

Report on the influenza epidemic of 1889-90 / by Dr. Parsons.

Contributors

Parsons, H. Franklin 1846-1913.
Great Britain. Local Government Board.

Publication/Creation

London : Printed for H.M.S.O. by Eyre & Spottiswoode, 1891.

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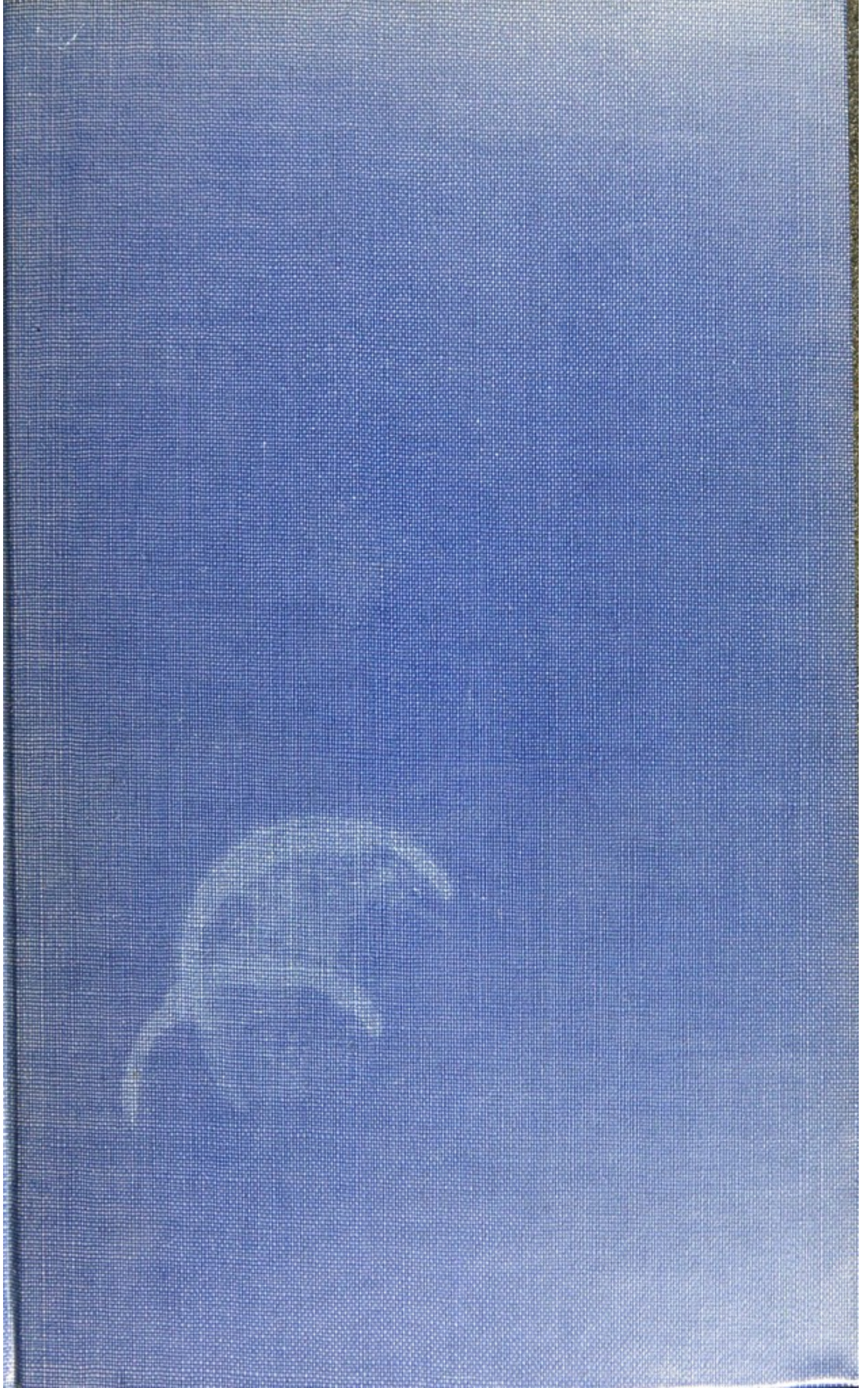
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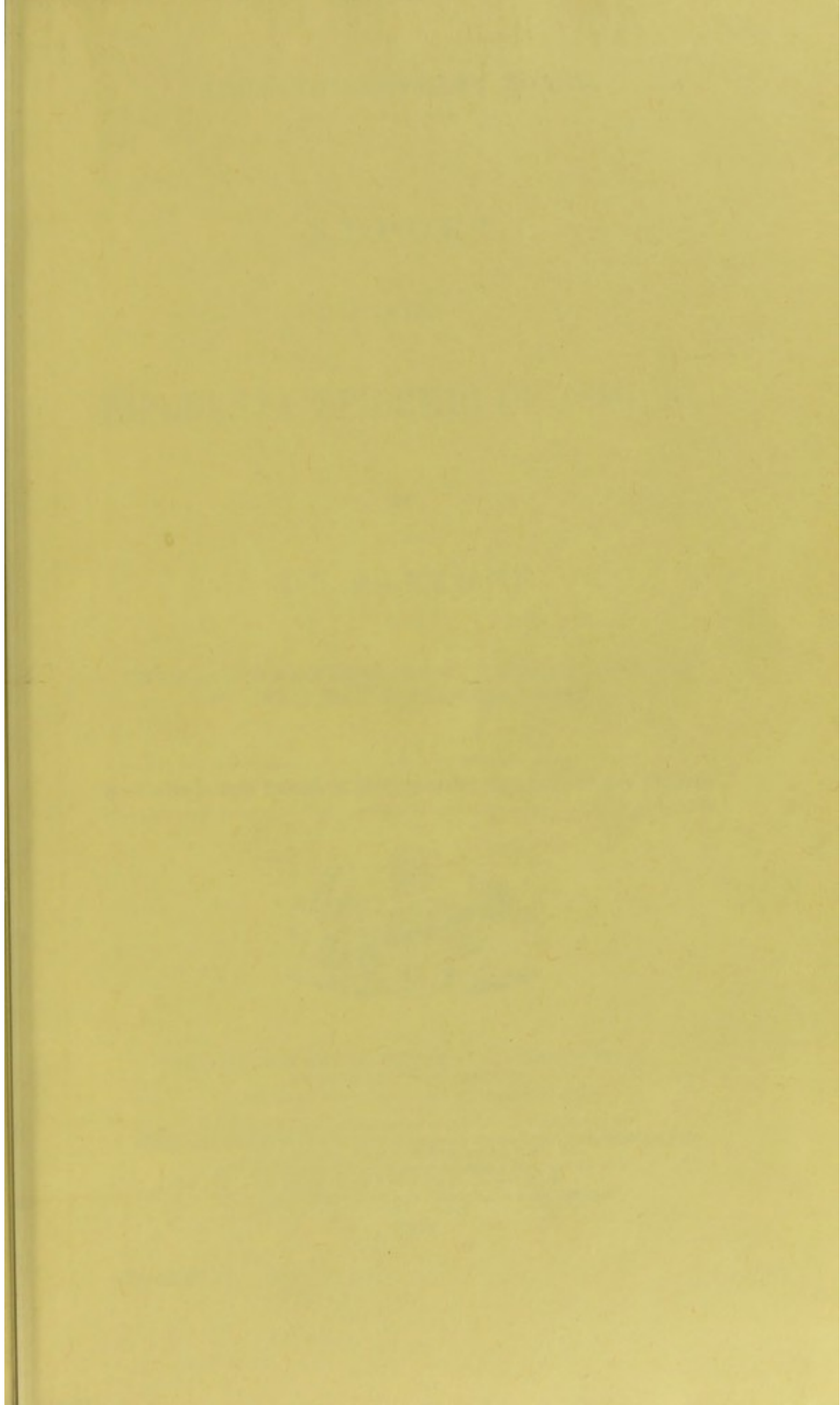
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LOCAL GOVERNMENT BOARD.

REPORT

ON THE

INFLUENZA EPIDEMIC OF 1889-90.

BY

DR. PARSONS.

WITH AN INTRODUCTION BY THE MEDICAL OFFICER
OF THE LOCAL GOVERNMENT BOARD.

Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:

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1891.

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REPORT

INFLUENZA EPIDEMIC OF 1889-90



DR. PARSONS

WITH AN INTRODUCTION BY THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD

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INTRODUCTION BY THE MEDICAL OFFICER.

TO THE RIGHT HONOURABLE CHARLES THOMSON
RITCHIE, M.P., PRESIDENT OF THE LOCAL
GOVERNMENT BOARD.

SIR,

I HAVE to present a report by Dr. Parsons, of the Medical Department, upon the prevalence of Epidemic Influenza in England and Wales during the years 1889-90. It forms a worthy addition to the excellent monographs on Influenza that have been contributed to English medical literature.

Dr. Parsons's
Report on
Influenza.

Dr. Parsons does not strictly confine his report to the epidemic of our own country, but he tells us what he has been able to learn of the epidemic elsewhere. In thus treating of the history and geography of recent Influenza, his report may be compared with the records of earlier epidemics. But Dr. Parsons has been able, probably on better evidence than any previously adduced, to deal with the problems offered by the different behaviour of the malady in one and another locality of England and Wales. He has derived his abundant and detailed materials from a great number of medical practitioners, among whom Medical Officers of Health are naturally foremost.

The matter which exercised the public mind throughout last year was the Source of Influenza. As to this, I fear that, to many people, the report will be disappointing. The universal desire in every country appears to have been to accuse another country of generating the epidemic; accusing by preference the more distant ones. Russia, among European countries, has been held to have originated the disease, it would seem on no better ground than the early date of its prevalence in Russia. China, among still more distant countries, has had the credit of being the birthplace of Influenza: it would seem because some great Chinese rivers overflowed their banks in 1888 and 1889.

Origin of the
disease.

Manner of
extension.

But what appears much more important than the origin of the epidemic, is the evidence that Dr. Parsons has gathered, tending to a better knowledge of the manner of extension of Influenza. The disease has long been regarded as of the "miasmatic" group; of that group, namely, wherein pathologists and statisticians comprise the common infectious diseases of our own and other countries. But probably no evidence has ever been put on record, in such abundance as that accumulated in Dr. Parsons's report, to show that in its epidemic form Influenza is an eminently infectious complaint, communicable in the ordinary personal relations of individuals one with another. It appears to me that there can henceforth be no doubt about the fact.

In some circumstances it would seem that infectiveness of Influenza through the atmosphere shows itself over a wider area than the limits of household life. Probably also there are other less direct ways by which the infection of the disease can travel; and ways, moreover, by which the infection can be retained for a time in a state of suspended activity. These characters observed in the extension of epidemic Influenza would appear to be little else than we are familiar with in the behaviour of other diseases, of the infective class. But we have no doubt much to learn about the dissemination of Influenza; and particularly of the stage when the complaint acquires its epidemic power.

Specialities of
Influenza
extension.

By having established a place for this Influenza among infectious diseases, we assert a position for the disorder within a class of diseases over which we habitually exercise a measure of control. But from what we have thus far seen of the specialities of Influenza, we cannot feel particularly confident of our ability, under the existing conditions of society, to successfully defend ourselves against a further outbreak. A disease that can be absent in an epidemic form for 30 years together cannot, even if a first attack confer immunity, avail to give the protection of a first attack to any large part of a population. Early isolation precaution, applicable perhaps to children suspected to have measles, cannot well be applied to persons suspected of Influenza among the bread-winners of a community; and the singular ability possessed by Influenza to disperse itself over a population, owing to its brief incubation

period, must add to the difficulties of dealing with an infection that finds the bulk of the population susceptible to its attack. Having, as would seem, something like a third part of the incubation time proper to small-pox, measles, or typhus, Influenza has correspondingly rapid ability to reproduce itself; can, that is, give rise to some thousand attacks in the time that small-pox or typhus had taken to produce ten; each of the thousand cases being ready to infect other susceptible people, and the difficulty of applying principles of isolation and disinfection being in like measure enormously enhanced.

For better means of repressing Influenza our expectation must be in an understanding of the natural history of the disease. Even for immediate purposes, it would be no small gain to get more authentic methods of identifying Influenza proper from among the various grippe, catarrhs, colds, and the like—in man, horse, and other animal—that take to themselves the same popular title: so we might get earlier opportunity for applying such preventive measures as we now possess, instead of delaying our procedures until obscure cases have multiplied and the disease prevails in its more definite form: until the time, namely, of major abundance with perhaps a faculty of readier dissemination. For the rest, better understanding of the natural history of Influenza has to be obtained—with insight into the characters, habits, and conditions of multiplication of its material,—with a view to acquiring by other methods further and better safeguards against the disease.

Need for
further
information.

I have the honour to be,

Sir,

Your obedient Servant,

GEORGE BUCHANAN.

May 30th, 1891.

R E P O R T
ON THE
INFLUENZA EPIDEMIC OF 1889-90.

BY
DR. PARSONS.

THE winter of 1889-90 will be memorable for having witnessed the return in an epidemic form, after an interval of 43 years, of the historical disease known by the name of "Influenza";* a disease not indeed very fatal, as an immediate cause of death (though the indirect cause of a considerable mortality), but of importance as occasioning much pain and disablement to the considerable proportion of the community who became its victims, as well as giving rise to much inconvenience in establishments, institutions, and public services of various kinds, owing to the large number of persons often disabled by it at one time.

On Epidemic
Influenza in
1889-90; by
Dr. Parsons.

As this epidemic of Influenza was the first that had visited this country since the establishment of a central health authority, the occasion was deemed to call for a somewhat extended official inquiry on behalf of the Local Government Board into the behaviour and causes of this obscure but interesting disease, in the hope of throwing light upon the various unsettled problems connected with its etiology.

To this end among other means a circular was sent out to the Medical Officer of Health of each sanitary district (rural, urban, or port), in England and Wales (1,777 in all), asking for replies to a printed form of queries. Communications were also entered into with other Government Departments, and with railway companies and other public or quasi-public bodies, from whom much valuable information was obtained. Information from private sources was also invited by letters in the medical journals. Local inquiries into several early outbreaks of Influenza or similar disease in village communities were made by Dr. Bruce Low; and the circumstances of outbreaks in several institutions were inquired into by myself.

I.—PREVIOUS HISTORY.

It is not attempted in this report to give a history of the previous occurrences of Influenza in this or other countries. Those in this country, from 1510 to 1837, have been fully described by Dr. Theophilus Thompson in his "Annals of Influenza in Great Britain" (Sydenham Society, 1852), and that in 1847 by Dr. Peacock. Hirsch, in his "Geographical and Historical Pathology," published by the same society, gives a list of epidemics of Influenza in different countries ranging from 1173 to 1875 A.D. The history of the recorded outbreaks prior to 1510 has been traced by Dr. F. G. Clemow, in a paper read in 1890 before the Society of Medical Officers of Health, who quotes a number of instances of what were with more or less probability epidemics of Influenza, between the years 877 and 1481 A.D., as well as a few doubtful earlier instances, as far back as the time of Hippocrates.

Previous
epidemics.

* Throughout this report the word Influenza (with a capital I) refers to the epidemic disease. The cases called by the same name in non-epidemic years are referred to as "influenza," in inverted commas, as is also the similar disease among horses.

On Epidemic
Influenza in
1889-90; by
Dr. Parsons.

