fresh cases continued to occur, and deaths were registered as due to influenza very nearly every week. At the end of 1891 it became evident that a third wave of the epidemic was threatening London; and by the middle of January, 1892, the new onset had reached its height, influenza being more prevalent and more fatal than ever.

This latest development of the epidemic has been of a very widespread character; affecting most, if not all, of the great European towns, and not sparing any of those that suffered in 1890. In many towns it has shown greater severity than any previous outbreak belonging to the same epidemic. London, which appears to stand alone in having undergone three definite and well-marked invasions of influenza since the first appearance of the present epidemic in 1889, has been attacked with greater violence on each successive occasion. The number of deaths attributed to primary influenza, which, in the maximum week of 1890, was only 127; and in that of 1891, 319; was, in the third week of January, 1892, 504; the highest weekly total on record.

The present wave of the epidemic, though well past its height in most places, is still (February, 1892) far from having completely subsided. Some months will probably elapse before its history can be fully written. In Tables XVI–XXI, however, are brought together the most important features of the outbreak so far as it

has at present affected the cities of London, Paris, Berlin and Vienna. It is worthy of note that in the official publications of most foreign towns the data available for a history of the epidemic are in 1892 far more ample than they were two years ago; the presence of influenza has at least a beneficial effect on the activity of official statisticians. The 'Mittheilungen des Statistischen Departements des Wiener Magistrates' still contain no weekly record of deaths from influenza, but a register of cases is duly kept and published.

1. The General Course of the Outbreak.—With regard to the general progress of the epidemic, the Tables will disclose no new or exceptional features. The outbreak in all the cities referred to has run its usual course—that of an ordinary zymotic plague in its most typical and best-marked form, characterised by steepness of rise, shortness of maximum duration, and comparatively gradual fall. In this respect the London epidemic of 1892 contrasts with that of 1891, the maximum period of which was, as has been seen, of a duration quite unusual for these epidemics [1]. The general character of the influenza mortality curve undoubtedly favours the opinion that influenza is a zymotic disease.

2. The Influence of Meteorological Conditions.—Not only in the general features of the outbreak, but also in the time of year of its occurrence, the epidemic now under consideration has approached the normal character more closely than did that of the spring of 1891. The maximum week in London was, as in 1890, the third week of the year. In Paris and Vienna it was the second, in Brussels apparently the second; in Berlin, however, the maximum was reached in the first week of December, 1891, and by the beginning of 1892 the mortality was well on its downward course. As in former epidemics, it does not appear that meteorological conditions have exercised much control over the course of the invasion; it is, however, worthy of note that during the rise of mortality in London the temperature of the air was generally below the average, and during its fall generally above it. The week of maximum fatality immediately followed

[1] See p. 20.

one in which the average temperature was 7·3° F. below the normal. The turn of the tide in influenza mortality coincided with a change in the general direction of the wind from NE. to SW., and an increase in the horizontal movement of the air from 959 miles below to 716 miles above the weekly average. The maximum week in Paris was cold, with light and variable winds and no rain.

3. The Effect on the Mortality from other Diseases.—It is of course not yet possible to estimate the total number of deaths caused by the present recrudescence of influenza, or to say in what degree the various diseases affected by its prevalence will contribute to the general mortality. Tables XVII, XIX, XX and XXI are necessarily presented in a somewhat imperfect form; an examination of them will nevertheless disclose many points of interest. It is clear that in London bronchitis will, as in 1891, show a greater departure from its usual rate of fatality than pneumonia. The nomenclature of diseases of the respiratory system (amongst others) puts difficulties in the way of comparing the results from foreign cities; it is obvious, for example, that the 'acute bronchitis' of Berlin, with its usual weekly average of two deaths in a population of 1,600,000, cannot be the same disease as the 'acute bronchitis' of Paris, with its average of about 30 in a population of 2,260,000. There is no doubt, however, of the broad fact that the mortality from diseases of the respiratory system has been everywhere specially and profoundly modified by the epidemic, as in former invasions. The usual rise in the fatality from phthisis, from diseases of the circulatory system, and from 'old age' is also very evident; moreover, the figures for 1892 tend strongly to confirm former observations with reference to the relation with the epidemic of whooping-cough, enteritis, diseases of the nervous system and disturbances of the puerperal condition affecting both mother and child.

4. The Epidemic in its relation to Age and Sex.—For a complete statement of the age-incidence of the present development of the epidemic, it will be necessary to wait until the mortality has subsided. So far, however, as results are at present attainable there is no doubt that, at least in London, the present outbreak

resembles that of the spring of 1891 and contrasts with that of 1890 in its great comparative fatality at advanced periods of life[1]. As in all known influenza epidemics, the mortality in infancy and childhood has been low.

It has been lately stated by Dr. Ruhemann[2] that the present epidemic in Berlin has been characterized by the great severity of its incidence upon women and children as compared with men. This assertion, based by Ruhemann only upon personal observation, is confirmed, so far as regards sex-incidence, by the testimony of statistics. During the month of November, 1891, of the 119 fatal cases of influenza recorded in Berlin, 42 were males and 77 females. This is not in accordance with the usual distribution of influenza between the sexes. In 1890, for example, Dr. Bertillon showed from statistics that in Paris the mortality from influenza was far higher among men than among women; and in 1892, though the disparity in numbers is considerably reduced, the deaths of males are still in a majority. In the first three weeks of 1892, 145 deaths were referred in Paris to influenza; of these 75 were of men and 70 of women. Of the 4523 deaths directly ascribed to influenza in England and Wales during the year 1890, 2415 were of men and 2108 of women[3]. It would appear, however, that Berlin does not stand alone in the exceptional severity among women of the present epidemic. In Stockholm[4], of 137 fatal cases during the first two weeks of 1892, 43 were male and 94 female; while in Copenhagen[5] 2445 cases of sickness from influenza were

[1] The high relative fatality of persons in early middle age during the epidemic of 1890 may be due to the fact that the necessity for most careful precautions on the part of those attacked had not at that time so forcibly impressed itself on the public mind as it has since. Persons between the ages of 30 and 50 are less likely to avoid exposure and more reluctant to lie up than most of those who have reached a more advanced period of life. A like cause may explain the high relative fatality among men as compared with women in the 1890 epidemic in Paris, as suggested by Dr. Bertillon in the 'Bulletin Hebdomadaire,' 1890, 1st week.

[2] 'Ueber die zur Zeit in Berlin herrschende Influenza-epidemie,' von Dr. Ruhemann in Berlin; 'Deutsche Medicinische Wochenschrift,' No. 4, Jan. 28, 1892, p. 74.

[3] Registrar-General's 'Annual Report, 1890,' pp. xiii, 112.

[4] 'Veckoöfversigt af Stockholms sanitära statistik,' 1892.

[5] 'Ugentlig Oversigt over Fødsler, Sygdomme og Dødsfald,' Kjøbenhavn, 1892. The cases are those of persons above the age of 15, the sex-distribution for earlier ages not being given in the Copenhagen returns.

reported during the first three weeks of 1892, of whom 961 were men and 1484 were women. With regard to Ruhemann's contention as to the comparative severity of incidence upon infants and children, the comparison given in Table XXII between the percentage mortality from influenza at different ages for various epidemic periods does not seem to show that the figures for the present epidemic in Berlin are in this respect at all exceptional. The corresponding figures for Paris, on the other hand, deserve notice on account of the extreme slightness of the infant mortality shown by them. It must of course be remembered that in nearly every instance the only numbers available are those of deaths, not of cases; and it is possible for a disease to be most prevalent at one age and most fatal at another. In the majority of the returns the fatal cases are the only ones recorded: the figures, however, in Table XXII for Copenhagen are those of persons ill—not of deaths. The official grouping of ages differs in Copenhagen from that more usually employed, but the first two periods of life coincide with our own, and it is seen that the percentage of cases for infants is low, while that for early childhood is somewhat high, as compared with the records of deaths derived from other towns. These facts may indicate that influenza is less likely to attack infants than young children, but is more apt to prove fatal when it does so. The numbers at present available are, however, too small to justify a statistician in coming to a positive conclusion on this part of the subject.

Speaking generally, the wave of the epidemic now passing has been of a more normal character than that of the earlier part of 1891, from which it has been distinguished no less by its undelayed and continuous fall than by the season of its occurrence and the very much wider range of its activity. In the distribution of fatal cases according to sex it has shown in some places peculiar features. In the relation of its incidence to the age of the patient it appears to correspond more closely with the last epidemic than with that of 1890.

TABLE I. London, 1890.

Mortality from Influenza at Different Ages.

Week.		Ages.							All Ages.	
		0–1	1–5	5–20	20–40	40–60	60–80	80–	1890.	Corrected Average of 10 years, 1879–1888.
Jan.	1	–	–	–	–	3	1	–	4	0·4
	2	2	1	1	24	28	9	2	67	0·2
	3	7	4	9	34	46	26	1	127	0·0
	4	4	4	3	30	40	22	2	105	0·3
Feb.	5	3	4	4	18	30	15	1	75	0·3
	6	1	3	3	7	11	10	3	38	0·3
	7	4	3	–	3	12	7	1	30	0·2
	8	3	–	2	5	5	7	2	24	0·2
March	9	1	1	–	6	4	10	1	23	0·3
	10	2	2	1	4	7	8	–	24	0·1
	11	1	2	2	1	2	3	–	11	0·1
	12	1	–	1	2	6	6	1	17	0·1
April	13	–	–	–	4	8	1	–	13	0·0
	14	–	–	1	4	2	3	–	10	0·1
	15	–	–	–	2	3	1	1	7	0·0
	16	–	1	2	1	1	3	1	9	0·1
	17	–	–	–	–	5	1	–	6	0·4
May	18	–	–	–	1	–	1	–	2	0·1
	19	–	–	–	1	1	1	–	3	0·0
	20	–	–	–	–	–	2	–	2	0·0
	21	–	–	–	–	–	1	–	1	0·0
J	22	–	–	–	1	–	–	–	1	0·0
Total		29	25	29	148	214	138	16	599	3·2
Average . . .		1·3	1·1	1·3	6·7	9·7	6·3	0·7	27·2	0·15
Per cent. of 'All Ages.'		5	4	5	25	36	23	3	100	

TABLE II. London, 1847, 1848.

Mortality from Influenza at Different Ages.

Week.		Ages.			All Ages.	
		0–15	15–60	60–	1847, 1848.	Corrected weekly Average of 5 years.
	1847. 40	–	1	1	2	3
Oct.	41	1	–	–	1	3
	42	–	–	–	–	3
	43	–	–	–	–	3
	44	–	–	1	1	3
Nov.	45	–	–	2	2	3
	46	3	1	–	4	3
	47	3	–	1	4	3
	48	3	10	23	36	3
Dec.	49	38	48	112	198	3
	50	80	113	181	374	3
	51	75	67	128	270	3
	52	37	41	64	142	3
	53	47	35	45	127	3
Jan.	1848. 1	42	34	26	102	3
	2	39	32	31	102	3
	3	24	30	35	89	3
	4	12	19	25	56	3
Feb.	5	9	19	31	59	3
	6	12	15	20	47	3
	7	8	7	12	27	3
	8	13	11	9	33	3
March	9	5	4	9	18	3
	10	3	3	5	11	3
	11	3	4	3	10	3
	12	6	3	7	16	3
	13	3	2	3	8	3
April	14	2	2	2	6	2
	15	3	3	3	9	2
	16	2	2	7	11	2
	17	1	2	4	7	2
May	18	2	1	–	3	2
	19	–	–	–	–	2
Total		476	509	790	1775	
Average . . .		14·9	15·9	24·7	55·5	
Per cent. of 'All Ages.'		27	29	44	100	

TABLE III. Paris, 1889, 1890.

Temperature, Rainfall, &c., and Mortality from Influenza.

Week.			Deaths from Influenza.	Temperature of Air. Mean Daily Value. (Weekly Average.)	Deviation of Temperature from Normal.	Rainfall.	Prevalent Wind.
				°C.	°C.	mm.	
Oct.	1889.	42		10·6	−0·3	6·8	S. SW.
		43		9·6	−0·3	18·4	SSW. NE.
Nov.		44		10·6	+1·9	11·9	S. SW.
		45		9·7	+2·0	14·4	V.
		46		8·3	+1·7	0·1	N. NE—SSE.
		47		4·1	−1·6	0·3	ESE.
		48		4·7	0·0	13·8 (snow)	V.
Dec.		49		−1·3	−5·2	0·9	NE.—SSW.
		50		0·8	−2·4	21·3	V.
		51	1	0·8	−2·0	0·2	S.
		52	22	5·1	+2·6	10·7	SW.—N.
Jan.	1890.	1	89	0·2	−2·2	0·8	E. NE.
		2	66	7·0	+4·7	7·0	S. SW.
		3	38	6·3	+4·1	1·0	S. SW.
		4		8·1	+5·6	30·6	SW.
		5		6·4	+3·5	12·8	V.
Feb.		6		0·8	−2·4	0·2	NE.
		7		2·9	−1·1	0·3	ENE. S.
		8		5·8	+1·2	3·8	E. NE.
		9		1·7	−3·6	0·0	NE. N.
March		10		2·3	−3·7	3·1	NE. W.
		11		8·7	+2·0	4·4	W. S.
		12		7·9	+0·6	14·4	V.
		13		10·8	+2·8	6·8	SSW.
April		14		9·6	+0·6	0·0	NE.
		15		6·9	−2·6	4·7	W. NW.
		16		10·2	0·0	16·8	V.
		17		9·9	−1·0	23·3	WSW.

TABLE IV. Berlin, 1889, 1890.

Temperature, and Mortality from Influenza and other Diseases.

Week.			Weekly Average. Temperature of Air.	Deviation of Temperature from Mean of 30 years.	Deaths from Influenza.	Deaths from Acute Bronchitis.	Deaths from Chronic Bronchitis.	Deaths from Pneumonia.	Deaths from Pulmonary Phthisis.	Deaths from All Causes.
			°C.	°C.						
Dec.	1889.	50	0·7	−0·4	2	1	23	70	121	768
		51	0·9	+1·0	10	3	32	126	131	927
		52	1·2	−0·3	26	2	55	150	182	1069
Jan.	1890.	1	4·0	+4·9	21	6	47	119	159	918
		2	3·0	+3·8	22	1	32	84	138	763
		3	3·4	+2·8	13	–	32	77	102	669
		4	1·4	+1·2	13	1	14	47	101	670
Feb.		5	−1·2	−2·0	8	3	19	45	110	659
		6	−1·9	−1·8	8	2	15	50	107	630
		7	−1·3	−2·6	1	–	24	48	108	651
		8	−1·8	−3·7	2	2	27	52	96	650
March		9	−1·6	−4·3	3	–	20	55	93	645
		10								
		11			1	4	28	64	106	685
		12			2	3	16	61	95	605
		13			–	2	13	52	92	639

TABLE V. London, 1890.

Temperature, Rainfall, &c., and Mortality from Influenza.

Week.			Deaths from Influenza.	Temperature of Air.		Rainfall in Inches.	Direction of Prevalent Wind.	Horizontal Displacement of Air (in Miles). Departure from Mean of 16 years.	Degree of Humidity. (Saturation = 100.)
				Mean Daily. Value. Weekly Average.	Departure from Mean of 20 years.				
				°F.	°F.				
Jan.	1890.	1	4	32·8	−5·3	0·11	V.	−1189	97
		2	67	47·6	+9·9	0·40	SSW. & SW.	+ 933	89
		3	127	45·5	+7·0	0·13	SW.	+ 408	86
		4	105	42·7	+3·3	0·77	SW.	+1225	84
Feb.		5	75	42·9	+2·7	0·73	SW. & NW.	–	90
		6	38	37·1	−3·3	0·05	ENE. & NNE.	− 922	89
		7	30	35·9	−3·1	0·88	E. & ESE.	− 527	87
		8	24	39·4	+0·3	0·04	E.	− 405	89
March		9	23	35·4	−4·6	0·22	NE. & E.	− 116	87
		10	24	36·4	−4·2	0·33	NE. & SW.	+ 660	69
		11	11	45·3	+4·5	0·24	SW.	+ 88	79
		12	17	43·3	+1·9	0·81	SW.	− 173	82
April		13	13	49·0	+6·3	0·41	SSW. & WSW.	+ 204	84
		14	10	43·8	−1·8	0·00	NE. & ENE.	− 579	72
		15	7	43·2	−3·6	0·29	SW. NW. & N.	+ 44	72
		16	9	46·1	−1·5	0·38	NE. & ENE.	+ 548	81
		17	6	47·1	−1·2	1·00	SW.	+ 53	82
May		18	2	50·7	+2·0	0·07	V.	− 415	67
		19	3	52·4	+2·1	0·56	V.	− 445	80
		20	2	55·3	+2·8	0·56	WSW.	+ 208	69
J.		21	1	58·3	+3·4	0·14	ENE. & SSW.	− 15	65
		22	1	54·0	−2·5	0·07	NE. & NNW.	+ 481	65

TABLE VI. Paris, 1889, 1890.

Mortality from Various Diseases.