CHAP. I.

In the present century epidemics have occurred in this country in 1803, 1833, 1837-8, and 1847-8.

Dr. Gairdner, of Glasgow, has recorded what he considers a quite unequivocal though mild epidemic of Influenza in Scotland in 1857.

The late Dr. Handfield Jones, in a clinical lecture published in the "British Medical Journal" of July 23rd, 1870, describes a case of "influenza," and mentions others occurring apparently about that time, and considered to be due to an "influenza miasm." The symptoms, however, in the case described are quite unlike those of the recent epidemic.

Influenza is said to have been epidemic in Iceland in 1855 and 1862,* in Philadelphia in 1870, and in Fiji in 1876-7. (As to Fiji, see p. 49.)

Sir Peter Eade ("Lancet," 1878, I., 378), states that "influenza" was prevalent in Norfolk in 1878. This, however, differed from previous epidemics of Influenza in the frontal oppression and true catarrhal symptoms being generally less marked, and in many cases "a bad cold" was the most noticeable feature of the disorder; but in a large proportion cough—either dry and irritable, or with some expectoration, rarely abundant—was a more prominent symptom. Languor and depression were in all cases much complained of, and there was a peculiar damp perspiring condition of the skin. The invasion was sudden, with more or less chilliness. Several members of a family, or the whole household, were often affected, though with varying degrees of severity, the earlier cases being the severest. The season (February and March) was damp and mild, with prevailing westerly winds.

In February 1887 an outbreak of an unknown infectious disease in the town and neighbourhood of Northallerton, Yorkshire, was reported on to the Local Government Board by the late Dr. Page, who considered that the disease in question presented a relationship, if not actual identity, with the epidemic Influenza. Of the symptoms as described, the earliest were an almost incessant short irritable dry cough and soreness of the throat, with congestion of the pharynx, but no enlargement of the tonsils. Initial chilliness, headache, muscular pains, and marked depression, whether nervous or muscular, seem to have been absent. About the third day of the disease the temperature suddenly rose above the normal (in one case reaching 105° F.), and it continued high, but with remissions, for two or three days, when it fell rapidly to the normal, profuse perspiration occurring at the same time. Coryza was not a marked symptom, and no bronchial or pneumonic complications were met with; but in some cases there was considerable irritation of the conjunctiva. Children were chiefly attacked. The disease appeared to be infectious, having an incubation period which might extend to a week in length. The disease, as described, seems to have differed from the Influenza of 1889-90 in the absence of frontal headache, muscular pains, nervous depression, and sudden early rise of temperature.

*Registered Mortality from Influenza in England and Wales
since 1837.*

Registered
mortality from
Influenza in
previous years,

The deaths from "influenza" in England and Wales and in London, so far as recorded in the Registrar-General's reports since the commencement of civil registration, are given in the accompanying Tables A. and B. together with the mean temperature at Greenwich of the year and the quarters, and in Table A. the death-rates from diseases of the organs of respiration and circulation.

* Hjaltelin. "Edinburgh Medical Journal." May 1866.

TABLE A.
ENGLAND AND WALES.

On Epidemic
Influenza in
1889-90; by
Dr. Parsons.

CHAP. I.

in England and
Wales,

Year.*	Mean Annual Tempera- ture.	Deaths from "Influenza."			Death-rates per million Population from		
		Males.	Females.	Total.	"In- fluenza."	Diseases of Respiratory Organs.	Diseases of Circulation.
1847	49.1	2,215	2,666	4,881	285	2,980	580
1848	50.2	3,810	4,153	7,963	460	2,587	556
1849	50.0	738	873	1,611	92	2,536	618
1850	49.3	673	707	1,380	78	2,184	637
1851	49.2	967	1,185	2,152	120	2,705	657
1852	50.6	632	727	1,359	76	2,646	699
1853	47.7	862	927	1,789	99	3,118	760
1854	48.9	525	536	1,061	58	2,856	734
1855	47.1	1,676	1,892	3,568	193	3,439	786
1856	49.0	474	555	1,029	55	2,812	726
1857	51.0	622	771	1,393	73	3,057	775
1858	49.2	851	943	1,794	93	3,399	852
1859	50.7	536	576	1,112	57	3,069	879
1860	47.0	552	578	1,130	58	3,484	956
1861	49.4	365	381	746	38	3,233	909
1862	49.5	438	477	915	45	3,358	930
1863	50.3	429	490	919	45	3,308	959
1864	48.5	410	394	804	39	3,363	1,089
1865	50.3	294	302	596	29	3,369	1,072
1866	49.8	316	335	651	31	3,678	1,056
1867	48.6	284	323	607	29	3,402	1,074
1868	51.5	153	153	306	14	2,939	1,051
1869	49.5	332	371	703	32	3,704	1,147
1870	48.7	304	311	615	28	3,690	1,134
1871	48.7	158	190	348	15	3,569	1,177
1872	50.7	132	146	278	12	3,147	1,193
1873	48.9	131	135	266	11	3,632	1,244
1874	49.3	109	136	245	10	3,797	1,289
1875	49.2	218	231	449	19	4,282	1,381
1876	50.1	103	100	203	8	3,656	1,333
1877	49.4	102	103	205	8	3,656	1,333
1878	49.6	101	94	195	8	3,230	1,445
1879	46.2	121	145	266	11	4,333	1,513
1880	49.4	85	86	171	7	3,614	1,372
1881	48.7	50	49	99	4	3,427	1,369
1882	49.7	43	47	90	3	3,555	1,372
1883	49.4	47	60	107	4	3,656	1,465
1884	50.7	37	35	72	3	3,317	1,495
1885	48.6	66	72	138	5	3,699	1,597
1886	48.7	42	41	83	3	3,594	1,625
1887	47.8	41	44	85	3	3,572	1,643
1888	47.7	49	43	92	3	3,441	1,666
1889	48.8	29	26	55	2	3,355	1,632

* The causes of deaths in England and Wales were not tabulated for the four years 1843-46. In the five years 1838-42, the deaths ascribed to "influenza" were as follows:—

Year.	Deaths from "Influenza."	Rate per million Population.
1838	806	55
1839	887	59
1840	1,030	67
1841	1,659	106
1842	883	53

TABLE B.

LONDON.—DEATHS FROM INFLUENZA.

Year.	Mean Temperature of				Deaths from Influenza.				Total.
	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	
1840	-	-	-	-	22	14	12	23	71
1841	-	-	-	-	146	57	8	13	224
1842	-	-	-	-	32	19	13	15	79
1843	-	-	-	-	28	21	18	40	107
1844	-	-	-	-	66	28	8	32	134
1845	-	-	-	-	34	11	8	20	73
1846	43·6	55·2	63·1	44·2	22	21	6	66	115
1847	37·2	52·2	61·3	47·4	63	23	6	1,161	1,253
1848	40·9	55·3	59·5	46·6	578	50	7	21	659
1849	41·9	51·7	61·0	44·8	53	16	9	49	127
1850	39·4	53·5	59·6	44·7	38	36	9	26	109
1851	41·9	51·5	59·8	43·7	205	108	7	34	354
1852	41·4	51·2	61·8	48·1	40	33	3	41	117
1853	38·1	51·8	58·5	42·3	51	22	6	33	112
1854	40·8	51·7	59·8	43·7	27	37	8	31	103
1855	34·1	50·5	60·4	42·7	132	19	8	9	168
1856	40·0	52·3	59·9	44·3	25	9	-	18	52
1857	39·2	53·8	63·3	47·9	28	8	-	100	136
1858	37·8	54·3	61·0	43·8	50	16	4	29	99
1859	43·3	53·7	62·8	43·3	30	14	4	14	62
1860	38·8	50·5	56·2	42·6	54	34	5	20	113
1861	39·9	51·8	60·4	45·5	16	7	4	19	46
1862	41·0	53·3	58·8	45·0	29	9	1	6	45
1863	42·6	53·1	58·8	46·8	24	3	3	11	41
1864	37·9	53·1	59·4	43·7	38	7	4	15	64
1865	36·5	56·2	62·5	46·0	20	6	1	9	36
1866	41·2	53·0	58·9	46·2	13	10	-	14	37
1867	38·9	53·5	59·7	42·5	14	4	5	11	34
1868	41·4	55·8	63·9	45·1	5	5	3	13	26
1869	41·3	52·0	61·4	43·3	21	4	-	14	39
1870	38·0	54·4	60·7	41·6	15	5	1	9	30
1871	40·2	51·5	61·3	41·8	12	5	5	13	35
1872	43·6	52·8	61·1	45·3	10	5	4	2	21
1873	39·4	51·8	60·3	44·2	4	5	-	7	16
1874	41·4	52·8	60·9	42·3	5	2	2	7	16
1875	39·5	53·4	60·7	43·1	16	3	-	2	21
1876	39·5	51·7	61·8	47·0	13	2	1	7	23
1877	42·3	51·9	58·5	45·0	4	7	-	4	15
1878	41·5	54·6	60·8	41·6	5	-	1	3	9
1879	37·2	49·3	58·2	40·7	4	4	1	-	9
1880	39·8	52·8	61·3	43·7	5	1	3	2	11
1881	37·3	52·9	60·0	44·6	5	-	-	3	8
1882	42·8	53·1	58·1	44·7	1	1	1	3	6
1883	40·0	53·0	59·5	44·9	5	5	-	1	11
1884	43·4	52·5	62·7	44·1	2	1	-	3	6
1885	40·3	52·4	59·1	42·8	3	-	-	-	3
1886	36·5	52·5	61·2	44·6	2	1	-	2	5
1887	37·3	51·6	61·0	41·3	-	-	1	4	5
1888	36·9	51·6	57·6	44·6	-	-	-	3	3
1889	38·2	54·5	58·9	43·5	2	1	1	1	5
1890	41·4	52·8	59·4	40·8	558	47	16	27	648

It will be seen that the deaths from "influenza" were most numerous in the earlier part of the series of years, which in Table A. begins with the epidemic of 1847-8; and they had by 1889 diminished to quite insignificant proportions, although a certain number of deaths have been ascribed to this cause every year.

In some of the earlier years of the series after 1848 a rise in the number of deaths from "influenza" is shown, pointing to a recurrence of epidemics on a smaller scale. Examples are met with in 1851, 1855, and 1858. (The Registrar-General mentions that Influenza was epidemic at St. Agnes, Cornwall, in the first quarter of 1855 during severe weather.)

These recurrences would appear to have taken place with some regularity at intervals of about three years, best seen perhaps in Table B.

Thus, adding the previous epidemics, we have the following series, the years of the major epidemics being printed in *italics* :—

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Epidemic Years.	Intervals.
<i>1834</i>	3 years.
<i>1837</i>	3-4 years.
1840-41	3 years.
1843-4	4 years.
<i>1847-8</i>	3-4 years.
1851	4 years.
1855	3 years.
1858	

On comparing in Table A. the death-rate from "influenza" with those from diseases of the lungs and heart, it will be observed that while the former has diminished the two latter have steadily and greatly increased. Into the causes of this increase it is not necessary here to enter, but there is reason to believe it to be partly real, and partly only apparent and due to more accurate certification. But besides this steady and regular increase, an addition to the number of deaths from diseases of the respiratory organs takes place in the years in which Influenza is epidemic, this addition being best seen by observing that the death-rate from these diseases is higher in the Influenza years than in the years immediately following them, although by the progressive increase it should be higher in the latter years than in those preceding them. To a less extent there are indications of a similar addition in Influenza years to the deaths from diseases of the organs of circulation.

Concurrent
increase in
deaths from
chest diseases.

Of the relation between this concurrent increase in the deaths from chest affections, and of the increase in those from "influenza," two views may be taken. On the assumption that a specific Influenza was present in the years in question different from that in other years it may be supposed that the material cause of this specific disease, present but unrecognised or unrecorded, may have had a share in determining the fatal issue in the cases recorded as dying from other diseases,—may, in other words, have turned the scale against those patients who would otherwise have recovered or survived longer. On the assumption that the "influenza" recorded year by year is of the same kind, differing only in amount, it may be supposed that the same conditions, *e.g.*, climatic, which cause an increase in the number of deaths from diseases of the respiratory organs cause also an increase in those recorded as from "influenza."

I am inclined to think that the former explanation may hold good in the epidemic years in the earlier part of the series, and that the latter may account for such trivial increases of the number of recorded deaths from "influenza" as occurred concurrently with a rise in the death-rate from diseases of the respiratory organs in the years 1879, 1883, and 1885.

The following observation made during the recent epidemic by Dr. Niven, Medical Officer of Health for Oldham, goes to corroborate the view that the increased mortality from diseases of the respiratory organs during an epidemic of Influenza is directly due to the effects of the Influenza.

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"The following particulars relate to 50 deaths in Oldham certified to have occurred from bronchitis and pneumonia in the fortnight ending March 8th, 1890, no mention of Influenza being made in the death certificate:—

No. of deaths from bronchitis and pneumonia	-	50
No. of instances in which deceased had symptoms of Influenza	-	11
No. of instances in which Influenza was otherwise present in the house about the time of death	-	10
		<u>21</u>

"In addition during the fortnight ending March 8th, there were 14 death certificates in which Influenza was given as a cause of death."

Age mortality
of epidemic
Influenza
different from
that of "in-
fluenza" in
ordinary years.

A circumstance which tends to show that the epidemic Influenza is a different disease from that which goes by the name of "influenza" in ordinary non-epidemic years is the very marked difference in the incidence of the mortality on persons of different ages. The deaths referred to "influenza" in recent non-epidemic years have been mostly those of persons at the two extremes of life, viz., children, especially those under one year old, and old people. The deaths from Influenza which occurred in London during the recent epidemic have been most numerous at the middle periods of life, viz. between 20 and 40 and between 40 and 60.

The following tables illustrate this:—

I.—DEATHS at DIFFERENT AGES from "INFLUENZA" in LONDON in the 14 Years 1876-89, and in the First Quarter of 1890.

Period.	Age.—Years.							Total.
	Under 1	1-5.	5-20.	20-40.	40-60.	60-80.	80 and above.	
1876-89 - - -	39	19	4	4	12	32	9	119
First quarter 1890 -	29	24	26	138	202	125	14	538

II.—PROPORTION at the SEVERAL AGES to 100 DEATHS from "INFLUENZA" at all AGES, in LONDON.

Period.	Per-centage at several Ages.							Total.
	Under 1.	1-5.	5-20.	20-40.	40-60.	60-80.	80 and above.	
1876-89 - - -	32·8	16·0	3·4	3·4	10·0	26·9	7·5	100
First quarter 1890 -	5·2	4·3	4·7	24·7	36·2	22·4	2·5	100

The same age-incidence of "influenza" mortality in non-epidemic years appears to obtain in England and Wales generally, though as the age-periods adopted by the Registrar-General in his annual reports differ from those in the weekly tables, a quite accurate comparison

cannot be made. In the six years 1883-88, the deaths referred to "influenza" in England and Wales were 577, or about as many as those in London in the first quarter of 1890.