Week.		Phthisis.	Mean of corresponding week of 5 years.	Departure from Mean.		Organic Disease of Heart.	Mean (5 years).	Departure from Mean.		Acute Bronchitis.	Mean (5 years).	Departure from Mean.		Influenza.
				Numerical.	Per cent.			Numerical.	Per cent.			Numerical.	Per cent.	
	1889.													
Oct.	41	194				50	No	Means	given.	23				
	42	193	195	− 2	1	52				21	22	− 1	5	
	43	206	195	+ 11	6	53				23	21	+ 2	10	
Nov.	44	194	200	− 6	3	57				21	23	− 2	9	
	45	220	190	+ 30	16	53				17	[24]	− 7	29	
	46	179	179	0	0	49				29	25	+ 4	16	
	47	222	195	+ 27	14	76				41	29	+12	41	
Dec.	48	192	201	− 9	4	65				46	27	+19	70	
	49	206	177	+ 29	16	61				60	36	+24	67	
	50	201	174	+ 27	16	79				43	34	+ 9	26	
	51	212	178	+ 34	19	105				93	39	+54	138	1
	52	421	183	+238	130	122				132	41	+91	221	22
	1890.													
Jan.	1	473	194	+279	144	116				144	49	+95	194	89
	2	351	182	+169	93	99				110	50	+60	120	66
	3	282	193	+ 89	46	78				71	42	+29	69	38
	4	257	192	+ 65	34	51				51	43	+ 8	19	
Feb.	5	239	202	+ 37	18	47				37	40	− 3	8	
	6	238	201	+ 37	18	52	57			56	40	+16	40	
	7	242	195	+ 47	24	50	64			38	36	+ 2	6	
	8	256	189	+ 67	35	82	61			56	40	+16	40	
March	9	248	210	+ 39	19	67	66			47	43	+ 4	9	
	10	250	216	+ 34	16	71	75			53	40	+13	32	
	11	236	206	+ 30	15	69	57			41	37	+ 4	11	
	12	246	211	+ 35	17	51	68			31	41	−10	24	
	13	240	211	+ 29	14	58	71			40	41	− 1	2	
April	14	207	213	− 6	3	43	62			38	39	− 1	3	
	15	232	206	+ 26	13	64	69			28	34	− 6	18	
	16	204	212	− 8	4	55	57			41	33	+ 8	24	
	17	239	209	+ 30	14	50	64			42	26	+16	62	

TABLE VII. PARIS, 1889, 1890.

Mortality from Various Diseases.

Week.		Chronic Bronchitis.	Mean (5 years).	Departure from Mean.		Broncho-Pneumonia.	Pneumonia.	Mean (5 years).	Departure from Mean.		All Causes.	Mean (5 years).	Departure from Mean.		Influenza.
				Numerical.	Per cent.				Numerical.	Per cent.			Numerical.	Per cent.	
Oct.	1889. 41	43	No	Means	given.	21	62				984				
	42	36				15	37	58	− 6	10	867	926	− 59	6	
	43	27				13	55	63	+ 5	8	922	932	− 10	1	
Nov.	44	31				14	54	58	+ 10	17	879	940	− 61	6	
	45	31				16	48	73	− 9	12	899	944	− 45	5	
	46	30				38	39	86	− 9	10	917	1004	− 87	9	
	47	36				24	27	74	− 23	31	968	1005	− 37	4	
Dec.	48	29				24	63	81	+ 6	7	1020	1021	− 1	0	
	49	46				34	67	75	+ 26	35	1091	996	+ 95	10	
	50	57				38	103	79	+ 62	78	1188	1006	+ 182	18	
	51	60				46	133	86	+ 93	108	1356	998	+ 358	36	1
	52	127				138	346	86	+ 398	463	2334	1034	+ 1300	126	22
Jan.	1890. 1	180				159	505	109	+ 555	509	2716	1101	+ 1615	147	89
	2	154				129	364	109	+ 384	352	2078	1135	+ 943	83	66
	3	95				74	187	116	+ 145	125	1493	1145	+ 348	30	38
	4	51				48	92	120	+ 20	17	1147	1131	+ 16	1	
Feb.	5	44				31	51	120	− 38	32	1046	1164	− 118	10	
	6	48	51			29	66	98	− 3	3	1067	1072	− 5	0	
	7	53	52			42	70	101	+ 11	11	1151	1107	+ 44	4	
	8	52	59			41	69	111	− 1	1	1243	1114	+ 129	12	
March	9	57	56			51	103	104	+ 50	48	1214	1139	+ 75	7	
	10	79	52			33	102	118	+ 17	14	1320	1198	+ 122	10	
	11	54	50			41	86	125	+ 2	2	1185	1166	+ 19	2	
	12	34	64			45	65	143	− 33	23	1106	1212	− 106	9	
April	13	47	51			42	76	112	+ 6	5	1167	1145	+ 22	2	
	14	43	52			40	57	119	− 22	18	1079	1144	− 65	6	
	15	59	52			35	73	109	− 1	1	1163	1120	+ 43	4	
	16	54	44			56	76	111	+ 21	19	1125	1099	+ 26	2	
	17	38	42			41	70	117	− 6	5	1130	1079	+ 51	5	

TABLE VIII. LONDON, 1847, 1848.

Mortality at Different Ages from Influenza and other Causes.

	Week.	INFLUENZA					PNEUMONIA.						
		Ages.			All Ages.	Corrected Weekly Average of 5 years.	Ages.			All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.	
		0–15	15–60	60–			0–15	15–60	60–			Numerical.	Per cent.
Oct.	1847. 40	–	1	1	2	3	35	10	2	47	109	– 62	57
	41	1	–	–	1	3	35	13	3	51	109	– 58	53
	42	–	–	–	–	3	29	9	6	44	109	– 65	60
	43	–	–	–	–	3	44	12	3	59	109	– 50	46
	44	–	–	1	1	3	50	7	5	62	109	– 47	43
	45	–	–	2	2	3	55	5	5	68	109	– 41	37
Nov.	46	3	1	–	4	3	66	7	6	79	109	– 30	28
	47	3	–	1	4	3	76	15	4	95	109	– 14	13
	48	3	10	23	36	3	137	20	13	170	109	+ 61	56
Dec.	49	38	48	112	198	3	219	56	31	306	109	+197	181
	50	80	113	181	374	3	221	44	29	294	109	+185	170
	51	75	67	128	270	3	144	34	11	189	109	+ 80	73
	52	37	41	64	142	3	107	13	11	131	109	+ 22	20
	53	47	35	45	127	3	124	15	9	148	109	+ 37	34
Jan.	1848. 1	42	34	26	102	3	109	11	5	125	100	+ 25	25
	2	39	32	31	102	3	133	16	9	158	100	+ 58	58
	3	24	30	35	89	3	105	21	11	137	100	+ 37	37
	4	12	19	25	56	3	128	25	3	157	100	+ 57	57
Feb.	5	9	19	31	59	3	110	16	10	137	100	+ 37	37
	6	12	15	20	47	3	94	25	10	129	100	+ 29	29
	7	8	7	12	27	3	81	12	3	97	100	– 3	3
	8	13	11	9	33	3	70	15	4	89	100	– 11	11
March	9	5	4	9	18	3	67	9	5	81	100	– 19	19
	10	3	3	5	11	3	60	12	–	72	100	– 28	28
	11	3	4	3	10	3	57	5	3	65	100	– 35	35
	12	6	3	7	16	3	64	13	2	79	100	– 21	21
	13	3	2	3	8	3	67	17	7	91	100	– 9	9
April	14	2	2	2	6	3	68	10	5	83	100	– 17	17
	15	3	3	3	9	2	65	11	5	81	63	+ 18	29
	16	2	2	7	11	2	58	9	2	69	63	+ 6	9
	17	1	2	4	7	2	60	9	3	72	63	+ 9	14
May	18	2	1	–	3	2	49	11	7	68	63	+ 5	8
	19	–	–	–	–	2	58	18	3	79	63	+ 16	25

TABLE VIII. (*continued*).

Week.			BRONCHITIS.							PHTHISIS.						
			Ages.			All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.		Ages.			All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.	
			0–15	15–60	60–			Numerical.	Per cent.	0–15	15–60	60–			Numerical.	Per cent.
Oct.	1847.	40	11	9	14	34	39	− 5	13	14	99	8	121	134	−13	10
		41	15	4	9	28	39	− 11	28	13	91	1	105	134	−29	22
		42	11	5	11	27	39	− 12	31	9	94	10	113	134	−21	16
		43	10	8	13	32	39	− 7	18	11	101	1	113	134	−21	16
		44	20	9	7	36	39	− 3	9	23	83	10	116	134	−18	13
Nov.		45	18	12	19	49	39	+ 10	26	15	93	10	118	134	−16	12
		46	29	8	21	58	39	+ 19	49	12	101	8	121	134	−13	10
		47	31	11	19	61	39	+ 22	56	13	87	8	108	134	−26	19
		48	80	55	61	196	39	+157	403	22	119	12	153	134	+19	14
Dec.		49	96	96	151	343	39	+304	779	21	158	19	198	134	+64	48
		50	85	83	131	299	39	+260	667	14	168	10	192	134	+58	43
		51	72	54	108	234	39	+195	500	19	122	7	148	134	+14	10
		52	37	25	45	107	39	+ 68	174	16	87	7	111	134	−23	17
		53	63	38	37	138	39	+ 99	254	20	132	4	156	134	+22	16
Jan.	1848.	1	47	28	31	106	61	+ 45	74	13	129	8	150	147	+ 3	2
		2	51	28	46	125	61	+ 64	105	15	129	10	154	147	+ 7	5
		3	42	42	54	138	61	+ 77	126	23	122	7	152	147	+ 5	3
		4	52	44	47	143	61	+ 82	134	20	144	5	169	147	+22	15
Feb.		5	42	54	61	157	61	+ 96	157	29	116	10	155	147	+ 8	5
		6	42	32	47	121	61	+ 60	98	25	115	7	147	147	0	0
		7	31	25	24	80	61	+ 19	31	16	98	5	119	147	−28	19
		8	37	28	21	86	61	+ 25	41	18	110	7	135	147	−12	8
March		9	29	16	23	68	61	+ 7	11	9	100	6	115	147	−32	22
		10	42	21	32	95	61	+ 34	56	23	108	10	141	147	− 6	4
		11	33	15	33	81	61	+ 20	33	17	125	5	148	147	+ 1	1
		12	34	18	24	76	61	+ 15	25	25	104	10	139	147	− 8	5
		13	27	14	25	66	61	+ 5	8	25	115	9	149	147	+ 2	1
April		14	24	14	22	60	61	− 1	2	15	102	9	126	147	−21	14
		15	26	13	25	64	31	+ 33	107	21	108	9	138	148	−10	7
		16	29	17	27	73	31	+ 42	135	17	113	6	136	148	−12	7
		17	22	10	17	49	31	+ 18	58	27	114	6	147	148	− 1	1
May		18	15	20	24	59	31	+ 28	90	18	116	8	142	148	− 6	3
		19	24	16	17	57	31	+ 26	84	12	101	3	117	148	−31	21

TABLE VIII. (*continued*).

Week.		PLEURISY.							ASTHMA.						
		Ages.			All Ages.	Corrected weekly average of 5 years.	Departure from Average.		Ages.			All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.	
		0–15	15–60	60–			Numerical.	Per cent.	0–15	15–60	60–			Numerical.	Per cent.
Oct.	1847. 40	–	1	1	2	3	– 1	33	–	4	4	8	24	– 16	67
	41	1	2	–	3	3	0	0	–	6	6	12	24	– 12	50
	42	1	4	1	6	3	+ 3	100	–	4	12	16	24	– 8	33
	43	1	3	–	4	3	+ 1	33	–	4	5	9	24	– 15	62
	44	–	1	–	1	3	– 2	67	1	1	7	9	24	– 15	62
Nov.	45	–	2	3	5	3	+ 2	67	–	2	12	14	24	– 10	42
	46	1	3	1	5	3	+ 2	67	–	8	10	18	24	– 6	25
	47	1	1	1	3	3	0	0	–	3	6	9	24	– 15	62
	48	–	4	–	4	3	+ 1	33	1	30	46	77	24	+ 53	221
Dec.	49	4	7	3	14	3	+ 11	367	–	33	53	86	24	+ 62	258
	50	2	12	–	14	3	+ 11	367	–	29	49	78	24	+ 54	225
	51	–	5	3	8	3	+ 5	167	–	19	33	52	24	+ 28	117
	52	–	2	–	2	3	– 1	33	–	7	7	14	24	– 10	42
	53	1	3	1	5	3	+ 2	67	–	12	14	26	24	+ 2	28
Jan.	1848. 1	1	4	5	10	3	+ 7	233	–	8	18	26	40	– 14	35
	2	2	2	1	5	3	+ 2	67	1	16	17	34	40	– 6	15
	3	2	2	–	4	3	+ 1	33	1	26	17	44	40	+ 4	10
Feb.	4	–	2	1	3	3	0	0	–	12	14	26	40	– 14	35
	5	1	5	–	5	3	+ 2	67	–	16	27	43	40	+ 3	8
	6	3	1	1	5	3	+ 2	67	2	16	22	40	40	0	0
	7	2	5	–	7	3	+ 4	133	–	10	5	15	40	– 25	62
March	8	2	3	2	7	3	+ 4	133	–	7	4	11	40	– 29	72
	9	2	3	1	6	3	+ 3	100	–	6	9	15	40	– 25	62
	10	2	1	–	3	3	0	0	–	7	6	13	40	– 27	68
	11	–	1	–	1	3	– 2	67	–	5	7	12	40	– 28	70
	12	–	2	1	3	3	0	0	–	6	10	17	40	– 23	58
	13	–	3	–	3	3	0	0	–	14	7	21	40	– 19	48
April	14	1	3	–	4	3	+ 1	33	–	5	9	14	40	– 26	65
	15	–	3	–	3	3	0	0	–	6	7	13	15	– 2	13
	16	4	–	1	5	3	+ 2	67	–	8	11	19	15	+ 4	27
	17	4	4	1	9	3	+ 6	200	–	2	4	6	15	– 9	60
May	18	–	–	2	2	3	– 1	33	–	2	11	13	15	– 2	13
	19	3	2	–	5	3	+ 2	67	–	7	9	16	15	+ 1	7

TABLE VIII. (*continued*).

Week.		DISEASES OF HEART, ETC.				ALL CAUSES.						
						Ages.						
		All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.		0–15	15–60	60–	All Ages.	Corrected Weekly Average of 5 years.	Departure from Average.	
				Numerical.	Per cent.						Numerical.	Per cent.
Oct.	1847. 40	27	31	− 4	13	504	431	205	1143	1046	+ 97	9
	41	39	31	+ 8	26	497	329	196	1022	1046	− 24	2
	42	19	31	−12	39	421	324	207	953	1046	− 93	9
	43	33	31	+ 2	6	473	322	170	967	1046	− 79	8
	44	21	31	−10	32	465	311	169	945	1046	− 101	10
Nov.	45	36	31	+ 5	16	542	317	193	1052	1046	+ 6	1
	46	39	31	+ 8	26	546	338	214	1098	1046	+ 52	5
	47	28	31	− 3	10	568	333	184	1086	1046	+ 40	4
	48	47	31	+16	52	771	518	388	1677	1046	+ 631	60
Dec.	49	73	31	+42	135	1012	712	730	2454	1046	+1408	135
	50	48	31	+17	55	1016	698	702	2416	1046	+1370	121
	51	45	31	+13	42	818	560	567	1946	1046	+ 900	86
	52	22	31	− 9	28	574	391	281	1247	1046	+ 201	19
	53	45	31	+14	45	750	541	307	1599	1046	+ 553	53
Jan.	1848. 1	22	36	−14	35	663	421	280	1364	1107	+ 257	23
	2	45	36	+ 9	25	689	455	311	1457	1107	+ 350	32
	3	30	36	− 6	17	608	483	310	1401	1107	+ 294	27
	4	40	36	+ 4	11	639	517	300	1457	1107	+ 39	32
Feb.	5	43	36	+ 7	19	630	481	366	1478	1107	+ 371	34
	6	29	36	− 7	19	592	422	310	1324	1107	+ 217	20
	7	24	36	−12	33	509	379	216	1134	1107	+ 27	2
	8	31	36	− 5	14	542	391	212	1145	1107	+ 38	3
March	9	29	36	− 7	19	498	372	222	1114	1107	+ 7	1
	10	26	36	−10	28	520	341	209	1070	1107	− 37	3
	11	25	36	−11	31	505	396	216	1118	1107	+ 11	1
	12	36	36	0	0	504	372	221	1099	1107	− 8	1
	13	45	36	+ 9	25	582	458	253	1294	1107	+ 187	17
April	14	23	36	−13	36	501	312	172	1008	1107	− 99	9
	15	29	30	− 1	3	517	339	189	1047	943	+ 104	11
	16	20	30	−10	33	480	322	189	991	943	+ 48	6
	17	34	30	+ 4	13	470	339	157	966	943	+ 23	2
May	18	17	30	−13	43	458	363	193	1015	943	+ 72	8
	19	27	30	− 3	10	505	349	195	1052	943	+ 109	12

TABLE IX. London, 1890.