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Their age distribution was as follows:—

0-1.	1-5.	5-10.	10-15.	15-20.	20-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75-85.	85+.	Total.
202	66	12	2	4	17	13	22	24	33	59	107	26	577
							11	11	16	17	54	53	
202	66	18		31			51		130		79		577
Per cent. - 35	11.3	3.1		5.4			8.9		22.6		13.7		100

By dividing certain of the age groups, and uniting others, as shown above, we are able to make an approximate comparison between the above deaths and those in London, and it will be seen that the percentage at different ages is nearly the same in England and Wales as in London. We are thus able to eliminate the effect of any local habit of nomenclature or difference in the age distribution of the population.

Turning now to the last previous great epidemic in London, that of 1847-48, we find the following figures:—

DEATHS FROM INFLUENZA in LONDON 1847-48, at DIFFERENT AGES.

—	Age Groups.							Total.
	0-1.	1-5.	5-20.	20-40.	40-60.	60-80.	80 and above.	
Number - - -	200	249	72	164	362	703	163	1,913
Per-centage at different ages - - - }	10.5	13.1	3.8	8.6	18.5	36.9	8.6	100

The proportion of Influenza deaths at different ages in 1847-48 does not exactly resemble that either in the late epidemic, or in recent non-epidemic years, differing from the former in the greatest proportion of deaths being at a later age-period, viz., between 60 and 80 years; from the latter in not showing the high proportion of deaths in early childhood.

It seemed probable to me that "influenza" in ordinary times being a term of popular, or loose medical, rather than of strict scientific use, the explanation of the greater number of deaths attributed to this cause in non-epidemic years at the extremes of life might be that the deaths were those of children or old people, with obscure catarrhal or feverish symptoms, which, not being medically attended, or at any rate not coming under close medical observation, were ascribed to this conveniently vague cause.

On inquiry at the General Register Office on this point, I was informed by Mr. Humphreys that it was believed that almost all of the deaths ascribed to "influenza" in recent years before 1890 were medically certified (though this point could not be ascertained with certainty without a laborious special inquiry), but that in former years causes of death described as "catarrhal fever," "epidemic catarrh," "feverish catarrh," and even in some cases "coryza," in adults, were

classed under the heading of "influenza." The number of such cases, however, was small, and their exclusion in later years would not account for the decline which has taken place in the deaths from "influenza."

From tables A. and B. we learn that the epidemic of 1847-8, like that of 1889-90, attained its height in London earlier than in the provinces; the greater number of deaths in London being in the former year, in the rest of the kingdom in the latter year, thus:—

	DEATHS FROM INFLUENZA IN		
	England and Wales.	London.	Rest of Kingdom.
1847 - - -	4,881	1,253	3,628
1848 - - -	7,963	659	7,304

II.—HISTORY OF THE EPIDEMIC OF 1889-90.

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ANTECEDENT CIRCUMSTANCES.

The late epidemic of Influenza, like others that have preceded it, reached western Europe by way of the Russian dominions in Europe and Asia.

The first accounts of it reached this country from St. Petersburg in the end of November, but it would seem to have existed there since September, and to have become prevalent in October. Antecedent circumstances.

Before tracing the progress of the epidemic westwards, it will, however, be convenient to mention certain earlier occurrences of epidemic disease which have since transpired.

In 1885 a disease thought to be similar to epidemic Influenza prevailed through a large part of Australasia, and owing to the prevalence in Melbourne at that time of severe fogs, it obtained the local name of "fog fever" ("British Medical Journal," February 22, 1890, page 450). For an account of this disease see following pages (pp. 45-47). "Fog fever" in Australia.

In the summer of 1889, Influenza of a severe type was prevalent in Greenland. It appeared in May and rapidly spread among the inhabitants, but by the end of summer it became milder or disappeared altogether. Influenza in Greenland

It appears from a Danish official report, translated by the British Consul at Copenhagen, that at Greenland the winter of 1888-89 was less cold, but more unsettled and stormy than usual. In North Greenland the ice broke up early, so that at the beginning of May the coast about Disco Bay was clear, which is quite unusual. The seal fishery was much interfered with by the unsettled weather of the autumn and winter; the shark fishery at Jacobshaven and Umanak, where it is of great importance to the inhabitants, proved unprofitable. Foxes were taken with difficulty on account of the deep snow, and the yield of skins was poor; bear-hunting also was of small importance, as the dogs, on which success principally depends, were suffering from disease.

In May 1889, a complaint resembling Influenza prevailed in Athabasca and other districts in the north-west of British North America. The Rev. W. D. Reeve, then residing as a missionary at Fort Chipewyan, states* that it was brought thither from Lac la Biche, a place 300 or 400 miles distant, by a boat's crew of Indians and half-breeds. One of the crew died on reaching Chipewyan, and the disease spread through the whole community, affecting nearly everybody, Indians, half-breeds, whites, young and old, some very severely; and several deaths occurred. Those most severely affected complained of sore bones, great weakness and prostration, loss of appetite, and bad cough. and Athabasca in 1889.

Epidemic Influenza was present in Bokhara in May 1889, as mentioned below.

In September and October the disease called dengué, which in many respects closely resembles Influenza, was very prevalent in Constantinople, Smyrna, Jaffa, and other places in the east Mediterranean coast. Dengué.

Prior to the epidemic of Influenza in London, and some other parts of England, and also in some continental countries, there has been a prevalence among horses of a disease termed "influenza." In certain large stables in London numerous horses were affected by this disease in October 1889, some six weeks before the human epidemic made its Horse "influenza,"

* "Standard," January 14th, 1890.

appearance. The relations between this equine "influenza" and the Influenza of human beings will be discussed later on.

PROGRESS OF THE EPIDEMIC.

Difficulties of
fixing date of
outbreak.

There are difficulties in ascertaining the exact chronological order in which different places were attacked with Influenza, or in assigning an exact date to the outbreak in any given place, as although the epidemic is often said to burst suddenly, yet on closer inquiry it is usually found to have been preceded by a succession of scattered cases, which may have attracted little notice at the time, until attention was recalled to them by the subsequent occurrence of the epidemic. Or, on the other hand, the subsequent occurrence of the epidemic may lead to cases of ordinary febrile catarrh, such as occur year by year, being reckoned as preliminary cases of the epidemic disease, the occurrence of which is thus antedated.

The difficulties in fixing the diagnosis of the early cases have arisen partly from the circumstance that owing to the length of time since Influenza has prevailed in an epidemic form, it was on its return an unfamiliar disease to the majority of the present generation of medical practitioners; partly from the disease not possessing any characteristic local objective symptoms by which it can be recognized, as small-pox, scarlet fever, or measles can be; and partly to the habit which has prevailed of calling severe cases of ordinary catarrh by the name of "influenza," so that catarrhal symptoms were expected to be met with as a characteristic feature of the epidemic Influenza, and practitioners were hardly ready to recognize as Influenza a disease in which these symptoms were often absent.

The occurrence of Influenza in foreign and remote places is not likely to be reported through newspapers until it has attained an extensive development, and therefore it is probable that the first cases of the disease may have taken place at dates earlier than those given.

In this portion of the report I have thought it desirable to record with special care the dates and circumstances of the first occurrence of Influenza in isolated localities such as islands.

British Isles.

BRITISH ISLANDS.

England and
Wales.

England and Wales (General Sketch).

Cases with the symptoms resembling Influenza are said to have been observed by some practitioners in London and elsewhere in November and even October 1889, but many of these were doubtless only ordinary febrile catarrh, as they were not followed by any extensive development of the disease. Influenza was prevalent to some extent in the western and north-western districts and suburbs of London in the fortnight before Christmas, but the epidemic began in the last few days of 1889, and the beginning of January 1890. Scattered cases (many of them imported from London or elsewhere), occurred in many places in the middle and end of December. The disease became epidemic in some places in the S.E. of England in the end of December, and generally in the southern, midland, and eastern counties in the first two weeks of January. In the western counties of England and Wales it occurred later in January, reaching the Scilly Isles about the middle of February.

Many districts in the N. and N.W. of England, in Cheshire, Lancashire, and Cumberland were not attacked by the epidemic till February,

and in others previously invaded a renewal of its activity was observed about this time. In some remote places in hilly districts (Moretonhampstead, Rishworth, Reeth, and Aysgarth), the disease was not observed till March.

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Of the large towns, Portsmouth was attacked in the middle of December; Hull in December (the disease being supposed to be imported from Riga); Birmingham, Liverpool, Dover, and Canterbury towards the end of December. In Manchester and Sheffield the epidemic did not occur till later, February, and in Derby the disease is said never to have attained epidemic proportions.

Taking excessive general mortality as an index of the presence of the Influenza epidemic, it would appear that the epidemic reached its height in the large provincial towns about a month later than in London. In January the death-rate per 1,000 inhabitants per annum was in London 28·1, while in the 27 largest provincial towns of the Registrar-General it was only 23·7. In February the death-rate in London had fallen to 21·2, being much below the average, while in these largest provincial towns it had risen to 27·4, a rate greatly above the average.

The general course of progress of the epidemic in England and Wales has been from S.E. to N.W. The large diffusion about the end of December is probably partly to be attributed to the large number of people who went down from London to spend the Christmas holidays in country places, and who, in a number of instances, are known to have carried the disease with them.

Certain isolated outbreaks of disease resembling Influenza also occurred during November, and the early part of December, in villages in the N.E. of England.

Scotland.

Influenza was imported into Leith (the Port of Edinburgh) on December 17th by a crew from Riga.* Scotland.

In the middle of December cases also occurred in Inverness, and the disease was epidemic there on December 31st, and was carried thence to Dingwall on January 8th.

On December 27th cases occurred among the troops at Aberdeen, and on December 31st at Edinburgh. It was prevalent in Edinburgh by January 4th. At Glasgow and Aberdeen a prevalence of catarrhs, popularly called "influenza," but no true epidemic, is reported in the "British Medical Journal," January 11th, 1890. Dr. Gairdner however thinks that an epidemic of genuine Influenza existed in Glasgow in January 1890, though mild compared with its characters elsewhere: Glasgow was in fact on the outskirts of the infected area. But although the month of January was, as regards temperature, unusually mild, the mortality from acute respiratory diseases was as great as in the severe winter of 1886-7, and greatly in excess of that in other mild winters. He suggests that the outbreak may have had something to do with the unusually still and stagnant condition of the atmosphere.† The attacks of Influenza differed from ordinary colds in that they came on more suddenly, subsided more rapidly, and were often quite unattended with catarrh. For a month previous to the epidemic a severe and widespread prevalence of "influenza" or "pink-eye" in horses had been observed, but it did not appear that the men who came most in contact with these horses suffered specially from Influenza.

* Dr. Brackenridge ("Lancet," March 15th, 1890) states that Influenza was present in Edinburgh in the last week of October 1889, and prevalent in the first week of November. A renewed outbreak occurred in the first week of March.

† But see pp. 79-80.

On the whole, Scotland seems to have escaped lightly, except the extreme north, Caithness and Sutherland, where Influenza was very severe, 30 deaths being ascribed to it in the town of Wick alone ("British Medical Journal," March 8th, 1890).

Dr. Saunders of Crail, Fife, informs me that the first typical case of Influenza at Crail occurred on January 12th, on which day three cases commenced. Other cases occurred during the course of the week in the families and among the neighbours of the first cases. For a fortnight previously there had been a prevalence of ordinary catarrh. On January 19th cases were general through the town and assuming a more severe type. Dr. Saunders observes that in Fifeshire the epidemic spread from the west (a west wind blowing at the time), Burntisland being first affected, then Kirkcaldy, Leven, Elie, St. Ninians, Anstruther, and Crail. Fifeshire, however, being a peninsula connected with the mainland only on the west, and Burntisland the point nearest Edinburgh, the course followed by the epidemic is also that which it might be expected to have taken if spread by human intercourse.

Some notes sent me by Dr. Caldwell Smith on the Influenza epidemic at Motherwell, Lanarkshire, will be found later on (p. 312).

Ireland.

Ireland.

Influenza was first observed in Dublin about December 21st.

Cases of Influenza occurred among the troops at Dublin on December 29th, and between January 4th and February 3rd at a number of other military stations in Ireland. It became prevalent in Dublin about January 11th (Dr. Burke).

At Belfast the first cases were observed about the first week in January, and the disease became epidemic from about January 10th (Dr. Woodhouse), reaching its height about January 24th ("Lancet"). On March 1st it had abated in Belfast, but was still prevalent in some parts of Ulster.

In Cork, the first case occurred in December 31st in a lady just returned from London, the next being another member of her household (Dr. Clements). It began to be prevalent between January 12th and 17th, and was still so on February 15th.

In Galway, the first case occurred on January 10th, the patient having come from an infected house in Dublin, as also had other of the earlier cases. Only about 30 cases had occurred up to January 29th (Dr. Browne).

An outbreak occurred at the Killarney Lunatic Asylum in September 1890.

The annual report of the Local Government Board for Ireland issued in 1890, states that the meteorological and economic conditions in Ireland during the last quarter of 1889 were favourable to public health: the mean temperature was above the average, and there was, especially in December, a remarkable absence of northerly and easterly winds.

Cases of "influenza" are said to have been recognised in October in a few districts in the east coast of Ireland, and isolated cases during November in several counties. During the month of December there can be no doubt that typical cases of Influenza were treated in more than one county in each of the four provinces.

It was, however, in the first week of January that Influenza prevailed generally throughout Ireland, its maximum being attained towards the close of the month and in the early part of February.

The number of cases severe enough to require relief by dispensary medical officers is given as follows:—

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Province.	Population 1881.	Cases of Influenza.	Per 1,000 Population.
Ulster - - - -	1,743,075	25,561	14·6
Munster - - - -	1,331,115	21,513	16·2
Leinster - - - -	1,278,989	21,356	16·6
Connaught - - - -	821,657	7,879	9·6
Total - - - -	5,174,836	76,309	14·8

The cases of Influenza attended by dispensary medical officers amounted to a little more than 16 per 1,000 of the estimated number of inhabitants in 1889, the population of Ireland having declined since 1881.

Of course the cases which came under treatment by the poor law medical officers would form but a fraction of the number which occurred; though the proportion of the population who apply for medical relief in sickness is greater in Ireland than England.

There was a general consensus of opinion among medical officers that the disease was miasmatic and airborne, and preceded and accompanied by high temperature and moist atmosphere. A few considered it infectious and contagious, but the great majority were of opinion that it was not. The disease did not appear to have shown a preference for particular localities, nor to have followed the usual channels of communication: its spread was not influenced by valley lines, by river courses, by high and low levels, by undrained or marshy ground, by drained lands or uplands, nor by the contour of the different areas attacked.

No class of persons was exempt from attack, but several observers thought that persons working in the open air suffered in larger numbers than persons who remained at home or worked under cover. A great many medical officers themselves suffered from the disease. The general expression of medical opinion was to the effect that there was no incubation period, but that the *materies morbi*, whatever its nature might be, was received into the human system in a condition which produced immediate results, and that the attack of Influenza was in the vast majority of instances sudden in its onset. The mortality directly attributable to Influenza was but small, but the death-rate from all causes rose from 16·5 per 1,000 per annum in the last quarter of 1889 to 24·5 in the first quarter of 1890; the latter being the highest death-rate recorded since the establishment of registration.

The nervous type of the disease was the most common, and the catarrhal the least so.

Diseases supposed to be Influenza among the lower animals, especially horses, dogs, and cattle, and cats, preceded or accompanied the Influenza epidemic in nearly all parts of Ireland.

Channel Islands.

Influenza is reported to have first occurred in the garrison at Guernsey Channel Islands, on January 10th; at Jersey on January 24th, and at Alderney on January 25th.