Mortality at Different Ages from Influenza and other Causes.

Week.		INFLUENZA. Ages. 0–1	1–5	5–20	20–40	40–60	60–80	80–	All Ages.	Corrected Average of 10 years.	PNEUMONIA. Ages. 0–1	1–5	5–20	20–40	40–60	60–80	80–	All Ages.	Corrected Average of 10 years.	Departure from Average. Numerical.	Per cent.
Jan.	1890. 1	–	–	–	–	3	1	–	4	0·4	27	44	12	59	46	26	1	215	119	+ 96	81
	2	2	1	1	24	28	9	2	67	0·2	35	50	16	63	70	16	3	253	123	+130	105
	3	7	4	9	34	46	26	1	127	0·0	34	44	12	66	89	32	4	281	117	+164	146
	4	4	4	3	30	40	22	2	105	0·3	30	44	8	44	45	20	2	193	118	+ 75	64
Feb.	5	3	4	4	18	30	15	1	75	0·3	22	36	9	26	30	18	4	145	128	+ 17	13
	6	1	3	3	7	11	10	3	38	0·3	28	29	9	14	21	16	–	117	124	– 7	6
	7	4	3	–	3	12	7	1	30	0·2	14	32	4	5	19	16	1	91	122	– 31	25
	8	3	–	2	5	5	7	2	24	0·2	20	32	3	22	29	14	1	121	114	+ 7	6
March	9	1	1	–	6	4	10	1	23	0·3	21	27	6	18	17	20	2	111	103	+ 8	7
	10	2	2	1	4	7	8	–	24	0·1	17	40	4	20	21	17	–	119	120	– 1	1
	11	1	2	2	1	2	3	–	11	0·1	31	25	7	10	23	18	4	118	117	+ 1	1
	12	1	–	1	2	6	6	1	17	0·1	18	29	5	22	16	15	2	107	126	– 19	15
April	13	–	–	–	4	8	1	–	13	0·0	24	35	4	13	17	10	3	106	119	– 13	11
	14	–	–	1	4	2	3	–	10	0·1	15	32	12	14	8	18	–	99	119	– 20	17
	15	–	–	–	2	3	1	1	7	0·0	23	46	5	15	24	14	1	128	117	+ 11	9
	16	–	1	2	1	1	3	1	9	0·1	26	43	7	9	21	18	5	129	111	+ 18	16
May	17	–	–	–	–	5	1	–	6	0·4	22	32	2	20	24	8	3	111	108	+ 3	3
	18	–	–	–	1	–	1	–	2	0·1	22	43	2	22	23	17	2	131	103	+ 28	28
	19	–	–	–	1	1	1	–	3	0·0	24	25	6	12	26	18	1	112	97	+ 15	15
	20	–	–	–	–	–	2	–	2	0·0	28	36	5	12	23	18	1	123	92	+ 31	33
J.	21	–	–	–	–	–	1	–	1	0·0	21	25	7	18	21	13	2	107	87	+ 20	23
	22	–	–	–	1	–	–	–	1	0·0	24	22	4	8	23	24	–	105	82	+ 23	28
Total . . .		29	25	29	148	214	138	16	599	3·2	526	771	149	512	636	386	42	3022	2467		
Average . .		1·3	1·1	1·3	6·7	9·7	6·3	0·7	27·2	0·15	23·9	35·0	6·8	23·3	28·9	17·5	1·9	137·4	112·1		
Per cent. of 'All Ages.'		5	4	5	25	36	23	3	100		17	25	5	17	21	13	1	100			

TABLE IX. (*continued*).

Week.		BRONCHITIS											PHTHISIS.										
		Ages.							All Ages.	Corrected Average of 10 years.	Departure from Average.		Ages.							All Ages.	Corrected Average of 10 years.	Departure from Average.	
		0–1	1–5	5–20	20–40	40–60	60–80	80–			Numerical.	Per cent.	0–1	1–5	5–20	20–40	40–60	60–80	80–			Numerical.	Per cent.
Jan.	1890. 1	76	56	7	35	143	182	31	530	351	+179	51	2	1	20	136	76	11	1	247	178	+ 69	39
	2	91	100	8	46	177	253	40	715	352	+362	103	–	3	22	114	112	16	–	267	184	+ 83	45
	3	71	76	7	43	172	219	42	630	356	+274	77	1	7	34	150	100	19	1	312	181	+131	72
	4	62	69	4	25	116	168	24	468	373	+ 95	26	2	3	12	119	88	15	–	239	187	+ 52	28
Feb.	5	55	48	5	17	77	116	21	339	427	– 88	21	1	5	15	122	59	17	1	220	191	+ 29	15
	6	51	40	7	15	59	114	23	309	391	– 82	21	1	4	14	101	82	7	–	209	193	+ 19	10
	7	59	47	2	9	42	104	20	283	337	– 54	16	–	–	17	108	83	7	–	215	179	+ 36	20
	8	59	51	3	6	43	95	20	277	305	– 28	9	1	3	16	114	68	16	–	218	182	+ 36	20
March	9	65	48	5	9	58	121	22	328	319	+ 9	3	3	2	19	104	77	19	–	224	178	+ 46	26
	10	69	47	3	11	54	119	24	327	319	+ 8	3	3	5	21	94	71	12	–	206	185	+ 21	11
	11	52	46	4	9	41	106	24	382	335	– 53	16	3	–	17	78	53	13	–	164	180	– 16	9
	12	61	39	3	9	36	67	14	229	313	– 84	26	1	8	10	74	59	17	–	169	186	– 17	9
	13	60	53	1	7	29	72	9	231	299	– 68	23	–	3	15	78	47	11	–	154	186	– 32	17
April	14	41	34	1	2	15	55	10	158	261	–103	39	2	6	12	79	68	13	–	180	185	– 5	2
	15	65	52	5	3	27	56	11	219	252	– 33	13	1	7	17	94	38	17	–	174	180	– 6	3
	16	63	47	2	3	34	50	15	214	216	– 2	1	1	6	17	76	71	18	–	189	173	+ 16	9
	17	51	42	2	7	16	55	17	190	202	– 12	6	4	3	15	70	51	11	–	154	181	– 27	15
May	18	48	32	2	5	15	45	8	155	179	– 24	14	–	3	15	71	43	10	1	143	174	– 31	18
	19	51	20	1	4	15	43	17	151	175	– 24	14	–	2	19	64	45	9	–	139	163	– 24	15
	20	34	36	–	4	19	47	10	150	159	– 9	6	1	–	16	76	50	10	1	154	187	– 33	18
J.	21	46	34	1	3	18	49	13	164	145	+ 19	13	2	3	6	56	41	9	–	117	162	– 45	28
	22	46	32	1	3	13	31	3	129	128	+ 2	1	2	2	11	53	40	8	–	116	167	– 51	31
Total . . .		1276	1049	74	275	1219	2167	418	6478	6193			31	76	360	2031	1422	285	5	4210	3962		
Average . .		58·0	47·7	3·4	12·5	55·4	98·5	19·0	294·5	281·5			1·4	3·5	16·4	92·3	64·6	12·9	0·2	191·4	180·1		
Per cent. of 'All Ages.'		20	16	1	4	19	33	6	100				1	2	9	48	34	7	–	100			

TABLE IX. (*continued*).

Week.		PLEURISY.											OTHER DISEASES OF RESPIRATORY SYSTEM.										
		Ages.							All Ages.	Corrected Average of 10 years.	Departure from Average.		Ages.							All Ages.	Corrected Average of 10 years.	Departure from Average.	
		0–1	1–5	5–20	20–40	40–60	60–80	80–			Numerical.	Per cent.	0–1	1–5	5–20	20–40	40–60	60–80	80–			Numerical.	Per cent.
Jan.	1890. 1	–	–	2	3	4	3	1	13	6	+7	117	4	7	10	5	22	22	2	72	48	+24	50
	2	–	–	1	2	5	2	–	10	6	+4	67	6	7	1	8	20	27	5	74	48	+26	54
	3	–	1	1	1	2	1	–	6	7	−1	14	10	8	3	12	21	26	–	80	48	+32	67
	4	1	–	1	2	–	1	–	5	7	−2	28	4	6	1	13	17	21	1	63	55	+ 8	15
Feb.	5	2	–	–	–	2	–	–	4	6	−2	33	12	5	1	8	9	13	2	50	55	− 5	9
	6	2	1	–	1	–	–	–	4	5	−1	20	6	13	1	3	8	6	5	42	49	− 7	14
	7	1	–	2	2	1	2	–	8	6	+2	33	8	10	1	2	9	12	2	44	44	–	–
	8	–	1	–	1	–	4	–	6	6	–	–	8	5	1	4	11	8	–	37	43	− 6	14
March	9	1	–	–	2	3	3	–	9	7	+2	29	5	7	2	1	7	8	2	32	40	− 8	20
	10	–	1	–	2	2	1	–	6	5	+1	20	3	8	2	5	17	11	1	47	45	+ 2	4
	11	–	–	–	1	2	2	–	5	5	–	–	4	3	–	2	6	11	–	26	43	−17	40
	12	–	–	1	2	–	1	–	4	6	−2	33	5	5	1	3	7	8	–	29	44	−15	34
	13	–	–	–	1	–	–	–	1	8	−7	88	2	7	–	2	8	8	–	27	40	−13	32
April	14	–	–	1	1	–	2	–	4	7	−3	43	4	6	3	1	3	8	1	26	40	−14	35
	15	–	–	–	3	–	2	–	5	7	−2	29	6	5	1	3	6	5	–	26	33	− 7	21
	16	–	–	2	–	1	1	–	4	7	−3	43	7	2	2	3	9	4	–	27	32	− 5	16
	17	–	2	2	1	3	2	–	10	6	+4	67	6	4	1	2	3	6	2	24	32	− 8	25
May	18	–	1	1	3	1	2	–	8	6	+2	33	4	6	2	–	2	9	1	24	35	−11	31
	19	–	–	1	3	2	2	–	8	6	+2	33	2	5	–	4	5	4	1	21	27	− 8	30
	20	–	–	–	2	4	–	–	6	6	–	–	4	4	–	–	2	1	1	12	28	−16	57
	21	–	1	–	1	2	2	–	5	4	+1	25	3	1	1	2	5	4	–	16	25	− 9	36
J.	22	–	1	–	2	3	1	–	7	5	+2	40	3	4	1	1	2	2	–	13	27	−14	52
Total . . .		7	9	15	35	37	34	1	138	134			116	128	35	84	199	224	26	812	881		
Average . .		0·3	0·4	0·7	2	2	2	0·04	6·3	6·1			5·3	5·8	1·6	3·8	9·0	10·2	1·2	36·9	40·0		
Per cent. of 'All Ages.'		5	7	11	25	27	25	1	100				14	16	4	10	25	28	3	100			

Note.—The 'Other Diseases of the Respiratory System' do not include Croup.

TABLE IX. (*continued*).

Week.		DISEASES OF CIRCULATORY SYSTEM.											WHOOPING-COUGH.				OLD AGE.			
		Ages.							All Ages.	Corrected Average of 10 years.	Departure from Average.		All Ages.	Corrected Average of 10 years.	Departure from Average.		All Ages.	Corrected Average of 10 years.	Departure from Average.	
		0–1	1–5	5–20	20–40	40–60	60–80	80–			Numerical.	Per cent.			Numerical.	Per cent.			Numerical.	Per cent.
Jan.	1890. 1	2	–	12	28	77	91	12	222	146	+ 76	52	98	74	+ 24	32	67	69	– 2	3
	2	2	1	13	35	98	116	10	275	140	+ 135	96	112	77	+ 35	45	70	65	+ 5	8
	3	2	–	9	36	78	73	11	209	146	+ 63	43	104	80	+ 24	30	83	65	+ 18	28
Feb.	4	–	–	9	22	66	84	11	193	147	+ 46	31	82	101	– 19	19	71	68	+ 3	4
	5	2	–	7	18	33	48	8	116	146	– 30	21	67	111	– 44	40	69	75	– 3	8
	6	2	1	12	23	35	69	12	154	145	+ 9	6	91	109	– 18	17	55	65	– 10	15
	7	2	3	9	14	51	55	9	143	127	+ 16	13	115	97	+ 18	19	61	62	– 1	2
March	8	2	–	11	23	55	63	8	162	134	+ 28	21	103	90	+ 13	14	71	65	+ 6	9
	9	2	1	11	17	44	58	13	146	128	+ 18	14	97	87	+ 10	11	59	59	0	0
	10	2	3	10	16	45	77	10	160	139	+ 24	17	95	86	+ 9	10	47	67	– 20	30
	11	1	2	11	16	40	66	9	145	142	+ 3	2	86	85	+ 1	1	57	67	– 10	15
	12	4	2	9	18	42	64	9	148	134	+ 14	10	76	88	– 12	14	56	65	– 9	14
April	13	–	2	5	19	32	55	7	120	131	– 11	8	101	90	+ 11	12	38	63	– 25	40
	14	2	2	8	10	33	51	8	114	127	– 13	10	84	82	+ 2	2	47	58	– 11	19
	15	2	3	11	30	49	49	7	151	117	+ 34	29	79	88	– 9	10	44	60	– 16	27
	16	–	1	8	16	37	59	12	133	122	+ 11	9	106	85	+ 21	24	52	57	– 5	9
May	17	1	1	5	13	30	63	6	119	110	+ 9	8	88	80	+ 8	10	40	54	– 14	26
	18	4	1	6	21	51	47	10	140	122	+ 18	15	86	76	+ 10	13	43	49	– 6	12
	19	–	1	11	18	38	54	10	132	112	+ 20	18	99	74	+ 25	34	39	47	– 8	17
J.	20	1	–	6	19	45	46	7	124	105	+ 19	18	88	67	+ 21	33	42	49	– 7	14
	21	3	2	5	21	39	40	11	121	104	+ 17	16	91	68	+ 23	34	46	51	– 5	10
	22	2	1	7	21	42	40	4	117	104	+ 13	12	78	58	+ 20	34	42	44	– 2	5
Total . . .		39	27	195	454	1060	1368	204	3347	2828			2026	1853			1199	1324		
Average . .		2	1	9	21	48	62	9	152·1	128·5			92·1	84·2			59·0	60·2		
Per cent. of 'All Ages.'		1	1	6	14	32	41	6	100											

TABLE IX. (*continued*).

Week.			PREMATURE BIRTH.				ACCIDENTS OF CHILD-BIRTH.				ALL CAUSES.										
											Ages.										
			All Ages.	Corrected Average of 10 years.	Departure from Average.		All Ages.	Corrected Average of 10 years.	Departure from Average.		0–1	1–5	5–20	20–40	40–60	60–80	80–	All Ages.	Corrected Average of 10 years.	Departure from Average.	
					Numerical.	Per cent.			Numerical.	Per cent.										Numerical.	Per cent.
Jan.	1890.	1	50	40	+ 10	25	3	4	− 1	25	398	310	126	346	541	552	98	2371	1948	+ 423	22
		2	65	37	+ 28	76	4	4	0	0	430	375	134	367	670	640	131	2747	1937	+ 810	42
		3	42	43	− 1	2	2	2	0	0	415	344	150	450	666	576	119	2720	1955	+ 765	39
		4	52	41	+ 11	27	4	5	− 1	20	386	294	95	349	510	503	90	2227	1967	+ 260	13
Feb.		5	43	40	+ 3	8	4	5	− 1	20	350	250	103	282	369	390	105	1849	2060	− 211	10
		6	40	40	0	0	3	5	− 2	40	372	254	88	238	338	363	100	1749	1975	− 226	11
		7	37	37	0	0	5	5	0	0	352	306	105	218	357	390	81	1809	1867	− 58	3
		8	43	40	+ 3	8	2	4	− 2	50	393	259	101	256	363	374	101	1847	1834	+ 13	1
March		9	41	40	+ 1	2	4	5	− 1	20	368	263	108	234	325	418	87	1803	1815	− 12	1
		10	46	39	+ 7	18	7	5	+ 2	40	394	294	110	226	348	428	89	1889	1881	+ 8	0
		11	44	37	+ 7	19	1	4	− 3	75	392	271	113	196	303	404	92	1771	1866	− 95	5
		12	42	39	+ 3	8	−	4	− 4	100	381	270	78	193	296	342	77	1637	1868	− 231	12
April		13	36	39	− 3	8	3	5	− 2	40	366	304	73	204	264	309	51	1571	1836	− 265	14
		14	22	36	− 14	39	2	4	− 2	50	310	253	94	183	239	285	55	1419	1718	− 362	20
		15	32	38	− 6	16	2	5	− 3	60	372	298	104	204	275	308	58	1619	1764	− 145	8
		16	40	38	+ 2	5	2	4	− 2	50	356	323	104	177	282	291	79	1612	1712	− 100	6
May		17	48	36	+ 12	33	5	4	+ 1	25	369	286	87	197	255	313	60	1567	1652	− 85	5
		18	36	36	0	0	6	5	+ 1	20	337	294	90	210	227	305	70	1533	1623	− 90	6
		19	45	39	+ 6	15	3	4	− 1	25	360	251	101	170	243	274	70	1469	1576	− 106	7
		20	47	41	+ 6	15	3	4	− 1	25	339	266	102	178	261	257	63	1466	1574	− 108	7
J.		21	43	38	+ 5	13	4	4	0	0	335	307	97	166	235	239	72	1451	1537	− 86	6
		22	52	35	+ 17	49	8	4	+ 4	100	349	250	114	186	222	244	46	1411	1491	− 80	5
Total . . .			946	849			77	95			8124	6322	2277	5220	7585	8205	1794	39537	39519		
Average . .			43·0	38·6			3·5	4·3			369·3	287·4	103·5	237·3	344·8	373·0	81·5	1797·1	1796·3		
Per cent. of 'All Ages.'											21	16	6	13	19	21	5	100			

TABLE X. London, 1888, 1889, 1890.