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The first case among the civil population at Alderney occurred according to Dr. Barnard, the only civil practitioner on that island, on January 14th. This island is in communication only with Guernsey and Cherbourg (by one steamer only, the same steamer going to both places), and the two persons first attacked, on January 14th and 15th, were both engaged in taking charge of the parcels brought by the steamer.

Influenza had been prevalent, according to Dr. Barnard, both in Guernsey and Cherbourg before it occurred in Alderney.

Isle of Man.

The garrison on the island were not attacked with Influenza. I have no other information.

ON THE CONTINENT OF EUROPE.*

Russia.

In Russian
Empire.

In the Russian Empire epidemic Influenza appears to have been first recognized in Central Asia at Bokhara in the second half of May (old style) 1889, and before the middle of July half the Europeans dwelling at New Bokhara had been attacked. At the beginning of October (old style, October 15th, according to our calendar), Influenza was present in Tomsk, over wide areas in Siberia, and in the province of Ufa, in Astrakhan, European Russia.

A writer in *Unsere Zeit*, who saw the Influenza epidemic break out at Bokhara, says, that the summer of 1888 was exceptionally hot and dry, and was followed by a bitterly cold winter, and a rainy spring. The dried-up earth was full of cracks and holes from drought and subsequent frost, so that the spring rains formed ponds in these holes, inundated the new railway cuttings and turned the country into a perfect marsh. When the hot weather set in, the water gave off poisonous exhalations, rendering malaria general. As the winter had been so severe the Bokhariots were obliged to spend money on firing, instead of food, so that they were weak from want of nourishment, while the severe fast of Ramadan further reduced their strength. Then the Influenza epidemic appeared suddenly, and the enfeebled inhabitants died in large numbers, while Europeans suffered so severely, that at one time all the household of the Russian legation in the city of Bokhara were ill in bed, and there was no one left to nurse the invalids. The Russian railway officials and soldiers were equally affected, and as soon as the sufferers became convalescent, they hurried home to Russia for change of air and good nursing. They seem to have taken the infection with them, for the epidemic travelled westwards along the central Asian railway, to break out at St. Petersburg, in October. Caravans travelling eastward, from Bokhara to Siberia, also conveyed the disease to post stations along the road.

[It seems, however, that "la grippe" figures largely in Russia in ordinary years. In 1886, 52,570 cases of "la grippe" were registered in the Russian Empire, with 512 deaths; the greatest number of cases occurred in governments in the west of Russia, and in that of Irkutsk in Siberia. In 1887, 43,983 cases, and 450 deaths are returned; the greatest number of cases again being in the west of Russia. (Kusnezow. "British Medical Journal." May 10th, 1890.)]

* The Board are indebted to the Colonial Office and to the Foreign Office for much valuable information respecting the Influenza epidemic as it occurred in the British Colonies and in foreign countries. By the former office a form of queries drawn up in the Medical Department of the Local Government Board was sent to the Governor of every British Colony, and at the time of this report going to press a reply had been received from every Colony with the exception of Canada.

The date of the first appearance of Influenza at St. Petersburg is variously given. Dr. F. G. Clemow, then resident there, states that isolated cases are said to have occurred in St. Petersburg and Cronstadt in the beginning of November, but that the disease did not attain epidemic proportions until the middle of the month, when its spread became exceedingly rapid. In a Government establishment out of a staff of 260 men, 220 were taken ill in a single night, that of the 15th November. He states that the earliest record of its appearance was at Tomsk, in Siberia, on October 27th (new style); on November 12th it had reached the Caucasus, and on November 13th it was at Viatka, 500 miles north-east of Moscow. By this time, according to an article in the "British Medical Journal" of January 4th, 1890, it was general in Russia, being epidemic at Riga, Pskov, Wilna, Kaluga, Moscow, and Sebastopol. In the same article it is stated that the first recognised cases at St. Petersburg occurred on October 15th, and that it was present at Tomsk at the same time. If this date be old style it would correspond with October 27th, new style, which is the date given by Dr. Clemow. (In an able article in the "Times" of April 12th, 1890, it is stated that the epidemic was at its height at St. Petersburg, in the middle of October, though a few cases had been observed there early in September.) The weather at the time when the epidemic appeared was warmer and moister than usual, with westerly winds.

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It was estimated that by the end of November half of the inhabitants of St. Petersburg had been attacked.

On December 10th the epidemic is reported as decreasing in some provinces in the interior of Russia, but breaking out in others, especially in the central and southern districts, and in the Baltic provinces.

On December 15th the epidemic is reported at Odessa, where, after a decrease, it recurred on January 1.

On December 25th it was reported as having been prevalent at Merv (where 35 per cent. of the troops were affected), at Askabad, and other Transcaspian localities. It was decreasing in southern Russia by the end of December.

On January 10th the disease is reported to have disappeared.

It is said that Influenza reappeared in an acute form at Warsaw in May 1890, and that horses were attacked with it.

Denmark.

The earliest cases in Copenhagen (according to information received through the Foreign Office) were noticed on December 7th. On December 17th it was stated that 3,500 cases had occurred in the previous week, and on December 24th the number had risen to 5,662, and on December 29th, to 6,000. It had begun to decrease by December 31st, but showed a recurrence on January 7th, declining again on January 12th.

Denmark.

Sweden and Norway.

At Stockholm the epidemic was present on December 9th, when many of the troops were suddenly attacked. The weather at the time was mild, damp, and foggy. On December 17th it was stated that 6,000 cases had occurred in the previous week. On December 22nd, 30,000 cases are said to have occurred. On January 14th it was declining.

Scandinavia.

At Christiania Influenza had appeared by December 28th, 300 cases having been reported up to that date. On January 12th it was spreading in Norway, and on January 19th it prevailed widely, and was extending to places in the interior of the country.

Iceland.

In London papers of July 11th, 1890, it was reported that Influenza had broken out in the south-west of Iceland, and that several fatal cases had occurred. Telegrams from Copenhagen dated July 23rd state that according to the latest news from Iceland the epidemic of Influenza had spread all over the island.

(Previous epidemics of Influenza in Iceland are said always to have occurred during the summer.)

Germany.

Germany.

The epidemic is said to have begun in Berlin at the end of November 1889, and by December 15th it was estimated by Professor Leyden that more than a third of the inhabitants were suffering from it. At Dantzie it began about December 10th. By December 18th the epidemic had practically spread throughout central and southern Germany; many of the large towns from Hamburg and Kiel in the north to Munich in the south being extensively affected. In Bremen so many of the *employés* at the gas works were incapacitated that it was feared that the town would be left in darkness.

At Königsberg the Influenza, previously of a sporadic type, became epidemic about December 27th.

At first the disease appeared of a mild character, but later it became more severe, being frequently complicated by gastric, nervous, and catarrhal complaints.

It is reported as beginning to abate in Berlin by the end of December, but increasing in many of the provincial cities. A recurrence was noticed in Berlin in the middle of February, and was attributed to the cold weather.

At Nuremberg two thirds of the population are said to have been attacked, and there the epidemic recurred in the early part of April after several weeks interval.

A number of local recurrences of Influenza in various parts of Germany are chronicled during the autumn months of 1890; but according to Prof. Leyden the complaint was confined to certain localities, and did not assume the character of a general epidemic like that of the preceding year.

Hesse.

An able report by Dr. K. Neidhart, chief medical officer of the Grand Duchy of Hesse, gives the date of the first observed cases, in all but two of the eighteen districts of the Grand Duchy, as some time in December; in the large towns, Darmstadt, Mainz, Giessen, and (perhaps) Worms, cases had occurred by December 10th; in the majority of the 18 districts the first cases occurred about the middle of December, but in some the commencement was deferred till the end of December or the beginning of January, and at Bingen (less than an hour's journey by rail from Mainz) until the middle of January. In country places the epidemic occurred as a rule later than in the towns; thus while at Darmstadt a whole family had been taken ill of Influenza on December 9th, in the neighbouring towns of Pfungstadt and Arheilgen, it did not occur until the middle of the month, and at Eberstadt, only a league from Darmstadt, not until the end of the month. An interval of longer or shorter duration seems always to have occurred between the first observed cases of the disease and the commencement of the wide extension of the disease. "According to the reports of the medical men the invasion of the disease has not been as a general epidemic, in the sense that on the very first day of its commencement a great number of the inhabitants of an affected place suddenly fell ill."

"The representation which the report for the district of Giessen gives of the mode of spreading of the disease is characteristic, and

“ appears applicable to most, if not to all the districts. The first cases
 “ of Influenza in Giessen were recognised about December 10th, 1889.
 “ Next thoroughly sporadic cases were met with, of many of which the
 “ diagnosis was only established retrospectively. From about December
 “ 17th it was generally recognised that the Influenza had effected its
 “ entry into Giessen; but the Christmas festivities passed over tolerably
 “ undisturbed. Towards the end of the year the number of sick
 “ already began considerably to mount up. The actual epidemic, how-
 “ ever, broke out with quite explosive violence in the first days of the
 “ New Year, and proceeded thenceforward to an extension, such as
 “ scarcely anyone had hitherto anticipated. Already by January 6th
 “ it had reached its highest point, which it maintained equally in the
 “ two first weeks of the year. From about January 13th a slow retro-
 “ gression could be reported, but the end of the epidemic followed
 “ almost as abruptly as its outbreak, and can be fixed at about January
 “ 20th. It was like a thaw. But until late in February new cases of
 “ sickness continued to occur, concerning which it must be left to
 “ individual judgment, which were to be counted as Influenza and which
 “ not.”

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[The above description and dates will almost exactly apply to the Influenza epidemic in London.]

The highest point of the epidemic seems to have been reached in the first week, or between then and the middle of January, except at Bingen, where the first cases did not occur till the middle of January, and the epidemic did not reach its height till the beginning of February. The proportion of the inhabitants affected was variously estimated in different districts, in some from 25 to 30 per cent., in others from 50 to 75 per cent. In the schools of one district 68·5 per cent. of the scholars suffered. All classes, ages, and sexes were attacked, but persons of the middle periods of life appeared to suffer in larger proportion than the very young; males at all ages more than females; and persons employed in the open air more than those indoors. There was doubt, however, whether the apparent greater incidence on certain classes might not be due to cases in those classes being more likely to come under medical observation.

The opinion universally held prior to the epidemic of the purely miasmatic origin of Influenza was greatly shaken during its course by the numerous instances which were observed of the disease having been introduced by persons who had contracted it in other places, and having spread from those first attacked to others who came in contact with them. The greater amount of social intercourse at Christmas, and the numerous holiday-makers from the towns who went to visit their friends in other places, were considered to have tended to the extension of the Influenza epidemic.

The number of deaths directly attributed to Influenza in the Grand Duchy was 514, or 5·2 per 10,000 population, but the total number of deaths in January, 1890 was 1,522 in excess of that in 1889 (3,354, against 1,832).

The Royal Medical College of Stuttgart, in a report* on the Influenza epidemic in the State of Wurtemberg, state that the disease was making insidious advances among the population in the first three weeks of December. It was at first mainly confined to the towns, and if it appeared in villages it did so as an importation from the more populous centres. With the close of the third week in December a sudden change

* "Lancet," November 8, 1890.

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came over its tactics till in the first week in January not a single public office or dwelling-place was spared. The towns suffered earlier than the provincial districts. By the last week in January the cases of illness which previously occurred *en masse* suddenly ceased to do so, and only isolated cases were recorded. The authors are of opinion that the exciting cause of the malady multiplied within the human body and wandered from place to place in sympathy with the coming and going of people. It was not, however, merely transferred from man to man, but after being deposited in a locality by patients it could maintain itself independently of these, and under specially favourable conditions, such as the great drought which prevailed during the period mentioned, could proceed to infect others. Persons who kept exclusively or a great deal to their apartments were scarcely touched by the Influenza, while those who led an outdoor life, or moved freely in and out, were seldom spared.

Heligoland.

In Heligoland (then a British possession, but since transferred to Germany), Dr. Lindemaur, Colonial physician, reports that two children of 5 to 6 years old had in the beginning of November 1889 what were afterwards said to have been attacks of Influenza, but that no further cases occurred until the beginning of December, when the first undoubted cases occurred in the first (highest) class at the school, among children 10 to 14 years old, and by the end of December the whole of the first class had been affected; the second and third classes following in January, and the fourth in February. Adults suffered in January and February. About half of the inhabitants are estimated to have suffered. Dr. Lindemaur considers that if the two cases in November were really Influenza, the disease must have come over by the air, and not been brought by a patient, for at that time the disease had only just begun in Hamburg, the only place with which the Island is in communication, viz., by a mail twice weekly; and there were then very few people coming to Heligoland. (It seems doubtful, however, whether the two cases in November were Influenza, and on the supposition of a wind-borne miasm being present in the general atmosphere, one would have expected more than two persons to have been affected. Moreover it is stated by Dr. Lindemaur that the winds during November and December were almost entirely from the west.) The disease afterwards appeared to spread by infection.

Switzerland.

Switzerland.

On December 26th numerous cases of Influenza had occurred among the visitors at Davos and St. Moritz, in the Engadine, and on December 31st it was said that every other person at St. Moritz was suffering. It was considered that the disease was highly infectious, and that it could hardly have come by the atmosphere, the place being surrounded by snow-mountains.

On January 5th the epidemic was reported as general throughout Switzerland.

Austria-Hungary.

Austria-
Hungary.

The first case of Influenza observed in Vienna was on November 30th. On December 10th its presence in an epidemic form was asserted, though denied next day by the Chief Medical Officer of the Vienna Board of Health. At the same date it had also appeared in Lemberg, Cracow, Bruenn, and several smaller Galician towns. On December 13th 25 per cent. of the pupils in several public schools had been attacked.

On December 25th it was estimated that 10 per cent. of the inhabitants were suffering. Women appear to have escaped comparatively at first, but to have been attacked in the end of December, and the number of fatal cases increased at that time.

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On December 20th the epidemic is stated to have been widespread in Pesth and other provincial towns in Austria and Hungary. According to another account the first cases of Influenza in Buda-Pesth were noticed about the middle of December, and the disease was epidemic there by the end of the month. It was estimated that by the middle of January, 50 per cent. of the inhabitants of Buda-Pesth had been attacked.* On December 29th upwards of 100 cases were reported at Prague, and the epidemic was severe there on December 31st.

On January 4th the epidemic is reported as declining in Vienna, but still spreading in the provincial towns, especially Prague, Buda-Pesth, Trieste, and the towns of southern Hungary; January 12th, at Zara in Dalmatia; and January 13th, spreading in Upper Styria. H.M.S. "Hecla" was attacked between January 4th and February 13th at Fiume, the disease being then prevalent on shore.

The proportion of the inhabitants attacked in Vienna is variously estimated as from 30 to 40 per cent.

S.E. Europe.

On December 15th the Influenza epidemic was reported to have reached Belgrade, and on December 24th one third of the entire population of that city were estimated to be suffering, or to have recently suffered from it. Servia.

On January 5th it is reported as almost dying out at Belgrade, but further extending in the Servian provinces.

On December 24th Influenza is reported to have broken out in an epidemic form at the military school at Sofia; there having been sporadic cases for a few days previously. On December 27th it is reported in a mild form at Rustchuk and Tirnova. It occurred at the end of December on H.M.S. "Cockatrice," stationed at Kustenjeh. Bulgaria.