Percentage Mortality at Different Ages.

	Ages.							All Ages.
	1-0	1-5	5-20	20-40	40-60	60-80	80-	
INFLUENZA.								
1890.								
1st 22 weeks.								
Influenza present.								
No. of Deaths .	29	25	29	148	214	138	16	599
Per cent. . .	5	4	5	25	36	23	3	100
6 weeks, 2nd–7th.								
Influenza at height.								
No. of Deaths .	21	19	20	116	167	89	10	442
Per cent. . .	5	4	4	26	38	20	2	100
Remaining 16 wks.								
No. of Deaths .	8	6	9	32	47	49	6	157
Per cent. . .	5	4	6	20	30	31	4	100
PNEUMONIA.								
1890.								
1st 22 weeks.								
Influenza present.								
No. of Deaths . .	526	771	149	512	636	386	42	3022
Per cent. . . .	17	25	5	17	21	13	1	100
6 weeks, 2nd–7th.								
Influenza at height.								
No. of Deaths . .	163	235	58	218	274	118	14	1080
Per cent. . . .	15	22	5	20	25	11	1	100
Remaining 16 wks.								
No. of Deaths . .	363	536	91	294	362	268	28	1942
Per cent. . . .	19	28	5	15	19	14	1	100
1888.								
1st 22 weeks.								
No Influenza.								
No of Deaths . .	446	640	150	379	493	375	45	2528
Per cent. . . .	18	25	6	15	20	15	2	100
1889.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	457	612	105	211	310	288	33	2016
Per cent. . . .	23	30	5	11	15	14	1	100
BRONCHITIS.								
1890.								
1st 22 weeks.								
Influenza present.								
No. of Deaths . .	1276	1049	74	275	1219	2167	418	6478
Per cent. . . .	20	16	1	4	19	33	6	100
6 weeks, 2nd–7th.								
Influenza at height.								
No. of Deaths . .	389	380	33	155	643	974	170	2744
Per cent. . . .	14	14	1	6	24	36	6	100
Remaining 16 wks.								
No. of Deaths . .	887	669	41	120	576	1193	248	3734
Per cent. . . .	24	18	1	3	15	32	7	100
1888.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	1160	979	64	139	935	2009	401	5711
Per cent. . . .	20	17	1	3	16	35	7	100
1889.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	989	788	51	120	682	1683	355	4708
Per cent. . . .	21	17	1	3	15	36	8	100

TABLE X. (*continued*).

	Ages.							All Ages.
	0–1	1–5	5–20	20–40	40–60	60–80	80–	
PHTHISIS.								
1890.								
1st 22 weeks.								
Influenza present.								
No. of Deaths . .	31	76	360	2031	1422	285	5	4210
Per cent. . . .	1	2	9	48	34	7	–	100
6 weeks, 2nd–7th.								
Influenza at height.								
No. of Deaths . .	5	22	114	714	524	81	2	1462
Per cent. . . .	–	2	8	49	36	6	–	100
1888.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	35	99	287	1617	1102	217	7	3364
Per cent. . . .	1	3	9	48	33	7	–	100
1889.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	46	78	268	1534	1107	230	1	3264
Per cent. . . .	1	2	8	47	34	7	–	100
ALL CAUSES.								
1890.								
1st 22 weeks.								
Influenza present.								
No. of Deaths . .	8124	6322	2277	5220	7585	8205	1794	39537
Per cent. . . .	21	16	6	13	19	21	5	100
6 weeks, 2nd–7th.								
Influenza at height.								
No. of Deaths . .	2305	1823	675	1904	2910	2862	626	13105
Per cent. . . .	18	13	5	15	22	22	5	100
1888.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	7899	6135	2269	4449	6479	7672	1719	36630
Per cent. . . .	22	17	6	12	18	21	4	100
1889.								
1st 22 weeks.								
No Influenza.								
No. of Deaths . .	7231	5728	1958	3916	5914	7094	1585	33426
Per cent. . . .	22	17	6	12	18	22	4	100

TABLE XI. Paris, 1889, 1890.

Mortality at Different Ages.

	Ages.						All Ages.
	0–1	1–5	5–20	20–40	40–60	60–	
ALL CAUSES.							
1890.							
1st week.							
Influenza present.							
No. of Deaths .	203	171	91	570	743	905	2683
Per cent. . .	7	6	3	21	28	34	100
1889.							
1st week.							
Influenza absent.							
No. of Deaths .	149	117	51	179	214	260	970
Per cent. . .	15	12	5	18	22	27	100
ALL CAUSES.		0–5					
1890.							
2nd week.							
Influenza present.							
No. of Deaths .		299	84	410	543	729	2065
Per cent. . .		14	4	20	26	36	100
1889.							
2nd week.							
Influenza absent.							
No. of Deaths .		286	54	182	221	297	1040
Per cent. . .		28	5	18	21	29	100
PNEUMONIA, BRONCHO-PNEUMONIA AND ACUTE BRONCHITIS.							
1890.							
1st week.							
Influenza present.							
No. of Deaths .		111	22	127	249	290	799
Per cent. . .		13	3	16	31	36	100
1889.							
1st week.							
Influenza absent.							
No. of Deaths .		45	6	7	14	35	109
Per cent. . .		42	6	7	13	33	100

TABLE XII. London, 1847, 1848, 1888, 1889, 1890.

Percentage Mortality at Different Ages.

	Ages.			All Ages.
	0–20	20–60	60–	
INFLUENZA.				
1847, 1848, 14 weeks.				
No. of Deaths . .	439	481	742	1662
Per cent. of Total .	26	29	45	100
1890.				
No. of Deaths . .	60	283	99	442
Per cent. of Total .	13	64	22	100
PNEUMONIA.				
1847, 1848, 14 weeks.				
No. of Deaths . .	782	323	159	2267
Per cent. of Total .	79	14	7	100
1890, 6 weeks.				
No. of Deaths . .	456	492	132	1080
Per cent. of Total .	42	45	12	100
1889, 6 weeks.				
No. of Deaths . .	339	159	95	593
Per cent. of Total .	57	27	16	100
1888, 6 weeks.				
No. of Deaths . .	391	287	121	799
Per cent. of Total .	49	36	15	100
BRONCHITIS.				
1847, 1848.				
No. of Deaths . .	777	632	864	2273
Per cent. of Total .	34	28	38	100
1890.				
No. of Deaths . .	802	798	1144	2744
Per cent. of Total .	29	29	42	100
1889.				
No. of Deaths . .	593	336	868	1797
Per cent. of Total .	33	19	48	100
1888.				
No. of Deaths . .	692	406	893	1991
Per cent. of Total .	35	20	45	100
PHTHISIS.				
1847, 1848.				
No. of Deaths . .	271	1749	118	2139
Per cent. of Total .	13	82	5	100
1890.				
No. of Deaths . .	141	1238	83	1462
Per cent. of Total .	10	85	6	100
1889.				
No. of Deaths . .	100	740	71	911
Per cent. of Total .	11	81	8	100
1888.				
No. of Deaths . .	97	766	69	932
Per cent. of Total .	10	82	7	100

TABLE XII. (*continued*).

	Ages.			All Ages.
	0–20	20–60	60–	
ASTHMA.				
1847, 1848.				
No. of Deaths . .	5	241	326	572
Per cent. of Total .	1	42	57	100
PLEURISY.				
1847, 1848.				
No. of Deaths . .	19	57	17	93
Per cent. of Total .	20	61	18	100
1890.				
No. of Deaths . .	13	18	6	37
Per cent. of Total .	35	49	16	100
1889.				
No. of Deaths . .	8	19	9	36
Per cent. of Total .	22	53	25	100
1888.				
No. of Deaths . .	12	21	8	41
Per cent. of Total .	29	51	20	100
DISEASES OF CIRCULATORY SYSTEM.				
1890.				
No. of Deaths . .	75	509	506	1090
Per cent. of Total .	7	47	46	100
1889.				
No. of Deaths . .	66	398	421	885
Per cent. of Total .	7	45	48	100
1888.				
No. of Deaths . .	100	386	440	926
Per cent. of Total .	11	42	47	100
ALL CAUSES.				
1847, 1848.				
No. of Deaths . .	9813	6969	5280	22099
Per cent. of Total .	44	32	24	100
1890.				
No. of Deaths . .	4803	4814	3488	13105
Per cent. of Total .	37	37	26	100
1889.				
No. of Deaths . .	4355	2841	2816	10012
Per cent. of Total .	43	28	28	100
1888.				
No. of Deaths . .	5005	3222	2942	11177
Per cent. of Total .	45	29	26	100

Note.—For the years 1847, 1848 the first two groups of ages are 0–15 and 15–60, instead of 0–20 and 20–60 as in the other years.

The periods taken are (1) for the epidemic of 1847, the last 6 weeks of 1847 and the first 8 weeks of 1848; (2) for the epidemic of 1890, the 6 weeks from the 2nd to the 7th; (3) for the non-epidemic years 1888 and 1889, the 6 weeks corresponding to the last, viz. the 2nd to the 7th.

TABLE XIII. LONDON, 1891.

Temperature, Rainfall, &c., and Mortality from Influenza.

Week.		Influenza. No. of Deaths.	Average Mean Daily Value in Degrees Fahrenheit.	Departure from Average of 20 years.	Rainfall in Inches.	Wind.		Humidity. (Saturation = 100.)
						General Direction.	Horizontal Movement of Air. Departure from Average of 16 years.	
			°	°			Miles.	
Jan.	1891. 1	3	27·5	−10·1	0·13	V.	− 670	83
	2	3	30·9	− 7·4	0·14	N.	− 386	88
	3	1	35·3	− 4·0	0·56	SW.	+ 442	83
	4	2	44·2	+ 4·1	0·68	S., SW. & SSW.	+ 519	88
Feb.	5	3	41·1	+ 0·6	0·04	V.	− 939	91
	6	2	38·4	− 0·7	0·00	V.	− 777	84
	7	−	36·6	− 2·5	0·00	SW. & E.	−1208	93
	8	2	37·9	− 2·0	0·00	C. & E.	−1557	86
March	9	2	46·6	+ 6·2	0·21	WSW.	+1057	77
	10	2	35·3	− 5·5	1·16	NE.	+ 171	83
	11	1	38·9	− 2·4	0·46	V.	− 108	83
	12	3	40·2	− 2·2	0·31	SW.	+ 673	71
	13	7	41·5	− 3·7	0 36	V.	− 133	71
April	14	3	42·6	− 4·3	0·19	NNE.	− 97	86
	15	9	43·9	− 3·6	0·16	V.	− 614	72
	16	10	44·4	− 3·9	0·01	NE. & ENE.	+ 64	72
	17	37	49·1	+ 0·5	0·19	V.	+ 735	77
May	18	148	51·3	+ 1·3	0·02	V.	− 251	72
	19	266	54·5	+ 2·3	0·34	N.	+ 50	75
	20	319	45·5	− 9·2	1·17	NNE. & SW.	− 282	83
	21	310	48·7	− 7·6	0·98	SW.	− 83	84
June	22	303	58·9	+ 1·1	0·25	V.	− 197	80
	23	249	54·5	− 4·2	0·00	NNE.	+ 270	73
	24	182	62·2	+ 2·4	0·05	V.	− 280	70
	25	117	64·0	+ 2·5	0·62	NE. & SW.	− 13	78
July	26	56	62·4	+ 0·8	0·72	SW. & SSW.	+ 121	77
	27	40	59·2	− 3·0	1·14	SW. & NW.	+ 521	81
	28	29	63·4	0·0	0·02	ENE. & SSW.	− 315	71
	29	18	60·9	− 2·1	0·41	SW.	+ 338	77
Aug.	30	17	57·0	− 5·6	1·17	W.	− 23	82
	31	6	57·4	− 5·3	1·04	SW. & WSW.	− 116	84
	32	10	61·4	− 1·1	0·30	SW. & WSW.	+ 620	81
	33	9	58·0	− 3·7	1.46	SW.	− 12	84
Sep.	34	7	58·4	− 2·5	0.69	SW.	+1025	83
	35	12	57·4	− 2·5	0·29	SW.	+ 352	81
	36	4	62·9	+ 4·4	0·06	SW. & SE.	− 719	72

TABLE XIV. London, 1891.

Mortality from Different Causes.

Week		BRONCHITIS.		PNEUMONIA.		PHTHISIS.		PLEURISY.	
		No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.
Jan.	1891. 1	642	+ 71	243	+ 87	183	− 3	18	+125
	2	711	+ 81	228	+ 65	216	+10	7	0
	3	541	+ 41	212	+ 58	182	− 8	9	+ 29
	4	377	+ 3	180	+ 46	136	−28	14	+100
Feb.	5	242	− 27	120	− 1	170	− 6	5	− 17
	6	281	− 18	149	+ 26	188	− 1	8	+ 33
	7	308	− 2	150	+ 29	175	− 5	9	+ 50
	8	411	+ 36	193	+ 66	187	− 1	9	+ 50
March	9	409	+ 25	201	+ 90	168	−10	13	+ 86
	10	315	− 6	208	+ 68	173	−10	12	+100
	11	327	− 4	164	+ 33	159	−14	12	+100
	12	257	− 18	153	+ 19	170	− 9	6	0
	13	261	− 12	116	+ 47	171	− 6	8	+ 14
April	14	255	+ 1	150	+ 26	155	−18	10	+ 33
	15	257	+ 1	185	+ 50	145	−21	11	+ 83
	16	240	+ 9	179	+ 56	177	− 1	9	+ 12
	17	280	+ 36	241	+115	173	− 4	17	+143
May	18	302	+ 69	230	+113	183	+ 4	15	+114
	19	352	+103	207	+107	198	+21	6	− 14
	20	337	+109	219	+121	188	0	5	− 29
	21	353	+142	189	+112	195	+27	6	+ 20
June	22	320	+154	176	+110	188	+18	3	− 50
	23	255	+109	166	+116	175	+ 9	11	+120
	24	248	+128	159	+112	183	+15	3	− 25
	25	151	+ 45	113	+ 61	169	+11	7	+ 40
July	26	108	+ 6	103	+ 49	163	+ 5	8	+ 33
	27	102	+ 3	61	− 10	143	− 2	3	− 40
	28	94	− 3	62	− 6	134	−11	5	+ 25
	29	82	− 18	68	+ 19	145	− 4	4	− 20
Aug.	30	92	+ 8	59	− 2	146	− 5	6	+ 50
	31	114	+ 18	53	− 9	126	−17	8	+100
	32	100	+ 11	66	+ 6	164	+11	2	− 60
	33	75	− 17	59	+ 2	130	−16	5	0
Sep.	34	76	− 16	40	− 27	137	− 9	9	+125
	35					138	−12		
	36					124	−16		

TABLE XIV. (*continued*).

Week.		OTHER DISEASES OF RESPIRATORY SYSTEM.		DISEASES OF CIRCULATORY SYSTEM.		WHOOPING-COUGH.		ENTERITIS.	
		No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.
Jan.	1891. 1	78	+31	220	+36	76	+ 6	6	0
	2	62	+22	220	+36	46	−40	9	0
	3	74	+45	194	+22	58	−24	5	− 38
	4	59	+ 7	156	0	58	−35	14	+ 75
Feb.	5	52	+ 8	134	− 3	37	−59	11	+ 83
	6	34	−24	155	+ 4	39	−60	8	+ 14
	7	48	+12	153	+14	45	−51	6	− 25
	8	54	+26	184	+28	62	−29	13	+ 86
March	9	40	− 2	172	+27	68	−16	9	+ 80
	10	40	−13	129	−13	55	−35	14	+ 75
	11	41	− 5	142	− 5	48	−41	7	− 12
	12	37	−14	139	− 1	48	−43	9	+ 29
	13	32	−18	173	+31	61	−29	8	+ 14
April	14	39	0	147	+15	61	−26	4	− 43
	15	40	+25	169	+36	46	−46	9	+ 50
	16	34	+ 3	196	+53	54	−39	10	+ 67
	17	42	+31	156	+36	72	−12	11	+ 38
	18	28	−18	169	+31	74	− 5	11	+ 83
May	19	50	+92	155	+30	69	− 9	11	+ 83
	20	30	+20	157	+40	53	−24	5	− 29
	21	35	+52	200	+87	70	+ 4	13	+ 62
	22	40	+54	187	+80	64	+ 8	5	− 29
June	23	20	− 9	153	+51	56	+ 4	12	+140
	24	23	0	147	+52	44	−10	9	+ 12
	25	16	−24	120	+20	55	+ 6	7	− 30
	26	13	−35	113	+13	41	−23	11	+ 22
July	27	16	−20	93	− 9	51	− 2	23	+ 64
	28	24	+20	107	+ 6	48	−11	16	− 11
	29	16	−16	111	+12	33	−38	29	+ 45
	30	10	−47	101	+11	43	−14	47	+147
Aug.	31	13	32	99	+ 6	38	− 7	40	+122
	32	12	−33	111	+16	52	+53	31	+ 72
	33	11	−45	94	− 2	44	+29	37	+118
	34	21	+24	103	+ 5	48	+37	29	+ 71
Sep.	35					40	+38		
	36					44	+26		

Note.—The 'Other Diseases of Respiratory System' do not include Croup.