On December 25th cases of Influenza are reported at Bucharest, Galatz, and Braila. Roumania.

On January 25th Influenza is reported, through the Foreign Office, as having been prevalent in Montenegro for some weeks past. 300 cases were said to have occurred in Cetinje in the week then last ended. The epidemic travelled down the Dalmatian coast, and first appeared in Montenegro at Njegosch, a place near the Austrian frontier. Montenegro.

In Constantinople the Influenza had made its appearance before December 29th. The disease was considered by the local medical men to have nothing in common with the dengue which had been prevalent there in the autumn. Turkey.

At Athens also the epidemic is reported to have made its appearance in the last few days of December. Greece.

(The earlier dates at Athens and Constantinople given by Dr. Clemow in the "British Medical Journal" of December 7th, 1889, were subsequently stated by him to have been a mistake. A report received by the Foreign Office, dated January 17th, denies the existence of true Influenza at Athens; admitting only the existence of an epidemic of coughs and colds, of mild type, and accounted for by the exceptional severity of the winter.)

* "Lancet," February 22, 1890.

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The Influenza epidemic was reported at Corfu, January 5th; and from the Navy return it appears to have been prevalent there on December 30th, when H.M.S. "Polyphemus" left.

Belgium.

Belgium.

Isolated cases of Influenza occurred in Brussels before December 13th; it had become epidemic by December 24th. In the beginning of December a number of post office employés at Brussels were attacked with catarrhal symptoms, declared not to be Influenza; half of them had recovered by December 13th. Influenza in a mild form was prevalent at Antwerp on December 17th. It had become epidemic there by December 24th, and it was estimated that one third of the population were affected.

Holland.

Holland.

Influenza, which for the previous few weeks had been sporadic in several parts of the country, became epidemic about December 17th, especially in the Army and Navy.

On December 22nd, Influenza was epidemic in Amsterdam, and had probably been so for some time, as on December 24th it was reported to be declining among the troops there, though it had appeared in Dordrecht and other Dutch cities. On January 3rd it was still spreading. On January 8th it was epidemic in Delft, Dordrecht, Leeuwarden, and Breda. On January 17th still increasing at Scheveningen. On January 9th, in many smaller places in the country, it was difficult to get medical assistance, as so many doctors were suffering from the epidemic.

France.

France.

Paris.

The earliest cases of Influenza in Paris are stated to have been observed about November 17th ("British Medical Journal," January 4th, 1890), but the disease began to be epidemic about November 26th, on which day a number of shopmen were attacked at the Magasins du Louvre, a large retail establishment. It is said also to have attacked a number of persons who were only in the shop for a very short time. It was denied that the disease could have been imported into this establishment by merchandize from Russia, as none had been received from that country for three years.

The disease is described as mild at first, but severe later on; the number of deaths being largely above the average from December 15th to the end of January. The weather is described as foggy and damp with snow and sleet. On December 27th it was estimated that one third of the population had been attacked with Influenza; and the postal, railway, and municipal services were seriously disorganised.

Provinces.

On December 16th the epidemic is reported at Roubaix, Arras, and Lille in Northern France, and on December 22nd at Montpellier, Bordeaux, and Monte Carlo; on December 23rd, at Dunkirk, December 25th, at Calais, December 29th, at St. Denis, Saumont, Nimes, and Toulon; on December 31st, as severe at Belfort and Havre. In Algiers on January 5th, and Tunis, January 8th. On January 10th declining in Paris and the Riviera; but spreading in Corsica and Algeria, and in the French provinces generally: severe at Brest, Montpellier, and Arles; January 18th, declining, except at Brest, Rouen, and in Rhone Inférieur. On January 31st it had disappeared from Paris.

Mortality in
Paris.

In a paper read before the Epidemiological Society of London, Dr. Jacques Bertillon stated that in Paris the excess of mortality between

December 15th, 1889, and the end of January 1890, beyond that in ordinary years amounted to at least 5,500 deaths. The number of deaths in the several weeks while the epidemic lasted was as follows:—

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Week.	1889.				1890.			
	49th.	50th.	51st.	52nd.	1st.	2nd.	3rd.	4th.
Deaths -	1,091	1,188	1,626	2,374	2,711	2,078	1,490	1,159

Of the deaths, however, only 213 were attributed by the certifying medical attendants to Influenza. This small proportion of deaths attributed directly to Influenza, compared with the total increase in the mortality, was observed, says Dr. Bertillon, also in London, Berlin, and other large cities, and arises from Influenza being very protean in form, and from its being dangerous only from its complications.

In a moiety of the cases Influenza causes death by reason of pulmonary complications (pneumonia, bronchitis, pleurisy, and pulmonary apoplexy). It greatly increases the severity of the following chronic diseases, and doubles the danger of sudden death from them, viz., pulmonary consumption, diabetes, alcoholism, softening of the brain, general paralysis, organic diseases of the heart, and senility.

Dr. Bertillon gave the following figures, showing the number of deaths ascribed to those several causes in Paris in the period December 15th to January 31st in 1889, as compared with the average number in the same period during the three previous years:—

Cause of Death.	Average 1887-9.	1889-90.	Ratio, 1889-90 to 100 Average.
Phthisis - - - -	888	1,720	194
Heart disease - - - -	290	518	178
Acute bronchitis - - - -	190	318	167
Chronic bronchitis - - - -	238	343	144
Pleurisy - - - -	183	363	199
Pneumonia - - - -	369	1,179	319

“During the epidemic period as compared with the average, the deaths in Paris from suicide were increased in the proportion of from 100 to 123; from general tuberculosis from 100 to 158; from diabetes from 100 to 196; from alcoholism from 100 to 186; and from paralysis from 100 to 250. On the other hand, the epidemic had no influence on ordinary epidemics (typhoid fever, variola, measles, scarlatina, whooping cough, and diphtheria), except as tending to the onset of pulmonary complications in those maladies.

“Influenza was not dangerous to children, but became so after the age of 20 years, and nearly doubled the mortality of every age beyond that period. It was only half as dangerous to life in women as in men.

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"It attacked equally all classes of society. Rich and poor, so unequally affected by other classes of illness, were attacked in like proportions by Influenza.

"Relatively to other nations, England was spared; but the disease attacked with greater severity the west than the east of Central Europe."

Introduction at
Brest.

The following account is given of an outbreak of Influenza on board the school ship "La Bretagne," which with two others lay in the harbour at Brest. An officer returned to the ship from Paris with some goods which he unpacked himself on shore at Brest. On December 11th, three days after unpacking the goods, he was attacked with Influenza on shore, on the following day, his wife, and the day after, three servants. On December 14th, before he was well, he went on board the "Bretagne." On December 16th a case developed on board the ship, and from that day it continued to spread until 244 out of 850 on board were taken ill. The disease also appeared in the families of those officers in the city of Brest who had been taken ill on board ship, and had returned to their homes in the city. At the same time not a single case appeared upon the other school ships in the same harbour.

Italy.

Italy.

Influenza was first reported at Spezia, where it broke out first on a training ship on December 15th, and was spreading among the residents on December 20th (Foreign Office). San Bartolomeo and Port Usola, separated from Spezia by a gulf two miles wide, were not attacked till a fortnight later. It was reported at Verona and Piacenza on December 17th. Its occurrence at Rome, reported on December 12th, was at first denied, but was admitted on December 29th; the disease was thought to have been imported from Paris. On December 29th the epidemic was at Genoa and at Gaeta (where from one-half to two-thirds of the inhabitants are said to have been affected). On December 31st it was at Turin, Milan, Bologna, and Messina, and January 1st at Modena. On January 3rd it was spreading in northern Italy. On January 4th it was reported at Florence, where it had appeared within a few days, and at Venice, and on January 5th at Naples, and on January 6th as general throughout Italy. It occurred on board H.M.S. "Collingwood" at Port Augusta, Sicily, before January 18th, the disease being then prevalent on shore. On January 24th it was reported at Palermo in Sicily, and in Sardinia on January 27th. On January 24th it was general among all classes at Rome, at first the upper class only having been attacked. On February 2nd it had greatly diminished in Rome. On February 15th it was declining in central and northern Italy, but still prevalent in the southern towns.

Spain.

Spain.

A few cases considered to be Influenza had occurred at Malaga on December 12th, and at Madrid on December 13th. On December 17th the existence of the epidemic was officially announced, and the cases were so numerous as to derange the service of the post office, banks, theatres, &c. On December 20th it was stated that 30,000 people had been attacked in the previous 10 days. The weather for a month had been very cold, dry, and frosty. By December 26th, Influenza was so general as seriously to interrupt business of all kinds. By December 29th most of the Spanish provinces were affected. On December 31st it was said that 56,000 cases had occurred at Barcelona. It declined in Madrid about the beginning of February.

Portugal.

On December 20th, Influenza had occurred and was rapidly increasing in Lisbon; it had also occurred in Oporto. On December 27th it was extensively prevalent in Lisbon, there being 2,000 cases in the hospitals, and the King and Queen had been attacked; it was also epidemic at Oporto. On January 13th it was still increasing at Lisbon, but on January 15th it had began to decline there, though still prevalent in the provinces.

A recrudescence of the disease occurred, according to the "Correio Medico" in March at Lisbon, and other places, and many horses also were attacked.

The epidemic was very severe in Portugal and hardly any part escaped. One writer estimates that nine-tenths of the population were attacked. There was a large increase of mortality due not so much directly to Influenza as to its complications and sequels. The deaths in Lisbon in December 1889 were 819, against 619 in December 1888.

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BRITISH MEDITERRANEAN POSSESSIONS.

Gibraltar.

Cases of a doubtful nature were said to have occurred during the last 10 days of December 1889. The Sanitary Commissioners' officer of health reports the first typical cases among the civil population on January 2nd. "The epidemic then began in earnest." He says that there is no evidence as to the method of introduction of the disease. The Surgeon-General in charge of the troops gives January 6th as the date of the first occurrence of Influenza, and of the commencement of the epidemic among the troops (it having appeared among the civil population a fortnight before), and February 21st as that of its decline, the last case being on February 23rd. He says that it was apparently imported from Spain, the first case being nearest the Spanish lines, and the last cases at the opposite end of the rock.

The Navy return states that Influenza was reported to have been brought to Gibraltar by an American man-of-war.

Newspapers report Influenza as present on January 11th, increasing about January 21st.

Malta.

The chief Government medical officer states that the first cases of Influenza at Malta occurred in the latter half of December, and that the epidemic ceased to prevail at the end of March, although lingering cases have since continued in country places. The reported cases in Malta were 759, and in Gozo, 247. 26 males and 38 females died in Malta, total 64, but no deaths occurred in Gozo. He considers the disease to be pandemic, and not transmissible by contagion. Influenza became epidemic among the troops at Malta early in January.

Cyprus.

The chief medical officer reports that the date of the first occurrence of epidemic Influenza varied in different places in the island, from the commencement of December at Limassol to the commencement of April at Kyrenia. Its chief epidemic prevalence was between the middle of December and the end of February. It was believed to be imported, as the disease showed itself almost simultaneously at Larnaca and Limassol, both seaports. Cases were observed in remote districts, but only after

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persons had visited the before-mentioned infected areas. Many animals suffered from the disease,—horses, mules, and more particularly cows. The epidemic attacked indiscriminately both rich and poor, but was generally speaking of a mild form.

Among the troops in Cyprus one case of Influenza occurred before the end of December; in January it was reported to the Army Medical Department that Influenza was on the increase, but the cases had not been serious; in February it was greatly on the decrease, all the cases being slight, and yielding readily to treatment; and in March it was reported to be disappearing from the island.

AMERICA.

Jamaica.

Jamaica.

Except Greenland and Athabasca, where Influenza is said to have been epidemic in May 1889, the earliest report of its presence in the New World comes from Jamaica. An extract from a letter from Dr. J. C. Phillips, of Kingston, dated December 17th, 1889, quoted in the "Lancet" of January 25th, 1890, runs thus:—

In Nov. 1889.

"I see that there is an epidemic of Influenza throughout Europe. Strange to say we have been suffering from it here for more than a month. It is characterised by an initial fever of from 12 hours to four or five days duration, catarrh, cough, and pain in the chest lasting for two or three weeks sometimes; the worst cases turning into laryngitis, bronchitis, and pneumonia. I understand that it is also prevalent in America. I characterised it on the 6th inst. at our branch meeting as an epidemic Influenza."

A report received from the Colonial Office, dated June 14th, 1890, states that the epidemic was experienced at the Military Station of Up Park Camp and at Kingston, about one mile from the camp. It was not general throughout the Island. It commenced at the camp in the middle of November 1889, after the arrival from England of the wife of an officer who suffered from the affection; the disease subsequently spread among the officers and their wives at Up Park Camp. The horses of officers at camp were attacked at the same time with symptoms of severe catarrh of eyes, nostrils, and respiratory passages.

The attacks in Europeans were generally slight and of short duration. In the case of natives, pulmonary complications were observed with some fatal results consequent upon pneumonia. It declined in January 1890.

The reports in the Army Medical Department, however, only give a single case of Influenza as occurring among the black troops in December 1889, and none among the white troops.

In Aug. 1890.

An outbreak of Influenza occurred in August 1890, among the white troops at Newcastle, a hill station. It was confined to this one station, and the black troops escaped.

United States.

United States.
New York, &c.

On December 17th, 1889, a physician in New York city reported to the Board of Health that seven cases of Influenza had come under his notice in a German family of 13 persons, the first case being that of a young woman who was taken ill on December 11th. She had received a letter from Berlin on December 10th. Other cases followed in the same family, as follows: 1 on December 12th, 1 on December 13th, 2 on December 14th, and 2 on December 15th. On December 27th there were said to be hundreds of cases in New York.

At Boston its general appearance among large numbers of people was quite as early if not a day or two earlier than at New York: multiple cases in several establishments in and near Boston having occurred on December 17th.

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On December 19th, Influenza had appeared at Buffalo, at Detroit (where bank employes were the first persons attacked), and at Kansas City (where 100 cases were reported).

On December 20th it is reported among post office employes at Rochester, N.Y.

By December 27th the epidemic had appeared at Philadelphia, Baltimore, and various other places in the United States.

An able report by Dr. Ranet, secretary of the Illinois State Board of Health, dated February 13th, 1890, states:—

“Influenza was first recognized in Boston on December 19th, in New York City, December 20th, and in Chicago about December 23rd, and probably first among the employes of the post office. It has extended from the Atlantic to the Pacific, and as far south as Mexico and Central America, practically spreading over Europe and a large portion of North America within 90 days, extending over a greater area and with a greater rapidity than any epidemic of which we have a record. The so-called Influenza seems to have made its appearance in the large cities first, and afterwards to have extended to their immediate neighbourhood. Although it is said to appear simultaneously in different localities, I am inclined to think that if the history of the disease is carefully studied some communication will be discovered as incident to its spread. In March 1843 the Influenza appeared in Germany and England; in April in France; in June in the New England States and New York; in July in Pennsylvania and a portion of the Southern States; and by August it had extended over almost every part of the United States. Thus in 1843 it consumed six months in spreading to and through this country (the area of which was limited at that time), while the present epidemic has extended from St. Petersburg to the Pacific Coast and Central America within three months. Is this due to the increased facilities for communication and travel?”

Illinois.

The month of December 1889 was a most remarkable one in the United States, being milder and moister than any previous one on record; at Chicago the mean daily temperature was $11^{\circ}\cdot7$ higher than the mean for the month for the past nine years; at Springfield 13° higher; and at Cairo (Illinois) $16^{\circ}\cdot8$ higher ($54^{\circ}\cdot3$ against $37^{\circ}\cdot5$). In January 1890 also the temperature and the rainfall were above the average.

In January the mortality in New York, Boston, and other cities was exceptionally heavy.

The mortality from all causes and from respiratory diseases reached its maximum in Boston, New York City, and Brooklyn in the week ending January 11th; in Cleveland, Providence, and Minneapolis in the week ending January 18th; in Charleston and Washington in the week ending January 25th; and in St. Louis, Milwaukee, and San Francisco in the week ending February 1st, 1890.

In St. Louis and New Orleans Influenza appeared about January 1st, and in the former city began to cause an increase in the death-rate about January 18th. In the southerly cities of the United States the fatality was not so great, and the epidemic did not manifest its influence so early as in the northern cities, low temperature appearing to increase the mortality incident to the epidemic, if not its spread.

Dr. M. A. Veeder, of Lyons, New York, U.S.A. ("British Medical Journal," May 31st, 1890), remarking on the parallel course of the Influenza epidemic there and at Melton Mowbray (see page 274), states that the first unmistakable case at Lyons, New York, of which he had knowledge, was seen on December 21st, and had been ill two or three days. Other cases followed immediately and were associated with the first one, all the clerks in the establishment being affected within a few days. There were at the same time a few isolated cases in the country around. The disorder spread in a very irregular way, becoming most widely prevalent about the middle of January, though cases continued to be numerous in February. Its extension in the country districts was much slower than in the village, cases among farming people continuing to come under observation after it had almost ceased in the village.

Massachusetts.

In the 21st annual report of the State Board of Health for Massachusetts, Dr. Samuel Abbott, secretary to the Board, from a consideration of 396 replies received in answer to circulars sent to physicians, employers of labour, and heads of public institutions, arrives at the following conclusions:—

1. The first appearance of the Influenza in Massachusetts as an epidemic, in the past season, may be stated to have been on the 19th or 20th of December 1889, and the place of its first appearance was Boston and its immediate neighbourhood.
2. It increased rapidly in the number of persons attacked, and reached its crisis generally throughout the State in the week ending January 11th, 1890, after which date it generally declined in severity, and had nearly ceased as an epidemic by the 10th of February; so that the duration of the epidemic was about seven weeks. It reached its crisis earlier by several days in Boston than in the smaller cities and the remoter parts of the State. Its course was still later in Nantucket, Dukes, and Barnstable counties. [The two former of these counties are islands, and the latter a peninsula.]
3. The ratio of the population attacked was about 40 per cent,—or more exactly, as indicated by the returns, 39 per cent.—or about 850,000 persons of all ages.
4. People of all ages were attacked, but the ratio of adults was greatest; of old people next, and of children and infants least.
5. The weight of testimony appears to favour the statement that persons of the male sex were attacked in greater number, and with greater severity than females.
6. The average duration of the attack (acute stage) was from three to five days.
7. The predominant symptoms were mainly of three general groups,—nervous, catarrhal, and enteric, the last being much less common than the others; the special symptoms most observed in the nervous group being extreme depression, pain, and weakness; in the catarrhal group, cough, dyspnoea, and coryza; and in the enteric group, nausea, vomiting, and diarrhoea.
8. The chief diseases which followed in the train of Influenza, and were intimately associated with it, were bronchitis and pneumonia. Phthisis, when already existing in the victim of the attack, was undoubtedly aggravated; and, in many cases, a fatal termination was hastened.
9. The ratio of persons attacked in industrial and other establishments employing large numbers was about 35·5 per cent., or less than

that of the population at large. That of the inmates of public institutions was still less,—29 per cent.

10. The ratio of persons who were obliged to leave their work on account of illness from Influenza was about 27 per cent. of the whole number employed.
11. The average length of their absence from work was five days.
12. Special occupations do not appear to have had a marked effect in modifying the severity of the epidemic upon operatives in such occupations.

Dr. Abbott concludes, "We can see no reason for maintaining exclusive theories in regard to the spread of Influenza. If it is spread exclusively by the atmosphere, why should it not follow the direction of the wind? Notwithstanding its rapid spread and its appearance in rapid succession in contiguous countries, it has not travelled faster than modern modes of locomotion would explain. From the observation of the present epidemic in its earlier appearance and more rapid spread in densely settled than in sparsely settled populations, and the numerous instances of its appearance soon after the arrival of people from infected places, the writer cannot avoid the conclusion that while the atmosphere may constitute one important medium of its communication, human intercourse also suggests itself as an equally important factor."

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British North America.

Canada.—On January 3rd Influenza was reported at Quebec and Montreal, and by January 8th it was general in Canada from Quebec to the Rocky Mountains. It was prevalent at Esquimaux before January 5th (Navy returns on pp. 162 and 166). Canada.

Nova Scotia.—At Halifax 16 cases occurred among the troops in January; the disease being then very prevalent among the civil population. Nova Scotia.

Newfoundland.—Dr. Rendell reports to the Colonial Office that early in February 1890 Russian Influenza appeared at St. John's, having come along the line of travel from the United States. The epidemic was characterised by the usual symptoms (rigor, fever, pain in the joints, and protracted convalescence). It remained in St. John's about six weeks, and then rapidly disappeared, passing to neighbouring towns. The epidemic did not exhibit the same severity as in other parts of the world, and caused few or no deaths. Cases rarely developed complications. Newfoundland.

Mexico and Central America.

On January 17th Influenza was reported to be present in Mexico, and on January 23rd to be spreading rapidly there. On February 8th it was reported diminishing in the capital, but increasing in the north and west of the Republic. It commenced on board H.M.S. "Daphne" at Acapulco, in the last week of February. So far as known the disease did not then exist at that place, but was prevalent in Mexico. Mexico.

About January 31st, Influenza occurred at Guatemala, Central America, about 300 miles from the Atlantic coast, the artillery barracks being first attacked. Central America.

British Honduras seems to have escaped the Influenza epidemic, at Belize only a single case of "influenza" in March is reported, and a prevalence of catarrh, so mild, that, but for the occurrence of Influenza in other parts of the world, it would have passed without notice.

South America.

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River Plate.

On February 2nd Influenza was reported to be epidemic at Buenos Ayres and Monte Video,* ports in frequent communication with Europe, and thence it seems to have worked its way up the coast to Brazil, where it had occurred at Pernambuco in April. (J. Toppin, "Lancet," June 7th, 1890.)

Chili.

Influenza was prevalent in Chili in January, February, March, and April, 70 per cent. of the population being estimated to have suffered. It was of a slight character at first, but cases became much more severe towards the end of the epidemic.

Peru.

Influenza was prevalent at Callao (Peru) in April, 1890 (Navy return II.). It was declining on May 12th at Arequipa (J. O. Hunter, in "Lancet," June 20th, 1890).

Ecuador.

Information received through the Foreign Office, date April 15th, 1890, states that the Influenza epidemic was then present in Ecuador. There had been many cases, but few deaths in Guayaquil. There were said to have been 10,000 cases in Cucuca, but few only hitherto in Quito. Later, it was stated that the epidemic had broken out in Quito at the end of April, and raged throughout May: 46,000 cases are reported to have occurred there, some of which terminated fatally. The epidemic first invaded the southern and central provinces of Ecuador, and then travelled north. It had completely disappeared by July 2nd, 1890.

West Indies (other than Jamaica).

Trinidad.

It was reported on June 18th, 1890, that no Influenza of an epidemic character had shown itself as yet in Trinidad, although "influenza" is common there in the months of January and February, when northerly winds prevail.

Tobago.

At Tobago, it is reported by Dr. Tulloch, Colonial surgeon, that "influenza," without marked nervous depression, occurred at the end of January, and was prevalent from the middle of February to the end of March. The prevalent winds at the time of the beginning of the epidemic (which was by no means severe) were northerly, and the night temperatures low. The disease appeared to be merely an exaggeration of the ordinary "colds" always prevalent at that season. It was followed by some cases of pneumonia, and by one of acute nephritis. Only one death was heard of. The epidemic appeared to begin in Scarborough, the port of entry, and to be more prevalent there than in any other part of the Island.

At Antigua an epidemic of a mild type, with a few serious cases, is reported as beginning in January 1890, and still going on in June.

S. Kitts.

At St. Kitts and Nevis, Influenza with well-marked symptoms first occurred on February 9th, 1890, and was definitely epidemic from the second week in February to the middle of April. There was no evidence of its mode of causation, except that the north-east winds were more boisterous and persistent than usual, and seemed to favour its spread and continuance. It was more prevalent on the windward than on the leeward side of St. Kitts, and especially so in the valley of Basseterre, and more in St. Kitts than in Nevis.

The Bahamas, Grenada, and St. Lucia, are reported to have escaped.

At St. Vincent, the Colonial surgeon reports that the first case of Influenza came under his notice on January 22nd, 1890, that the disease became epidemic early in February, and declined after the middle of March. There was no evidence as to the mode of its origin or introduction, but it appeared to spread by infection. Horses and dogs suffered from catarrhal affections of the throat and chest. The epidemic

* It seems from the Navy return, page 163, to have been at Monte Video in the latter part of January.

travelled from east to west, (the latter being the windward part of the Island). No cases occurred in the leeward district. Its incidence was sudden.

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At Barbados the date of the first occurrence of Influenza is given by a committee of medical men as April 15th, 1890; and the disease became epidemic early in May, and lasted until the end of June. There was no evidence as to its mode of origin or introduction: it made its appearance about the same time in all parts of the island, and, it was thought, could only have been carried by atmospheric agency, though there were evidences of its having also spread from individual to individual.

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Barbados.

At the Glendairy Male Prison the first case of Influenza occurred on May 19th, the epidemic having prevailed outside the prison for about 3½ weeks previously. The epidemic in the prison lasted 32 days (the last case occurring June 17th), during which time there were 41 cases of the disease in a daily average of 200 men, the admissions during that time being 102, and the discharges 100. No prisoner was admitted with Influenza. The first three cases occurred on May 17th in convicts who had been in prison respectively 5 months, 4 months, and 1¼ month: they were all three working in one of the corridors where prisoners when first brought in are stripped and examined, and they might have come into contact with the clothing which such men were wearing before admission. Two of the patients were in hospital for other diseases when attacked. Of 29 warders, 6 had the disease. The average stay in hospital was 6·9 days per case. There were no deaths.

At the Female Prison 22 cases occurred in a daily average of 90 women. The first case occurred on May 4th in a woman who had been in prison 11 days, and had not been exposed to any source of infection after admission. The next case occurred May 20th in a convict under treatment in hospital. Excluding this case, the average stay in hospital was 11·4 days. The last case began July 7th. Of eight subordinate officers, two took the disease. There were no deaths.

Influenza was prevalent among the troops, both white and black, at Barbados, in May, June, and July.

Bermuda.

Bermuda.

This Colony is stated by the Colonial medical officer to have escaped epidemic Influenza, with the exception of Ireland Island, as to which the following interesting history is given in reports received through the Colonial Office.

Ireland Island.

On March 5th, 1890, the Swedish corvette "Saga" with a crew of 12 officers and 196 men, arrived at St. George's, Bermuda, having on board upwards of 70 men ill of an epidemic, which was diagnosed as "dengue," but seems to have been afterwards recognized as Influenza. The "Saga" had left Sweden on September 28th, 1889, and had been cruising during the winter in the West Indies. The health of all on board had been excellent up till the end of February. On February 20th the "Saga" called at Havana (Cuba), and remained there until February 27th, when she left for Bermuda. The day after leaving Havana sickness began to appear, and daily increased until every officer, petty officer, and man liable to the disorder suffered from it, and a state resembling panic prevailed on board. The "Saga" was placed in quarantine where she remained until March 12th, when she proceeded in quarantine to Grassy Bay, Hamilton. On March 18th, having had no fresh case of sickness since March 12th, and having on the sick list only three men, one suffering from pneumonia, one from chronic diarrhœa, and one convalescing from Influenza, she was granted pratique

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and proceeded to H.M.'s dockyard at Ireland Island: she came into the Camber on March 20th, and remained there until April 3rd, when she sailed for England.

The first case of Influenza in Ireland Island occurred on March 27th on board H.M.S. "Bellerophon." This ship came into the Camber on March 22nd, and made fast just ahead of the "Saga." Influenza assumed an epidemic form on board the "Bellerophon" on March 31st, and finally ceased on April 30th, the total number of cases entered on the sick list having been 160.

Influenza in an epidemic form occurred on board H.M.S. "Comus" on April 10th, and lasted till May 3rd, the total number of cases being 87.

The disease appeared as an epidemic on board H.M.S. "Canada" on April 26th, and lasted till May 20th, the number of cases being 56.

These ships were at a greater distance from the moorings of the "Saga" than the "Bellerophon," and the Canada did not enter the Camber till April 12th, after the "Saga" had left.

Only 29 cases occurred among the crews of the stationary ships, and the families of the officers and men residing on Ireland Island. On May 22nd it had disappeared from the ships, but there were still a few cases among the residents on the Island. It did not assume an epidemic form among the residents on the Island until it had ceased as an epidemic on board ship. No case originated at the Royal Naval Hospital where all the worst cases were sent for treatment.

The returns received from the Army Medical Department state that 11 cases of Influenza occurred among the troops at Bermuda in January, at which time there was a good deal of mild Influenza among the civil population (this is contrary to the statement of the colonial authorities). Other cases occurred in February and March, up to April.

Falkland
Islands.

Whooping-cough
not Influenza.

Falkland Islands.

The Governor reports on November 8th, 1890, that an epidemic of a very serious nature, said to be a form of Influenza complicated with bronchitis and pneumonia had prevailed during the last two months to an alarming extent. The fatal cases had been chiefly among very young children, 16 of whom had died between September 21st and the date of writing. There had also been much illness among the adult population, but no fatal cases had occurred.

A subsequent report, however, by Dr. Hamilton, Colonial surgeon, states that the epidemic in question was a severe form of whooping-cough, and was in nearly all cases unaccompanied by the symptoms ascribed to the Influenza in Europe, viz., nervous depression, headache, and muscular pains. The spasm and whoop were exceedingly severe and the malady ran its usual course of several weeks. Adults were also affected with a hard paroxysmal cough. A few sporadic cases occurred early in September, and the disease gradually developed into an epidemic of severe type, visiting every house in the settlement. It was introduced into Stanley from Punta Arenas, South America, into which latter place it was imported by a French emigrant ship from Europe.

AFRICA.

Egypt.

Egypt.

The first case of Influenza at Alexandria was observed about December 25th, 1889, and at Cairo on January 10th, 1890. ("Lancet," March 1st, 1890.)

It became epidemic at both places, being at its height between January 17th and February 6th. It was dying out by the middle of March.

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Among the British troops in Egypt Influenza prevailed in February, disappearing in March. The cases were mild: bronchial complications occurred in almost every case, but convalescence was rapid.

Canary Islands.

Feverish colds "apparently representative of the Influenza in a modified form," are reported at Orotava. ("British Medical Journal," May 31st, 1890.)