TABLE XIV. (*continued*).

Week.		APOPLEXY.		EPILEPSY.		CONVULSIONS.		OTHER DISEASES OF BRAIN AND NERVOUS SYSTEM.	
		No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.
Jan.	1891. 1	62	+15	4	− 50	49	−11	125	+23
	2	56	+ 4	11	+ 57	54	0	125	+23
	3	52	0	3	− 67	60	+ 3	110	+10
	4	54	+10	13	+ 86	56	+ 6	112	+14
Feb.	5	51	+ 6	9	+ 29	46	−15	121	+15
	6	41	−11	7	− 22	36	−31	79	−22
	7	43	−12	3	− 67	43	−17	98	− 8
	8	35	−29	7	− 12	51	− 6	114	+10
March	9	54	+ 5	11	+ 57	52	− 9	128	+23
	10	47	−16	7	− 22	45	−22	110	0
	11	44	−10	5	− 29	51	0	115	+ 6
	12	46	− 4	9	+ 50	55	− 2	101	− 4
April	13	62	+27	7	+ 17	48	− 6	103	+ 4
	14	58	+26	8	+ 33	42	−26	108	+ 7
	15	46	− 2	9	+ 12	44	−19	98	− 8
	16	40	−11	10	+ 11	56	+ 2	87	−13
	17	71	+58	9	+ 33	42	−11	82	−16
May	18	53	+18	12	+ 50	41	− 5	102	+ 6
	19	52	+18	11	+ 57	51	+ 2	105	+13
	20	57	+30	5	− 44	58	+21	89	− 5
	21	55	+28	12	+100	53	+10	119	+25
June	22	35	−12	12	+ 50	51	+19	109	+18
	23	37	− 3	6	− 14	49	+26	91	+ 1
	24	46	+18	12	+ 50	39	− 7	94	+10
	25	37	− 5	6	− 25	47	+12	84	+ 2
July	26	30	−25	10	+ 43	36	−22	83	− 3
	27	39	0	8	0	42	−29	77	−14
	28	46	+15	10	+ 25	37	−35	71	−16
	29	42	+17	9	+ 50	34	−44	72	−24
Aug.	30	31	−14	8	+ 14	57	−10	101	+16
	31	35	−10	10	+ 43	45	−20	85	− 1
	32	48	+26	2	− 71	65	+27	97	+11
	33	30	−17	7	0	39	−25	80	− 1
Sep.	34	39	+ 3	9	+ 80	44	−10	67	−11
	35	31	−11	10	+ 43	39	−13	70	− 9
	36	32	−20	8	+ 33	37	−20	60	−19

TABLE XIV. (*continued*).

Week.		PREMATURE BIRTH.		ACCIDENTS OF CHILDBIRTH.		OLD AGE.		ALL CAUSES.	
		No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.	No. of Deaths.	Per cent. Departure from Mean of 10 years.
Jan.	1891. 1	49	+17	8	+100	72	+ 3	2505	+24
	2	48	+14	11	+120	83	+24	2513	+23
	3	50	+14	5	+150	92	+35	2212	+ 8
Feb.	4	34	−19	9	+125	50	−28	1903	− 3
	5	31	−24	5	+ 25	52	−27	1639	−13
	6	44	+ 5	3	− 25	68	+ 6	1673	−12
	7	58	+57	5	− 17	61	− 3	1762	− 4
	8	46	+12	10	+150	62	− 6	2042	+10
March	9	53	+29	8	+ 60	46	−26	2019	+10
	10	41	0	4	− 20	40	−40	1783	− 8
	11	33	−15	10	+233	43	−36	1751	− 8
	12	47	+18	8	+100	55	−19	1667	−11
	13	44	+13	4	0	46	−25	1799	− 1
April	14	50	+39	0	−100	46	−22	1723	− 3
	15	52	+33	8	+ 60	49	−17	1767	0
	16	48	+23	6	+100	57	− 3	1809	+ 4
	17	42	+11	5	+ 25	73	+35	2006	+20
	18	48	+30	4	− 20	56	+10	2069	+26
May	19	41	+ 5	9	+125	66	+40	2245	+41
	20	53	+23	15	+400	55	+10	2235	+40
	21	57	+46	8	+100	66	+29	2337	+56
	22	46	+28	4	0	75	+74	2189	+51
June	23	46	+28	2	− 33	58	+45	1886	+32
	24	39	+ 5	6	+ 50	62	+35	1865	+35
	25	45	+12	5	0	61	+42	1538	+11
July	26	30	−12	6	+ 50	45	− 2	1363	− 4
	27	45	+36	4	0	37	−18	1352	−12
	28	46	+24	4	0	36	−14	1373	−20
	29	46	+10	6	+200	19	−52	1462	−17
Aug.	30	53	+36	3	− 25	24	−38	1662	− 6
	31	53	+39	3	− 25	30	−30	1646	− 2
	32	45	+18	6	+ 50	47	+ 5	1627	+ 1
	33	48	+14	5	+ 25	26	−42	1445	−10
Sep.	34	54	+42	8	+100	44	+ 7	1403	− 7
	35							1299	−10
	36							1217	−13

Note.—For mortality from Influenza, see Table XIII. The epidemic culminated in the third week of May.

TABLE XV. London, 1891. 10 weeks, 17th–26th.

Percentage Mortality at Different Ages.

	Ages.							All Ages.
	0–1	1–5	5–20	20–40	40–60	60–80	80–	
INFLUENZA.								
No. of Deaths. .	91	123	92	301	523	736	124	1990
Per cent. of Total	5	6	5	15	26	37	6	100
PNEUMONIA.								
No. of Deaths. .	278	338	64	237	373	299	34	1623
Per cent. of Total	17	21	4	15	23	18	2	100
BRONCHITIS.								
No. of Deaths. .	496	358	28	78	414	959	195	2528
Per cent. of Total	20	14	1	3	16	38	8	100
ALL CAUSES.								
No. of Deaths. .	3537	2517	1059	2539	3888	4568	971	19079
Per cent. of Total	19	13	6	13	20	24	5	100

TABLE XVI. London, 1891, 1892.

Temperature, Rainfall, &c., and Mortality from Influenza.

	Week.		Influenza. No. of Deaths.	Temperature of Air.		Rainfall in Inches.	Wind.		Humidity (Saturation = 100).
				Average Mean Daily Value in Degrees Fahrenheit.	Departure from Average of 20 years.		General Direction.	Horizontal Movement of Air. Departure from Average of 16 years.	
								Miles.	
Dec.	1891.	49	8	44·9	+ 2·3	0·96	SW.	+ 1907	82
		50	17	40·7	− 0·1	0·51	V.	+ 229	79
		51	19	29·1	− 10·2	0·02	C.	− 1341	93
		52	37	43·0	+ 4·5	0·56	SW.	+ 852	86
Jan.	1892.	1	95	33·1	− 4·6	0·09	W.	+ 219	80
		2	271	30·8	− 7·3	0·01	N	− 938	84
		3	506	37·4	− 1·7	0·13	E. & SW.	− 959	90
		4	436	42·7	+ 2·7	0·11	WSW. & SW.	+ 716	87
Feb.		5	314	41·5	+ 0·9	0·29	SW. & WSW.	+ 579	81
		6	183	43·3	+ 3·9	0·19	NNW. & WSW.	− 339	86

TABLE XVII. LONDON, 1891, 1892.

Mortality from Influenza and other Causes.

Week.		Influenza.	Phthisis.	Mean (10 years).	Bronchitis.	Mean (10 years).	Pneumonia.	Mean (10 years).	Pleurisy.	Mean (10 years).	'Other Diseases of Respiratory System.'	Mean (10 years).	Whooping-Cough.	Mean (10 years).	Premature Birth.	Mean (10 years).	Old Age.	Mean (10 years).	Apoplexy.	Mean (10 years).
Dec.	1891. 49	8	137	170	205	277	100	111	5	5	28	35	56	42	30	40	42	54	32	49
	50	17	134	176	209	312	97	115	2	7	23	46	71	49	48	38	38	61	40	50
	51	19	204	169	355	320	131	120	8	5	49	43	93	58	31	38	43	61	44	46
	52	37	258	182	927	344	256	120	9	7	120	51	180	66	45	39	90	66	79	50
Jan.	1892. 1	95	177	188	740	407	246	143	5	9	79	54	153	74	59	43	80	70	45	54
	2	271	238	195	867	430	285	148	3	7	79	52	166	77	56	43	81	67	68	53
	3	506	228	188	1035	382	317	142	7	7	99	49	170	77	63	46	123	70	69	48
	4	436	211	176	844	343	255	125	7	8	73	49	155	88	55	42	119	62	53	48
Feb.	5	314	186	178	492	301	215	117	9	6	35	45	137	88	36	40	81	64	45	46
	6	183	179	188	368	332	140	121	6	6	40	42	104	97	44	41	42	61	50	47

Week.		Epilepsy.	Mean (10 years).	'Other Diseases of Brain and Nervous System.'	Mean (10 years).	Diseases of Circulatory System.	Mean (10 years).	Enteritis.	Mean (10 years).	Accidents of Childbirth.	Mean (10 years).	Puerperal Fever.	Mean (10 years).	All Causes.	Mean (10 years).	Deaths per 1000 per Annum.
Dec.	1891. 49	8	6	74	85	118	137	8	7	4	3	7	7	1462	1715	18·1
	50	9	5	72	90	125	136	7	6	4	4	1	7	1449	1778	17·9
	51	8	7	61	94	148	143	7	8	2	3	3	8	1771	1813	21·9
	52	12	9	134	95	317	154	10	7	4	5	9	6	3399	1915	42·0
Jan.	1892. 1	4	8	91	106	178	170	14	6	9	4	5	9	2679	2055	32·8
	2	9	7	111	103	247	170	12	8	5	5	10	9	3271	2078	40·0
	3	15	8	120	98	254	162	8	8	6	2	3	7	3761	1999	46·0
	4	10	7	162	98	230	153	18	9	11	4	7	8	3355	1884	41·0
Feb.	5	8	7	114	103	161	134	10	7	4	5	2	6	2500	1802	30·6
	6	13	8	82	96	141	150	9	7	7	4	6	8	2010	1837	24·6

TABLE XVIII. Paris, 1891, 1892.

Temperature, Rainfall, &c., and Mortality from Influenza.

	Week.	Deaths from Influenza.	Temperature of the Air.		Rainfall in Millimetres.	Prevalent Wind.	Movement of Air in Kilometres per hour.
			Mean Daily Value (Weekly Average).	Departure from Mean of 16 years.			
			°C.	°C.			
Oct.	1891. 40	...	14·9	+ 2·4	10·6	SSE.	17·7
	41	...	13·8	+ 2·9	17·3	S., SW.	18·7
	42	...	12·0	+ 2·4	10·4	S., SW.	14·9
Nov.	43	...	8·4	+ 0·2	3·2	NE.	19·5
	44	...	3·9	− 3·8	0·1	NNE.	16·3
	45	...	6·0	− 1·2	22·9	S.	19·5
	46	...	9·8	+ 3·8	9·7	SSW.	12·8
	47	5	2·9	− 2·4	4·4	V.	10·4
Dec.	48	6	7·4	+ 3·1	16·6	SSW.	14·5
	49	4	8·5	+ 5·0	12·8	SW.	25·2
	50	5	5·6	+ 2·6	17·2	SW. NE.	21·9
	51	4	− 1·4	− 3·9	3·3	ENE.—S.	10·0
	52	5	7·3	+ 4·9	22·2	SW.	20·1
Jan.	1892. 1	34	2·6	− 0·1	5·2	SW.	16·4
	2	60	− 1·9	− 4·2	0·0	V.	12·5
	3	51	2·1	− 0·1	1·4	ESE.—SSW.	9·2

TABLE XIX. Paris, 1891, 1892.

Mortality from Influenza and other Diseases.

Week.			Influenza.	Phthisis.	Mean of 4 years.	Organic Disease of Heart.	Mean of 4 years.	Acute Bronchitis.	Mean of 4 years.	Chronic Bronchitis.	Mean of 4 years.	Broncho-pneumonia.	Mean of 4 years.	Pneumonia.	Mean of 4 years.	Meningitis.	Mean of 4 years.
Oct.	1891.	40	...	181	193	58	54	12	21	23	31	16	18	35	43	30	26
		41	...	189	193	51	54	4	21	28	31	16	18	30	43	25	26
		42	...	205	193	53	54	7	21	28	31	16	18	23	43	26	26
		43	...	182	193	57	54	21	21	27	31	29	18	29	43	25	26
Nov.		44	...	209	187	49	57	21	25	26	35	19	25	42	50	31	26
		45	...	210	187	53	57	26	25	46	35	35	25	55	50	16	26
		46	...	187	187	57	57	22	25	46	35	42	25	86	50	29	26
		47	5	191	187	47	57	31	25	34	35	46	25	73	50	22	26
Dec.		48	6	186	193	55	61	33	39	42	44	33	31	69	61	22	30
		49	4	199	187	53	57	33	25	40	35	45	25	53	50	22	26
		50	5	182	187	52	57	33	25	37	35	41	25	52	50	29	26
		51	4	233	187	51	57	36	25	47	35	47	25	73	50	30	26
		52	5	202	187	67	57	48	25	63	35	60	25	83	50	27	26
Jan.	1892.	1	34	222	195	86	63	50	40	81	54	76	39	137	86	30	32
		2	60	213	195	86	63	73	40	108	54	99	39	144	86	37	32
		3	51	255	195	86	63	73	40	85	54	99	39	164	86	33	32

TABLE XIX. (*continued*).

Week.			Cerebral Congestion and Hæmorrhage.	Mean of 4 years.	Paralysis.	Mean of 4 years.	Softening of Brain.	Mean of 4 years.	Diarrhœa in Persons of over 5 Yrs.	Mean of 4 years.	Puerperal Fever and Puerperal Peritonitis.	Mean of 4 years.	Other Puerperal Diseases.	Mean of 4 years.	Old Age.	Mean of 4 years.	All Causes.	Mean of 4 years.
Oct.	1891.	40	52	45	6	6	5	7	5	5	4	3	1	2	25	27	887	903
		41	41	45	5	6	7	7	5	5	1	3	2	2	30	27	820	903
		42	37	45	9	6	6	7	3	5	1	3	–	2	27	27	858	903
		43	46	45	9	6	3	7	4	5	1	3	1	2	18	27	851	903
Nov.		44	39	45	8	6	14	9	2	5	6	3	3	2	25	29	924	918
		45	42	45	9	6	13	9	8	5	3	3	3	2	36	23	1029	918
		46	40	45	5	6	5	9	2	5	3	3	4	2	38	29	1024	918
		47	35	45	7	6	7	9	3	5	1	3	–	2	33	29	929	918
Dec.		48	43	55	12	8	7	10	2	4	6	4	3	2	33	35	971	1036
		49	43	45	6	6	4	9	3	5	2	3	5	2	27	29	940	918
		50	42	45	5	6	7	9	3	5	1	3	1	2	26	29	916	918
		51	54	45	10	6	7	9	4	5	3	3	4	2	38	29	1101	918
		52	47	45	10	6	9	9	3	5	1	3	2	2	47	29	1161	918
Jan.	1892.	1	62	60	8	7	10	9	7	4	5	4	4	1	49	40	1370	1129
		2	73	60	14	7	14	9	3	4	8	4	2	1	74	40	1560	1129
		3	48	60	16	7	17	9	2	4	8	4	1	1	64	40	1615	1129

TABLE XX. Berlin, 1891, 1892.

Temperature, and Mortality from Influenza and other Diseases.