Canaries.

Cape Verde Islands.

An outbreak of Influenza occurred on H.M.S. "Australia" while at St. Vincent between January 7th and 25th.

Cape Verde
Islands.

Azores.

The "British Medical Journal," August 13th, 1890, states, on the authority of the *Correio Medico*, that Influenza had been rife at the Azores for some months, and seemed to be assuming a more serious type. On the island of Pico it was raging with great severity, and was accompanied by a form of ophthalmia, characterized by hæmorrhage into the soft tissues surrounding the globe of the eye.

Azores.

St. Helena.

Endemic "influenza" of an ordinary type is said to be prevalent almost every year, especially towards the commencement and close of the hot weather when variations of temperature are great; the cases are frequently benefitted by quinine. Epidemics of "influenza" are said to have prevailed among the troops in the years 1865, 1867, 1875, and 1876, but in the opinion of Surgeon-Major Gunning apparently they were nothing more than severe types of the usual annual attacks.

St. Helena.

St. Helena had up to August 1st, 1890, quite escaped the pandemic Influenza of 1889-90, but it appears to have been reached later in the month; three cases being recorded among the troops there in August.

West Coast.

Sierra Leone.--Dr. Palmer Ross, Colonial surgeon, reports that epidemic Influenza of a severe type, with symptoms similar to those met with in the epidemic in England, prevailed extensively at Freetown and along that part of the coast. It was said also that the native tribes in the interior outside the limits of the colony had suffered very much, and many had died from "Fever and cough." Dr. Ross says that the first cases in Freetown showed themselves about March 3rd, 1890, the epidemic prevailing from about that date to the middle of April declining after the first tornado. He ascribes it to atmospheric causes, high temperature, with great diurnal variations, and malaria, though he notes that a few days before it broke out, the s.s. "Africa" and H.M.S. "Archer" had arrived at Freetown from Gambia with a few cases on board. Surgeon-Major Kilroy, senior medical officer, states that Influenza was very prevalent in Freetown in February and March, having been introduced from the Gambia by H.M.S. "Archer" in February; but owing to the fact that the troops were under canvas on the top of Korbright Hill, the epidemic did not spread among them until the beginning of April. On the other hand, Dr. Wykham, in

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practice at Freetown, states that the disease was first recognised there about the early part of January: towards the end of January it had multiplied itself markedly, but about the middle of February it began to manifest itself as an epidemic: March and April saw it at its height, and it began to decline after the first showers of the rainy season in the last week of April. It affected the native races more severely, and apparently earlier than the Europeans.

Among the British troops at Sierra Leone, 10 cases of Influenza are recorded in April and May.

Gambia.

Gambia.—The Colonial surgeon at Bathurst reports an unusual increase in the number of cases of catarrh, "influenza," and lung diseases during February, March, and April 1890, but no epidemic. The Administrator, however, states that Influenza of a severe type has occurred among the natives in Barra, Combo, and along both banks of the river; and that traders report that whole towns have been prostrated, so that there was for a time great difficulty in getting the usual labour to carry down merchandise. He says that H.M.S. "Archer," prior to her departure from Bathurst on February 18th, had a few cases on board, and after her arrival at Sierra Leone nearly the whole ship's company succumbed to the malady; but he is not prepared to say that the infection came from Bathurst, as it is possible that it might have been brought to Bathurst from Sierra Leone, whence the "Archer" came in the first instance. There had been an unusual prevalence of cold weather since December 1889.

Lagos.

Lagos.—On June 7th, 1890, the chief medical officer reports that "the Influenza epidemic has not appeared in the colony of Lagos." Two cases are reported in June on H.M.S. "Alecto" then at Lagos.

Gold Coast.

Gold Coast.—The chief medical officer reports that the Influenza only appears to have shown itself in the districts of Axim, Saltpond, and Kwitta: those of Elmina, Cape Coast, Prampram, and Ada having apparently escaped. No Influenza occurred among the British troops at Cape Coast Castle.

At Axim it was first observed in the beginning of May, and lasted through May on towards the middle of June. Its mode of origin was not known, but one of the first cases was a customs officer, and it was observed to spread by contagion in a striking manner among the other officials in contact with him. Many cases occurred among natives in the town.

At Saltpond, Influenza was first observed in April, and was epidemic in May 1890; its mode of introduction was unknown, but its spreading was considered due to infection. Only natives suffered, the white community being exempt.

At Kwitta the first case in a European came under notice during the first week in April; the epidemic began with the beginning of the rainy season in April, and declined towards the end of May. Its origin was unknown. It broke out in several parts of the district at the same time, and attacked large numbers of people in rapid succession. Its progress appeared to be against the wind, for it was observed at the German Protectorate, a few miles to the leeward, four days earlier than at Kwitta. It prevailed especially in low and damp localities, and hence towns and villages on the seaboard suffered excessively, while those in the interior seem to have escaped. Cases among Europeans were mild; but among the natives it appeared in a virulent form, and spread like wildfire.

Senegal.

Senegal.—Influenza was reported to be raging at St. Louis in the middle of July: nearly the whole of the population had been attacked,

and the public departments were disorganised in consequence of the illness of so many officials.

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Cape Colony.

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Influenza broke out at Cape Town in the first week in January 1890. It is believed to have been introduced by steamers from Europe, on most of which nearly all the crew had suffered from it on the voyage. (Dr. Scholtz, in "British Medical Journal," March 15th, 1890.)

Cape Colony.

On March 1st it is reported as increasing in Cape Colony. In April, Influenza was very prevalent among the crews of British vessels at Simon's Town. H.M.S. "Curaçoa," having had at one time nearly half her crew under treatment, while the flagship had over 100 hands down with it. The weather was cold and damp.

Among the troops a few cases occurred from February to June.

Basutoland.

Dr. Radford Savage, medical officer at Maseru, reports that epidemic Influenza appeared in the colony about the end of March, spreading gradually northwards. It was characterised by severe frontal headache, pains throughout the body, and general catarrh, sometimes by fever, loss of appetite, and great nervous depression; but was of mild character throughout, and no deaths occurred. At Mochales Hock it first appeared in the latter half of March, and almost simultaneously at Quthing, 30 miles distant. The majority of the European inhabitants at these places were affected, and a large number of natives, but no very serious case occurred. The epidemic lasted about six weeks. At Maseru the disease appeared about the beginning of April, and disappeared gradually towards the end of the month. The majority of the cases followed on a week of very cold weather (6th-13th April). The cases were few and mild, and seldom more than one person in a family was affected.

Basutoland.

Influenza was extremely prevalent among the white inhabitants of Ladybrand and the Free State, bordering Basutoland, towards the end of April and during the month of May.

Natal.

In reply to a circular sent by the Governor, replies were received from 34 medical men practising in this colony; but it is difficult to gather from them a distinct notion of the general behaviour of the Influenza there. Eleven practitioners deny that there has been any epidemic, and nine report only a few cases, or cases like those met with every year in the winter season. Dr. Campbell, of Durban, says that that there was a widespread epidemic of Influenza in the town and district of Durban (the port of the colony), characterised by high fever, frontal headache, muscular pains, severe depression, and prolonged convalescence; but with no fatal cases. According to him, the first cases began to appear towards the end of October 1889; the epidemic was general by the end of November, and continued through December; it diminished in January, and increased again in February, diminished in March, and had almost ceased at the end of April. He believes the disease to have been imported by passengers coming from those parts of Europe where it was epidemic, or by letters from Europe, having seen three instances of Influenza breaking out in households after the receipt of letters from those who had had it in Europe, but it is difficult to reconcile these statements with the early date given for the epidemic at Durban. Of the other practitioners in Durban, one says that a few

Natal.

Date doubtful.

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cases (about twenty or thirty during a month) occurred at the time that Influenza was prevalent at the Cape, and after it had commenced in England; another, the house surgeon at the Durban Hospital, says that since his appointment in January 1890 no case of Influenza had come under his notice; another reports only a few cases spread over three or four months, not amounting to an epidemic; another says that the epidemic was apparently over before he commenced practice on June 2nd, 1890; another reports "more cases than usual certainly; but " should not call it a special epidemic," and gives as date end of May, to end of July.

At other places where Influenza is reported to have been epidemic, the following dates are given:—

Locality.	Date of first case.	Date of commencement and decline of epidemic.
Pietermaritzburg -	May 8, 1890 -	May to July.
Ditto (another informant).	„ „ -	Abating in February 1890.
Ladysmith -	May 29, 1890 -	May 29 to June 30.
Ditto (another informant).	May 15, 1890 -	May to July.
Ixopo -	First week in April -	Beg. April to middle of July.
Umbazi -	- - -	Beg. of May to middle of July.
Pomeroy -	A few days before May 26. -	May 26 to June 26.
Umosti -	January 17, 1890 -	January 17 to April 22, and again May 18 to July 6.
Dundee -	End of May 1890 -	June and July.
Lion's River -	Beg. of June -	Beg. of June to July 24.
Newcastle -	About three months ago (? July 1890). -	July and August (?).

The Deputy-Governor reports, December 31st, 1890, that there had been no epidemic Influenza in Zululand.

British Bechuanaland.

Bechuanaland. The district surgeon of Vryburg reports that epidemic Influenza first occurred there at the end of April 1890, and lasted till the end of June. The disease was, in his opinion, introduced from Cape Colony, and spread chiefly through school children. Many cases were followed by pneumonia.

Shiré Highlands.

Shiré Highlands. Consul Buchanan, writing on October 11th, 1890, from Mount Zomba reports a severe epidemic of Influenza there. A good many people had died, both old and young. Most of the Europeans at Blantyre had had it in a more or less severe form. ("British Medical Journal," January 17th, 1891.)

Zanzibar.

Zanzibar. Outbreaks of Influenza occurred in March and April 1890 on board H.M.S.S. "Conquest," "Garnet," "Brisk," "Kingfisher," and "Reindeer," while at Zanzibar, or cruising in the neighbourhood.

Mauritius.

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Mauritius.

Dr. Antelme, secretary to the Medical Society of Mauritius, reports, July 11th, 1890, that there has been no epidemic Influenza in Mauritius. There have been, as usual every year at the change of seasons, a good many cases of "influenza" (grippe), but these have not exhibited all the symptoms attributed to Influenza in Europe. Later, however (December 5, 1890), in a communication to the Medical Society, he gives his opinion that Influenza began to appear in the Colony towards the end of April 1890.

From replies obtained by Dr. Lovell, chief medical officer, from medical men in the Colony, it appears that a severe epidemic of Influenza prevailed there in September 1890. The date of the commencement of the epidemic is given by most as August or the beginning of September; by one (at Port Louis) as the end of July; and by two or three as April, or the commencement of the cold season. (This, however, may refer to cases of "grippe," of the kind met with every year.) The epidemic reached its height in September, declining towards the end of the month or in the beginning of October, and was over apparently by November. The dates given in different replies do not show any definite direction of progress of the epidemic, except that Port Louis, the chief town of the island, seems to have been attacked before other parts; the replies from Port Louis giving the commencement of the epidemic as at latest the middle of August, whereas those from other places (with two doubtful exceptions only) give it as the end of August or the beginning of September. Dr. Vinson states ("Bulletin de la Société Médicale de l'Île Maurice") that the epidemic commenced at Port Louis in the beginning of August, and that from thence it spread to other districts. It was also stated to have been more severe at Port Louis than elsewhere, two-thirds of the inhabitants being estimated to have been attacked by it. In general the populous centres were the first visited by the Influenza, and the most severely affected. The mode of introduction was not ascertained, but it was thought to have been probably imported, as vessels coming from infected ports, as Madagascar, Bourbon, the Cape, and Rodriguez were admitted to free pratique without the least precaution (Dr. Fibich, loc. cit.). The epidemic commenced very suddenly, and its decline was equally rapid. All classes suffered, but the garrison escaped very lightly, only one case (3 according to the table on page 161) having occurred among the troops. Children suffered less than adults. The number of deaths in the Colony ascribed to Influenza was as follows:—

August	-	-	-	-	1
September	-	-	-	-	180
October	-	-	-	-	116
November	-	-	-	-	20
December	-	-	-	-	6
					<hr/>
Total	-	-	-	-	323
					<hr/> <hr/>

equal to a rate of about 0·88 per 1,000 inhabitants per annum. The death-rate from all causes during the epidemic period was much above average, being in September 47·6, and in October 33·0 per 1,000 population per annum, the average rates for the corresponding months of the four previous years having been 28·9 and 27·6 respectively.

Rodriguez.

The Government Medical Officer reports that at the end of June 1890 many cases of bronchitis came under his care, (the two first being on June 22nd), and in July the disease assumed an epidemic character. He seems to have regarded it as of the nature of Influenza, but states that nervous depression, frontal headache, and muscular pains were not very characteristic at first; the first cases resembling ordinary cases of bronchitis, but with a little more depression than usual. The whole population had had the disease, and no locality had been spared. It was most severe in cold wet weather, and among the poor on the mountain, and less so in the villages along the coast. It was believed to be contagious, but it was difficult to say how it could have been introduced, as between January and July 1890 the island had only three times had communication with the outer world by ships, all of which had clean bills of health. H.M.S. "Garnet" called on June 12th, and left the same day. The "Maggie Low" arrived June 17th. The name and date of arrival of the third vessel are not given.

[It will be seen from the Navy Returns on pp. 164 and 167 that Influenza had prevailed on board H.M.S. "Garnet" from March 16th to April 9th, 50 men out of a crew of 235 being affected. The possibility of Influenza having been started in Rodriguez by retained infection brought by this vessel cannot be excluded, nor are the dates given above inconsistent with this view.]

Seychelles.

Seychelles.

In reply to a circular from the chief Medical Officer of Mauritius, answers were received from four medical men in the Seychelles. The Government medical officer says (October 29th): "No case of Influenza has come under my observation. The epidemic has not reached Seychelles."

Two medical men, both at Mahé, describe an epidemic which had prevailed since September 1890, attacking children almost exclusively. The prominent feature of the disease was intense dyspnoea, commencing usually in the night, and ushering in a severe attack of bronchitis, accompanied by great exhaustion. The disease, however, was not in any instance fatal. One informant speaks of the dyspnoea as being preceded by malaise and coryza; the other as attacking patients apparently in perfect health.

The fourth correspondent at Praslin had had only two questionable cases of "influenza," both in February 1890.

Réunion.

Réunion.

Dr. E. Vinson, of Mauritius, states, as showing the contagious nature of Influenza, that his sister who had been on a visit in his house for a fortnight at the time when Influenza prevailed in his family, left on September 23rd with preliminary symptoms, and arrived on September 25th at Réunion at a house in the country, which was previously completely free from the disease. She was laid up with Influenza, and two days later the family and servants contracted the disease.

Abyssinia.

Abyssinia.

Telegrams from Massowah in November 1890, state that Influenza had broken out at Shoah, and had attacked certain Italian officials.

ASIA.

Arabia.

Her Majesty's Vice-Consul at Cameran reports on April 3rd, 1890, that an epidemic of Influenza had broken out in Hodeidah, and was spreading in the Yemen. Many of the pilgrims on board the ships coming from India and the Straits Settlements were also suffering from Influenza. [Perhaps the epidemic may have been imported by these pilgrims.]

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Arabia.

Persia.

Influenza prevailed at Teheran about January 3rd. Horses had previously been affected with a similar disease. Persia.