Week.			Temperature of Air.		Influenza.	Heart Disease.	Puerperal Fever.	Meningitis.	Cerebral Inflammation.	Apoplexy.	Laryngitis.	Acute Bronchitis.	Chronic Bronchial Catarrh.	Pneumonia.	Phthisis.	Pleurisy.	Measles.	Scarlet Fever.	Diphtheria.	Croup.	Whooping-Cough.	All Causes.
			Mean Daily Value. Weekly Average.	Departure from Mean of 40 years.																		
			°C.	°C.																		
Oct.	1891.	40	...	...	...	18	3	4	7	20	4	2	8	45	64	1	1	5	16	2	6	606
		41	13·6	+3·8	...	13	3	8	4	19	6	1	8	38	71	–	8	5	24	–	7	603
		42	12·3	+3·8	...	16	2	7	2	21	9	2	10	32	64	4	5	3	20	3	10	569
		43	5·4	−2·0	...	16	5	8	5	13	5	–	11	33	69	6	1	6	34	1	3	583
Nov.		44	2·9	−3·1	...	22	3	8	7	16	17	1	15	49	78	3	6	4	33	1	7	606
		45	3·3	−1·0	5	24	1	9	5	22	19	2	16	68	95	3	12	5	29	1	12	714
		46	6·9	+4·2	36	24	5	8	4	26	21	1	26	86	120	10	10	8	26	2	7	783
		47	2·7	−0·2	61	26	2	9	5	22	24	3	34	104	115	4	16	3	26	1	10	846
Dec.		48	4·3	+2·9	88	33	2	8	5	16	37	3	42	116	101	8	6	2	19	2	16	908
		49	5·8	+4·4	80	25	4	15	6	21	23	3	39	92	106	5	17	5	31	1	15	835
		50	1·3	−0·3	73	21	2	14	6	25	17	3	23	85	94	3	11	9	27	2	9	746
		51	−0·7	−0·7	44	19	2	7	5	23	17	4	30	81	114	4	18	8	24	4	8	765
		52	2·8	+2·8	[34]	22	2	8	10	21	16	1	27	81	94	6	16	5	27	3	11	746
Jan.	1892.	1	0·9	+1·5	[39]	22	5	7	9	23	13	1	26	69	91	6	11	10	37	1	17	723
		2	−4·2	−3·1	32	23	–	7	4	18	25	1	23	63	100	4	9	11	21	1	7	680
		3	−7·4	−7·1																		

TABLE XXI. Vienna, 1891, 1892.

Cases of Influenza and Mortality from other Diseases.

Week.		Meningitis and Cerebral Inflammation.	Apoplexy.	Inflammatory Diseases of Organs of Respiration.	Emphysema.	Tubercle of Brain and Meninges.	Tubercle of Lungs.	Puerperal Fever.	All Causes.	Influenza (Cases).
Oct.	1891. 40	27	11	41	5	3	114	1	487	
	41	38	9	64	10	6	96	–	536	
	42	22	11	63	10	3	96	2	465	
	43	24	14	61	7	4	114	1	520	
Nov.	44	33	13	61	8	4	106	–	512	
	45	34	10	68	6	3	132	2	576	1
	46	30	14	109	17	3	116	3	630	–
	47	34	15	94	10	4	129	–	612	–
Dec.	48	24	17	104	11	10	115	1	589	3
	49	24	14	92	13	8	124	1	610	1
	50	46	20	122	11	8	110	4	662	14
	51	39	19	133	15	2	113	3	694	98
	52	52	16	211	17	3	127	7	818	311
Jan.	1892. 1	40	11	242	23	3	141	–	850	532
	2	32	13	243	27	2	162	2	870	532
	3	30	15	198	16	2	142	2	778	500

TABLE XXII. (A) London, Berlin and Stockholm, 1890, 1891, 1892.

Percentage Mortality from Influenza at Different Ages.

	Ages.							All Ages.
	0–1	1–5	5–20	20–40	40–60	60–80	80–	
BERLIN, 1891. Month of November .	6	6	1	9	26	41	11	100
LONDON, 1890. 6 weeks, 2nd–7th . .	5	4	4	26	38	20	2	100
LONDON, 1891. 10 weeks, 17th–26th .	5	6	5	15	26	37	6	100
STOCKHOLM, 1892. 1st 2 weeks	7	6	1	6	15	47	19	100

(B) Paris, 1892.—1st 3 Weeks.

Percentage Mortality from Influenza at Different Ages.

Ages.						All Ages.
0–1	1–5	5–20	20–40	40–60	60–	
1	3	2	14	25	54	100

(C) Copenhagen, 1892.—1st 3 Weeks.

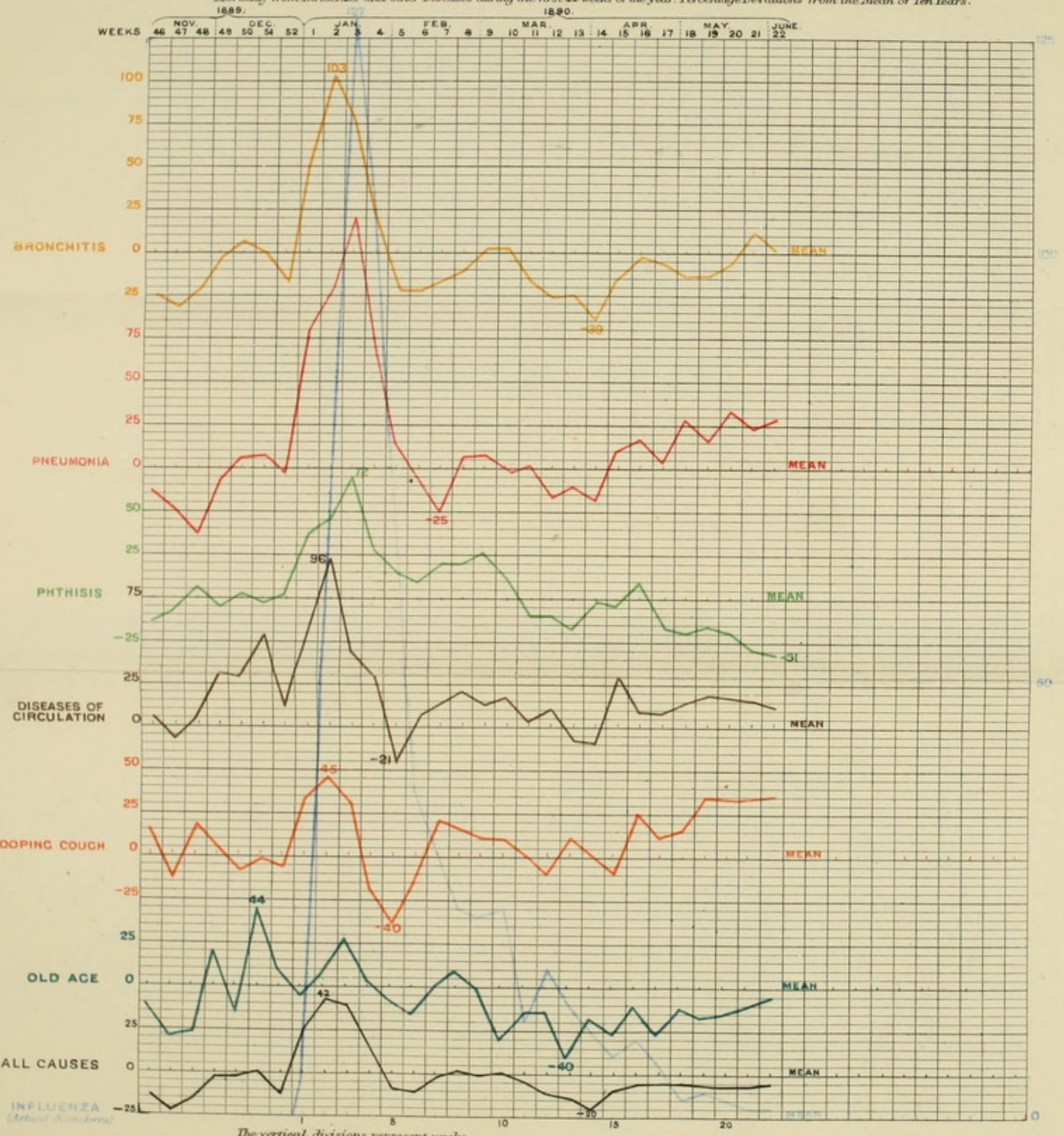
Percentage of Influenza Cases at Different Ages.

Ages.					All Ages.
0–1	1–5	5–15	15–65	65–	
2	11	11	69	8	100

Fig. 1.

LONDON, 1890.

Mortality from Influenza and other Diseases during the first 22 weeks of the year. Percentage Deviations from the Mean of Ten Years.



The vertical divisions represent weeks.
The horizontal divisions represent departures from the average mortality of the previous ten years; each division corresponding to an excess or defect of five per cent.
The Influenza curve represents the actual number of deaths; each horizontal division corresponding to a single death.

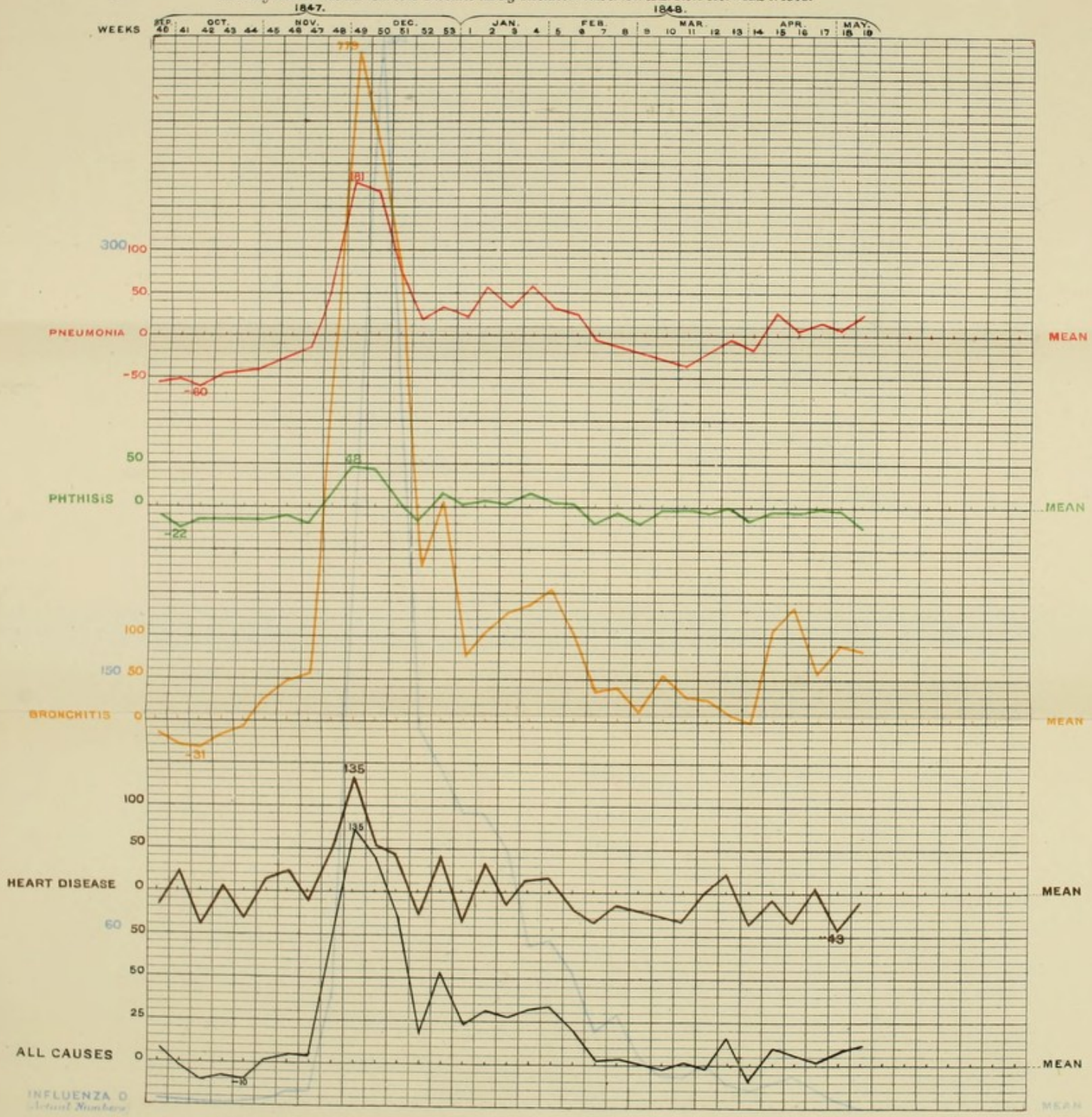
F.A.D. del.

Drawn on Influenza, Clarendon Press

Fig. 2.

LONDON, 1847-8.

Mortality from Influenza and other Diseases during the last 14 weeks of 1847 and the first 19 weeks of 1848.



The vertical divisions represent weeks.
The horizontal divisions represent departures from the average mortality of the previous 5 years, each division corresponding to an excess or defect of 10 per cent. (In "All Causes" 5 per cent.)
The Influenza curve represents the actual number of deaths, each horizontal division corresponding to three deaths.

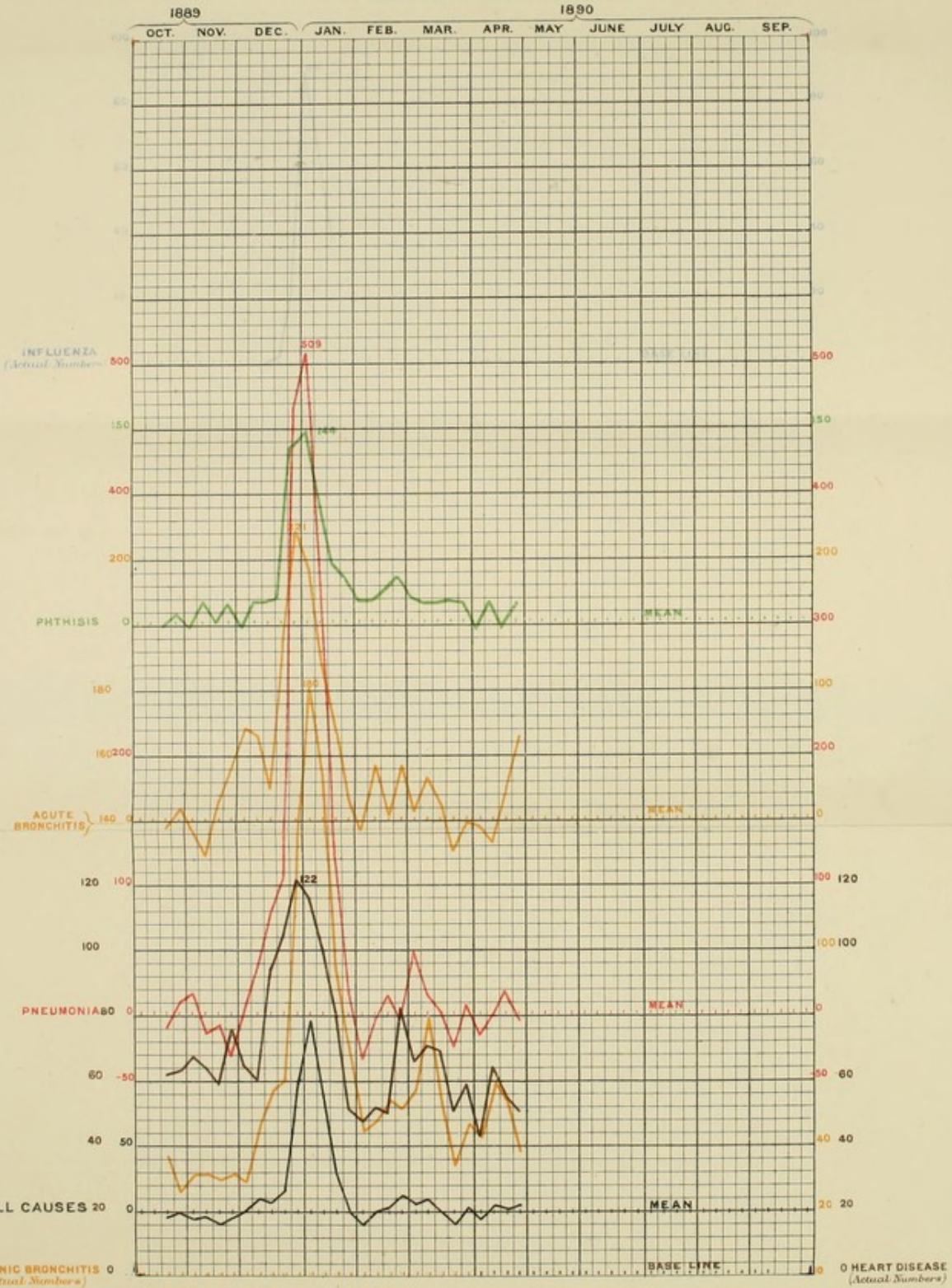
F.A.D. del.

Dizey on Influenza, Clarendon Press.

Fig. 3.

PARIS; 1889,1890.

Mortality from Influenza and other Diseases.



The vertical divisions represent weeks.

The curves of Phthisis, Acute Bronchitis, Pneumonia and All Causes represent percentage departures of mortality from the mean of the past 5 years. The curves of Influenza, Chronic Bronchitis and Heart Disease represent the actual number of deaths.

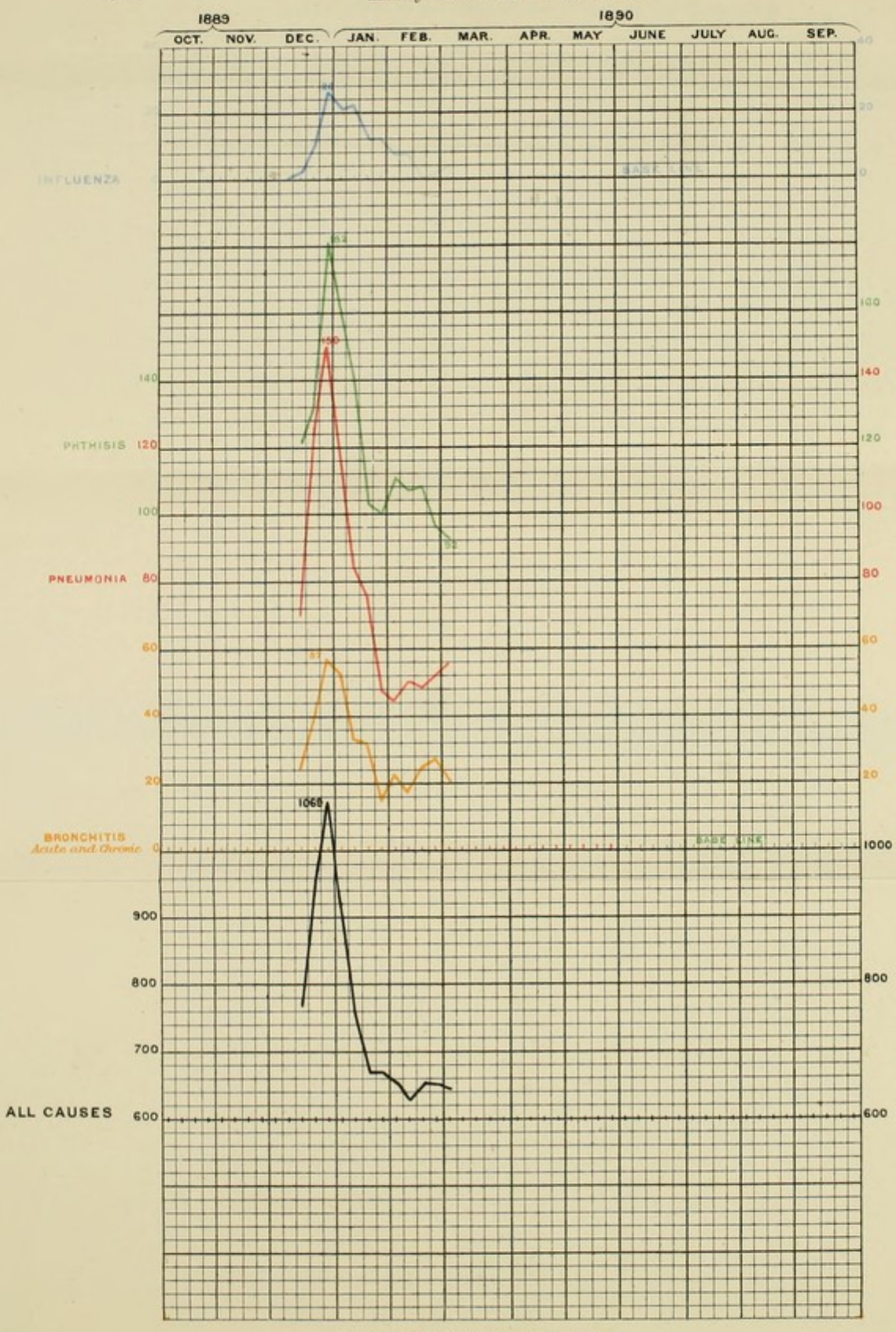
F.A.D del.

Dixey on Influenza; Clarendon Press.

Fig. 4.

BERLIN, 1889, 1890.

Mortality from Influenza and other Diseases.



The vertical divisions represent weeks.

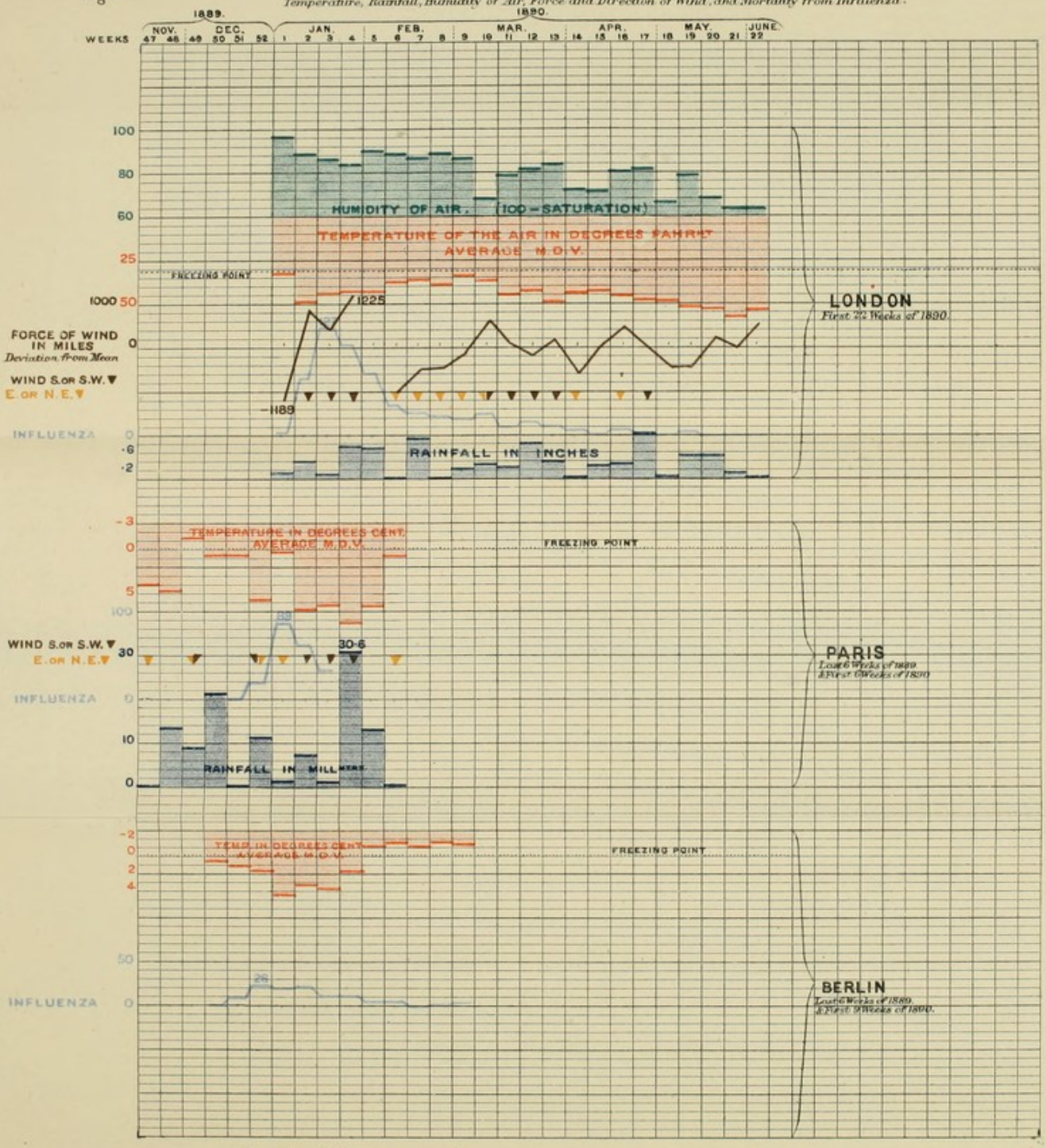
The curves represent the actual number of deaths.

F.A.D. del.

Fig. 5.

LONDON, 1890. PARIS AND BERLIN, 1889, 1890.

Temperature, Rainfall, Humidity of Air, Force and Direction of Wind, and Mortality from Influenza.



The vertical divisions represent weeks.
The Temperatures are the weekly averages of the mean daily values. They are to be read downwards. For London each horizontal division represents 5° Fahrenheit; for Paris and Berlin 1° Centigrade.
In the London Rainfall, each horizontal division represents 0·2 inch. In the Paris Rainfall each horizontal division represents 2 millimètres.

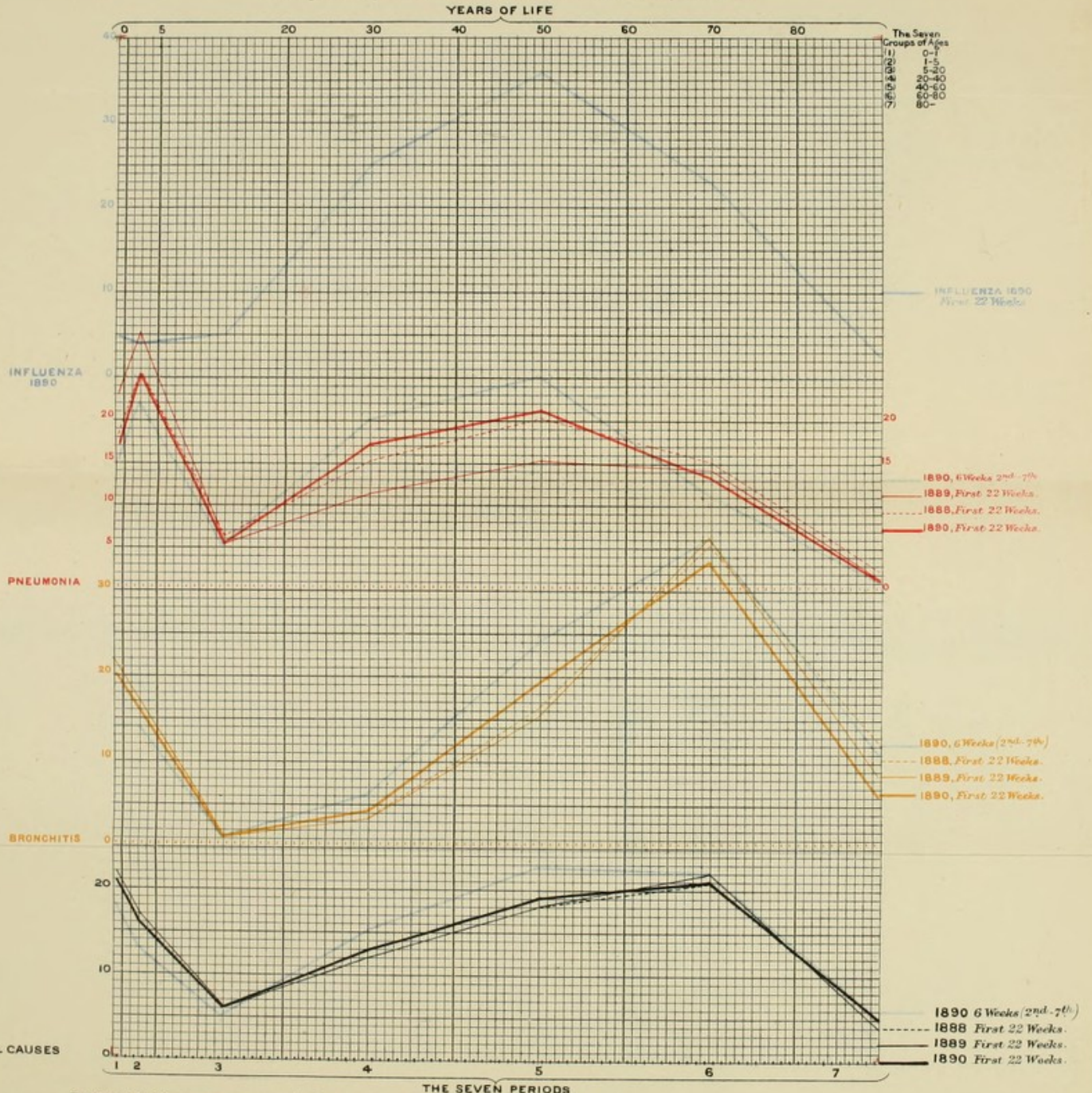
F.A.D. del.

Dixey on Influenza, Clarendon Press.

Fig.6

LONDON, 1888-9,1890.

Percentage Mortality from Influenza and other diseases at different periods of life.



The vertical divisions represent years of life, They are collected into 7 periods or groups of ages.
The horizontal divisions represent the percentage mortality, each division corresponding to 1 per cent of the whole.
In the three lower curves, the pale blue lines correspond to the period when Influenza was at its greatest intensity; the deeply coloured lines to the period when Influenza was generally prevalent; the faint lines to similar periods in ordinary years, when there was no Influenza.

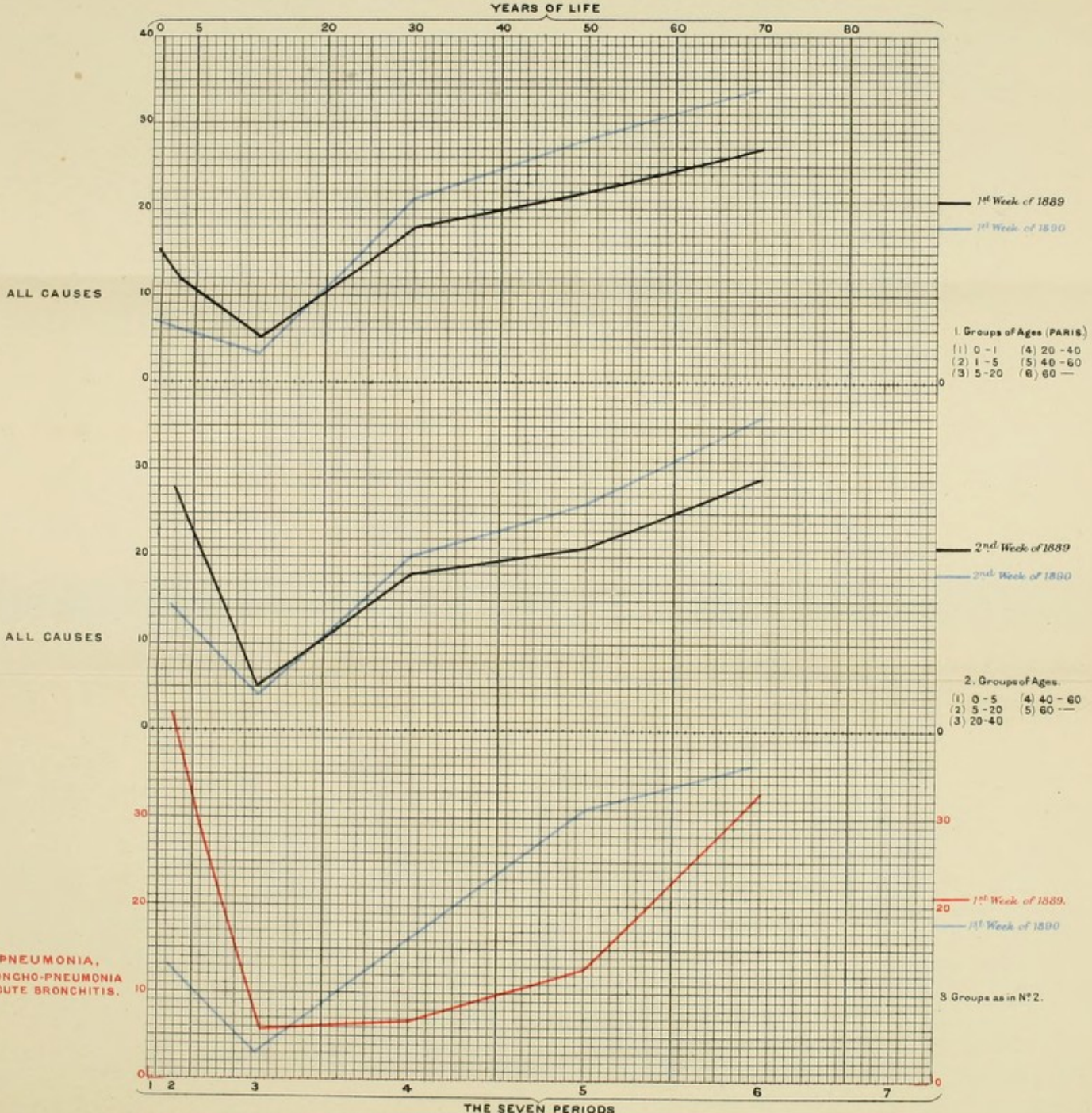
F.A.D. del.

Dixey on Influenza, Clarendon Press.

Fig. 7.

PARIS, 1889, 1890.

The first weeks of 1890 compared with those of 1889 in respect of the mortality at different ages.



The vertical divisions represent years of life, They are collected into 7 periods or groups of ages.
The horizontal divisions represent the percentage mortality, each division corresponding to 1 per cent. of the whole.
The three blue curves correspond to the period when Influenza was prevalent.
The other curves to similar periods in ordinary years, when there was no Influenza.

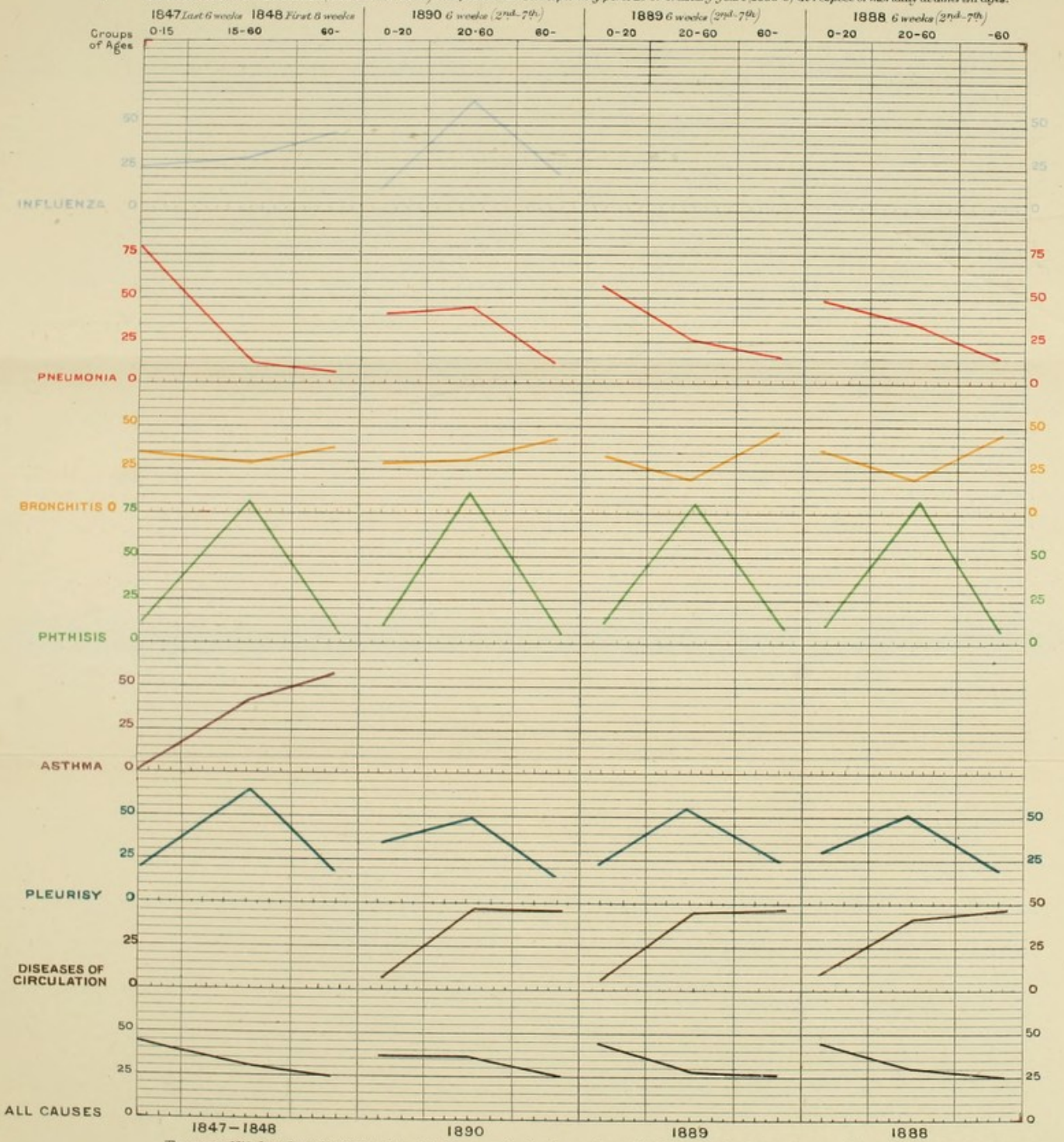
F.A.D. del.

Dixey on Influenza, Clarendon Press.

Fig 8.

LONDON, 1847-8, 1888-9, 1890.

Periods of Prevalent Influenza (in 1847-8-1890) compared with corresponding periods of ordinary years (1888-9) in respect of mortality at different ages.



The years of life have been divided into 3 periods, These are, in the first column (1847-1848) 0-15, 15-60, 60; in the remaining columns 0-20, 20-60, 60-.
The vertical divisions separate the periods.
The horizontal divisions represent the percentage mortality, each division corresponding to 5 per cent of the whole.

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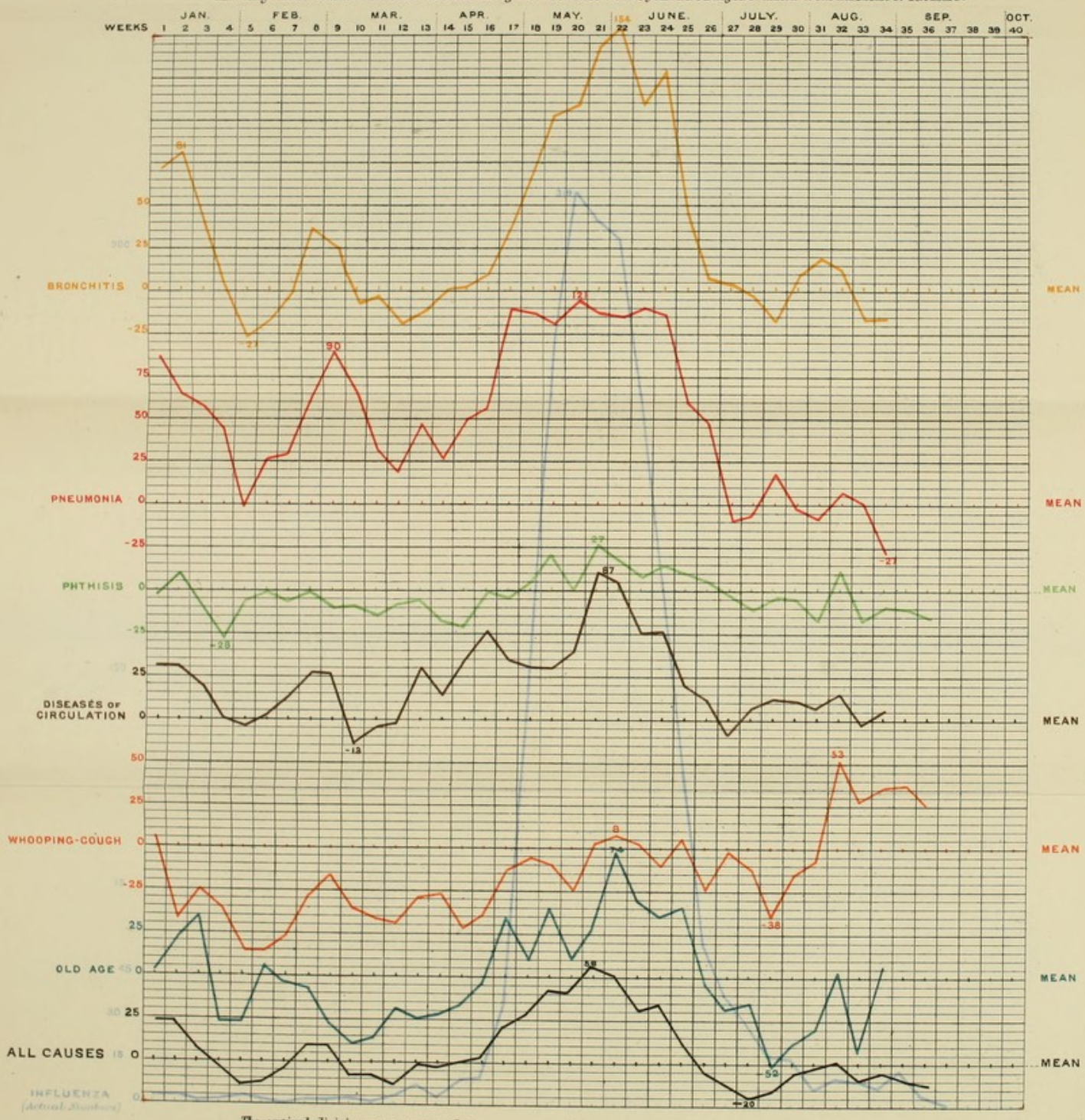
Dicey on Influenza, Clarendon Press.

Fig. 9.

LONDON, 1891.

Mortality from Influenza and other Diseases during the first 34 weeks of the year. Percentage Deviations from the Mean of Ten Years.



The vertical divisions represent weeks.
The horizontal divisions represent departures from the average mortality of the previous 5 years; each division corresponding to an excess or defect of 5 per cent.
The Influenza curve represents the actual number of deaths, each horizontal division corresponding to three deaths.

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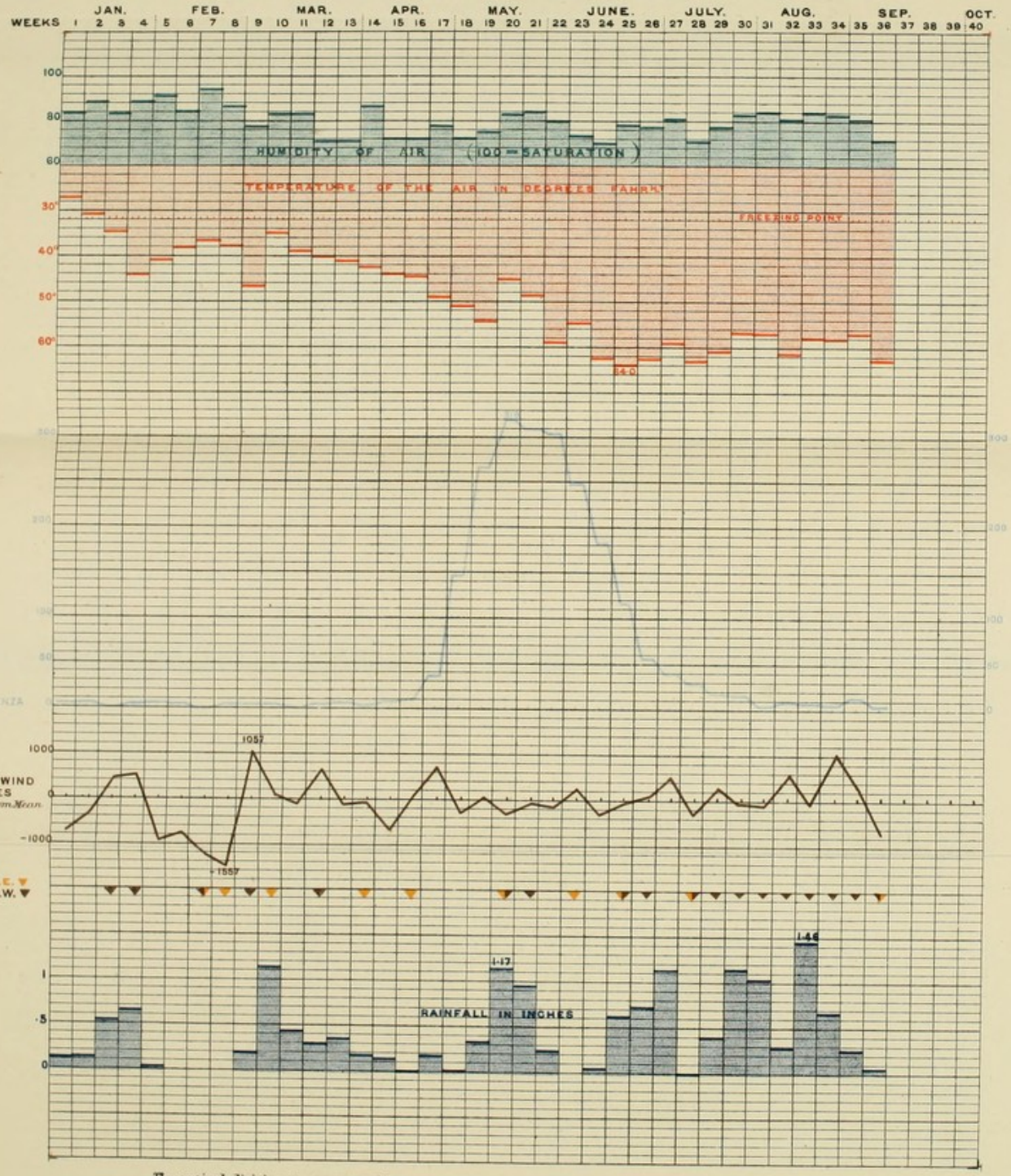
Fig. 10.

LONDON, 1891.

Temperature, Rainfall, Humidity of Air, Force and Direction of Wind, and Mortality from Influenza.



The vertical divisions represent weeks.
The Temperatures are the weekly average of the mean daily values. They are to be read downwards, each horizontal division corresponding to 2° Fahrenheit.
In the Rainfall each horizontal division indicates 0·1 inch.

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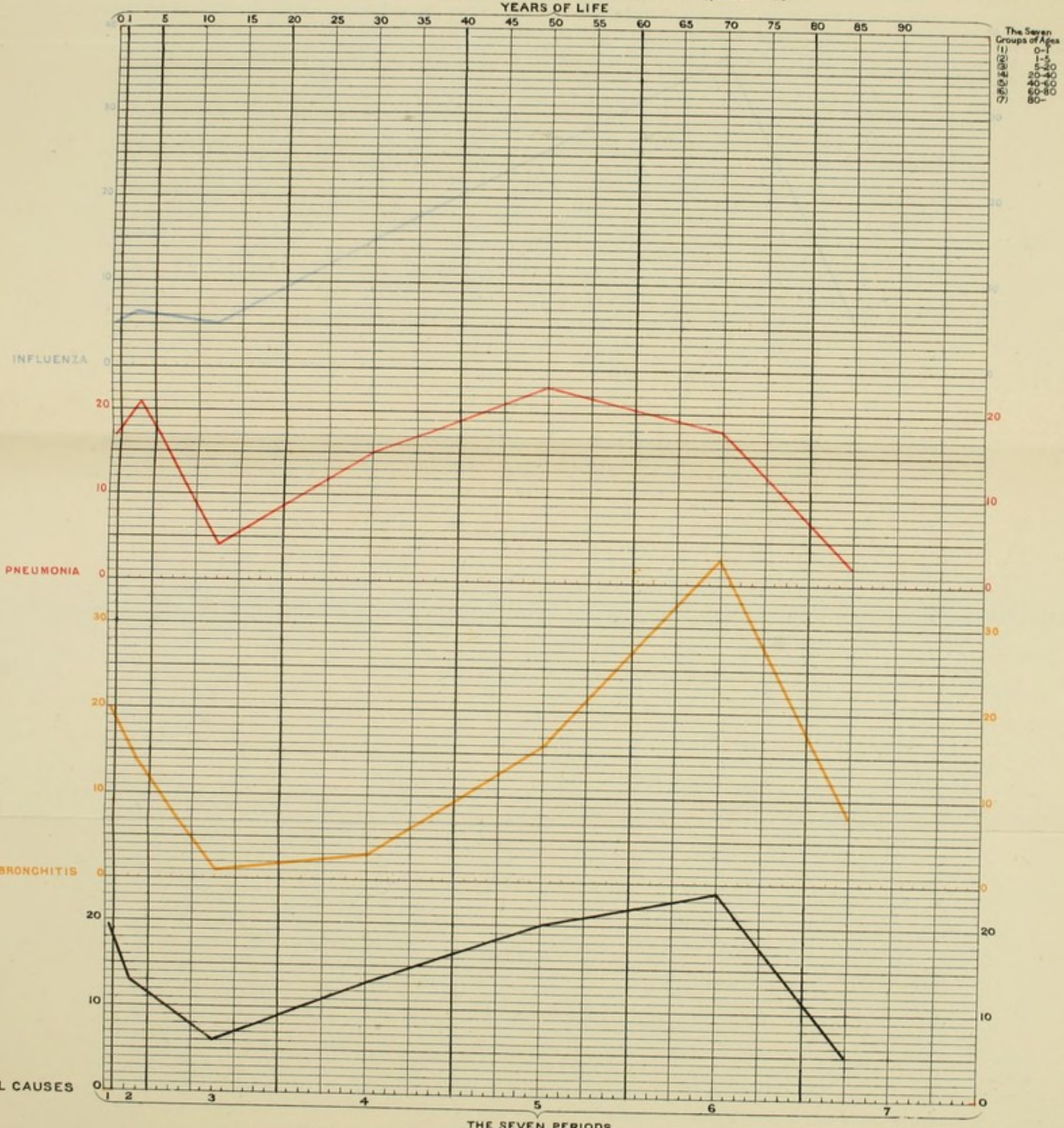
Fig. II.

LONDON, 1891.

Ten Weeks, 18th-27th

Percentage Mortality from Influenza and other diseases at different periods of life



The vertical divisions represent years of life, They are collected into 7 periods or groups of ages.
The horizontal divisions represent the percentage mortality, each division corresponding to 1 per cent. of the whole.

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