At Tabriz it prevailed at the same time in a more severe form ("British Medical Journal," February 15th, 1890).

It was abating on January 27th.

India.

Influenza occurred among the troops, at Lucknow, about February 22nd ("British Medical Journal," April 5th, 1890), and at Bombay, before March 8th (*Id.*, March 8th, 1890). In the Navy return it is stated to have existed on shore at Bombay early in January; though the crew of H.M.S. "Mariner," who were lodged on shore, were not attacked until March 2nd. Dr. Squire says that it began at Bombay towards the end of February, but was called dengué. India.

By March 18th it was epidemic at Lucknow, Bombay, Poona, Benares, and Meerut. In these places Europeans are said to have suffered first, the epidemic afterwards spreading to the native population, but at Calcutta, the disease, which had at first been confined to the native quarters, is reported in April to be extending to the offices in which Europeans were employed ("Lancet," April 12th, 1890).

Surgeon F. Wyville Thompson, M.B. (stationed at Dehia Dun, an elevated station), gives an account ("British Medical Journal," May 31st, 1890) of an outbreak among a regiment of native troops. Influenza had been prevalent in the neighbourhood for some weeks before it attacked the troops. The first cases in the regiment appeared on March 25th, and by April 1st nearly half the men were attacked. The great majority of the cases were very mild, and a distinct morning intermission was noticed, the temperature falling to normal and rising again in the evening. No European officers nor their families were attacked.

Surgeon-Major P. M. Ellis (Kamptee, Central Provinces) writes (*ibidem*):—

"The belief which seems to exist in some quarters as to the marked influence of meteorological conditions on the production and spread of Influenza, will, I think, hardly find support in the experience afforded by the widespread distribution of the disease in this country under very varying conditions of soil and temperature. The history of the epidemic in India all tends to show the influence of human intercourse on the spread of the disease. Appearing first in Bombay at the latter end of February or early in March, it seems to have been very closely connected with the movement of European troops, its almost simultaneous appearance at Delhi, Lucknow, and the large military stations in Northern India, being probably attributable to the arrival of drafts from England, which at that season of the year are constantly passing up country to join the various regiments. At this station, which is off the main line, the first three or four cases were clearly importations,

and the disease did not appear in an epidemic form until fully a month after its period of maximum prevalence in Bombay, and its first appearance at hill stations seems to have been still later, and to have been connected with the annual migration from the plains. It is difficult to find any meteorological conditions common to such places as Simla, with its cool and temperate climate; Bombay with its warm and moisture-laden atmosphere, and a station like this with its hot dry climate and a temperature of over 100° in the shade."

The Army returns show 3 cases of Influenza in February among the European troops in Oude (Lucknow), 137 in March, and 135 in April. In April there were 209 cases at Allahabad. The epidemic continued through May, disappearing in June.

In the Bombay district, Influenza began among the troops in March, in which month 102 cases occurred, 86 of them at Mhow (a station about 300 miles N.E. of Bombay). In April the cases were most numerous at Nagpore and Scinde, further from Bombay to the east and north. The epidemic was over before June.

In Madras the epidemic among the troops began in March, reached its height in April, and disappeared in the course of June.

Burmah.

Among the troops in Lower Burmah it began in April (three cases), prevailed in May and June, and was over by July.

The Influenza epidemic is reported in the "British Medical Journal," of May 3rd, 1890, to have reached Mandalay (Upper Burmah); 98 cases occurred in May among the troops in that district, 43 cases in June, and others up to August.

It is reported to have commenced on December 1st, 1890, at Gilgit, Kashmir, a remote place in a valley in the Hindu Khush mountains, having been brought by a party of Mussulman priests from Chitral, about 200 miles to the west.

(J. H. Roberts in "Lancet," March 7th, 1891.)

Ceylon.

Ceylon.

Dr. Kynsey, principal civil medical officer, states that there is no record of any previous epidemic of Influenza in this colony, although there are annual outbreaks of catarrh and fevers.

The first cases of Influenza in this Island occurred about February 7th, 1890, among pilot boatmen employed in the harbour of Colombo, after the arrival, on January 30th, of the troopship "Himalaya," with 19 cases of Influenza on board, there having been 140 cases on the voyage from Plymouth (*see* page 164). An early case also occurred in a post-office clerk engaged in sorting the mails.

The epidemic commenced in Colombo, was at its height in the middle of March, and declined there in the middle of April, but cases continued to be reported up-country until the middle of July. It prevailed extensively in the planting districts, among the labourers in the tea and coffee plantations; also at the pearl fishery where some 30,000 persons were collected. It was most prevalent among persons living in communities. In places up-country the disease often commenced among the petty traders in the bazaars, and spread to estate labourers and villagers who came to purchase provisions. Those attacked were mostly adult males, next in frequency adult women, and children least of all. In some districts the disease appeared after the arrival of a person suffering from it, but in certain instances imported cases were not followed by others, and in other instances no history of importation could be traced, and the disease broke out in several centres simultaneously. The disease also decreased, and almost disappeared in a district, and then without any apparent cause reappeared and spread.

The Austrian man-of-war "Aurora" arrived at Colombo from the East on February 27th, all on board being healthy. She left early in March for Trieste, and on the voyage 90 men suffered from Influenza.

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The epidemic was almost confined to Colombo, the Central Province and the Province of Siva, where most of the planting estates are situated, and the pearl fishery at Marichikaddi.

Dr. Kynsey gives the following table, showing the date and extent of the epidemic in different districts:—

District.	Date of First Case.	Date of Maximum of Epidemic.	Date of Decline of Epidemic.	Probable Number of Cases.*
Colombo	7th February	Middle of March	End of April	Several thousands.
Kandy	23rd March	23rd April	8th May	200.
Maturata	5th April	18th April	22nd May	257.
Kellabokka	First week April	Last week April	May	2,000.
Nuwara Fliya	28th March	10th April	Middle of May	88·9 per cent. of population.
Ramboda	15th April	20th April	15th May	250.
Maskeylie	6th March	3rd April	End of May	2,000.
Lindulle	22nd April	Middle of May	July	7,000.
Haputate	End March	Beginning of May	End of May	3,000.
Oovah	23rd April	Middle of May	End of May	Several thousands.
Dickoya	3rd March	April	May	1,000.
Chilow	28th March	—	—	1.
Kurunagalle	10th May	—	—	4.
Kalutara	End of March	—	—	2.
Dimbula	6th April	Middle of May	Middle of June	Several thousands.
Teldenia	30th March	April	End of May	1,000.
Deltotti	13th April	May	July	500.
Marichikaddi	End of March	Middle of April	End of April	4,000.

(A map appended to his report by Dr. Kynsey shows that Dickoya, where the epidemic appeared next after Colombo, is in the Central Province, near the terminus of the railway. Maskeylie, attacked next, is near Dickoya. Kandy, attacked March 23rd, is also on a railway. Marichikaddi is on the west coast in the north of the Island, and is the scene of a large concourse of merchants and persons engaged in the pearl fishery. Places invaded later by the epidemic are in the centre of the Island and away from railway communication. Kalutara and Chilow, where Influenza occurred, but did not spread, are on the west coast, the former near Colombo, the latter between Colombo and Marichikaddi. It is perhaps a question whether the apparent special incidence of the epidemic upon persons employed on the plantations and at the pearl fisheries may not have been due to the better opportunities of obtaining information of its presence at those places.)

Among the troops in Ceylon, the only case of Influenza recorded in 1890 was one in December at Colombo.

Straits Settlements.

Dr. Mugliston, acting principal civil medical officer, states that an epidemic of Influenza, with severe symptoms of nervous depression, frontal headache, pains behind the eye, and in the muscles and back, but without much coryza, has existed in Singapore, Malacca, Penang,

Straits Settlements.

* These figures are approximate only. Dr. Kynsey believes that a very much larger number of persons were attacked.

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and Province Wellesley. The dates of its first occurrence and decline are given as follows:—

Settlement.	First occurred.	Decline.
Singapore - -	Third week in February 1890 - -	First week in May.
Malacca - -	First week in April - -	In April.
Penang - -	First week in March - -	Middle of May.
Province Wellesley -	In March - -	May.

In Penang it was noticed that the disease first occurred in the native bazaar, where coolies were employed in opening cases of "piece goods." In Province Wellesley it was considered that the disease spread by atmospheric changes undetermined by any defective sanitation.

In Singapore, Dr. Mugliston is of opinion that the disease was introduced by ships,* and that it attacked first the wharf coolies who became infected by contact with them; and that after its introduction there could be no doubt as to its spread from person to person. The largest number and per-centage of cases occurred among the Chinese coal coolies at the wharves; these men live together in a large building very much overcrowded. The coolies and clerks in merchants' stores where the "piece goods" were opened did not suffer to anything like the same extent. All communities and all localities were affected, but European ladies comparatively escaped, which may be accounted for by their living all day in the country in large well-ventilated houses, and being thus comparatively little exposed to chances of infection. Only one case of Influenza is recorded among the troops in March.

Borneo.

Borneo.

Dr. Walker, principal medical officer of the Government of British North Borneo, reports that the first distinct case of Influenza in the town of Sandakan occurred on March 4th, 1890, but that a prevalence of bronchial catarrh and pneumonia was noticed in the latter half of February. The epidemic at Sandakan was most severe during April, beginning to decline about the middle of May. There was no distinct evidence as to its origin. A vessel infected with the disease was known to have arrived from Singapore, but after the tendency had declared itself at Sandakan. It was first noticed among the police (Sikhs), and did not appear in the gaol, which is within 50 yards of their barracks, for nearly a month afterwards. The general community was affected a little before the gaol.

Labourers in the tobacco plantations were severely affected.

China.

China.

The Governor of Hong Kong sends a communication from Dr. H. R. Robertson, surgeon to the Pei Yang squadron of the Chinese Imperial

* The port medical officer of Hong Kong says that one of the P. and O. steamers landed five cases of Influenza at Bombay, and then came on to Hong Kong via the Straits in the month of December. Following on her track Influenza has been reported as prevalent in Singapore in December.

The Navy return states that a few cases of Influenza had existed on shore at Singapore before January 27th, when the first cases occurred on H.M.S. "Orion" there, but the disease was not then widely prevalent.

Navy, on an outbreak of Influenza which occurred on board the flagship "Ting Yuen," then lying in Kowloon Bay, in the early part of February 1890. On being summoned on board the "Ting Yuen," Dr. Robertson found 22 of the sailors suffering from unmistakable symptoms of epidemic Influenza; the next day 18 fresh cases were recorded, and the third day 10, after which no more occurred. The patients were mostly healthy sailors, only two cases occurring among the officers. Dr. Robertson himself subsequently suffered from Influenza, but no case occurred on either of the other ships of the squadron. The cause of the epidemic was obscure. The "Ting Yuen" was not lying with the other vessels, but anchored by herself some 400 yards from the entrance to the dock, and nearer to Hong Kong than the other vessels. The fact of her being flagship would entail more frequent communication with Hong Kong in her case. The squadron had come from Formosa, and before that from Shanghai.

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Cases of "Influenza" accompanied by depression, headache, and muscular pains, occurred in Hong Kong in January, but were neither numerous nor severe. The English mail steamer arriving in January had some cases of "Influenza" on board, as had also the American mails arriving in January and February.

Hong Kong.

A mild type of Influenza is said to have assumed epidemic proportions about the end of February 1890, disappearing about April. The disease apparently began among the Chinese, and spread first to the Portuguese, and subsequently to other European nationalities (no case was recorded among the troops). The disease, whatever it was, in the opinion of Dr. Jordon, health officer of the port, was probably brought by the large number of Chinese emigrants from Singapore to Hong Kong.

There was also much sickness, principally coughs with fever, among the Chinese at Kowloon.

In the "British Medical Journal" of April 26th, 1890, it is stated that Influenza had been prevalent for some time past in Tientsin, and half of the native population had been attacked.

In English newspapers in July, it was stated that Influenza was spreading rapidly in China, and had attacked half the population of Peking and other large towns, business in consequence being almost at a standstill.

In the "British Medical Journal" of January 3rd, 1891, on the other hand, it is stated that "Influenza is said to be prevalent in China, but the disease is as yet of a decidedly mild type."

A communication received through the Colonial Office from the Commissioner of Chinese Imperial Customs at Mêngtzii in the province of Yünnan, in the south-west of China, dated October 2nd, 1890, states that epidemic Influenza, which came, as far as he could learn, by the Yangtze route, had been prevailing in the province of Yünnan for some weeks, causing considerable loss of life in the capital and in the neighbouring city of Lin-an-fu. It had appeared in a mild form at Mêngtzii, but, if the number of sick among the employés of large firms were a fair criterion whereby to estimate the prevalence of the epidemic in the town, one might almost say that four out of every five persons had suffered from it.

Japan.

An epidemic of Influenza is said to have commenced in February 1890, and reached its climax in April, dying away towards the beginning of summer. It was followed by a violent epidemic of cholera, believed

Japan.

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to have been imported from China, in which 22,560 persons died. ("British Medical Journal," December 27th, 1890.)

In Tokio alone 100,000 cases of Influenza are said to have occurred. (*Ibid.*, September 20th, 1890.)

AUSTRALASIA AND POLYNESIA.

New Zealand.

New Zealand.

Influenza was reported at Dunedin on March 17th. On the 21st it was on the increase there, and had also occurred at Wellington.

On March 29th it is reported at Christchurch, and at Auckland early in May, by which time it had nearly disappeared from the South Islands. Sir James Hector, M.D., reports that epidemic Influenza (which was frequently complicated with derangement of the liver, or with bronchial catarrh) first appeared in Otago in the first week of March. It was supposed to have arrived via San Francisco. It appeared first in the south, where the weather was cold and damp. It has gradually spread through all parts of the colony, even amongst the miners living in mountain villages. All kinds of persons were affected. Horses had coughs very commonly.

Australia.

Australia.

Victoria.

Victoria.—Dr. Gresswell, Medical Inspector to the Board of Health, states, through the Colonial Office, that the Influenza epidemic commenced in Victoria early in March 1890, but the date cannot be fixed with precision. There is much to be said for its identity with other outbreaks in the colony in previous years, and especially with an outbreak which occurred in 1885, and which went by the name of "fog-fever."

The outbreak of 1890 assumed epidemic proportions very rapidly, being widely prevalent in June, and it declined rapidly after June. More recent and localised recrudescences of the disease are reported. There was no evidence as to its mode of origin or spread. A large number of medical practitioners regard its spread by personal infection as doubtful. In certain institutions having had little communication with outside the disease did not appear while it was very prevalent in the immediate neighbourhood of those institutions.

New South Wales.—A valuable report on the epidemic of Influenza in New South Wales in 1890 was made to the Board of Health by Dr. Ashburton Thompson based upon a collective investigation. A series of questions was sent to every known medical practitioner in New South Wales (675 in all), and the number of available replies was 270, 130 being from Sydney and 140 from the country. The number of places from which replies were received was 94, Sydney being reckoned as one place. The reports were classified as follows.

Number.	Class.	Tenour.
178	(I)	Influenza reported.
40	(O)	Influenza reported not to have occurred, and no other disease mentioned.
24	(a)	Epidemic catarrh described, and the disease said to be the same as that usually met with about autumn and spring.
17	(b)	An epidemic disease observed; said not to differ or not to differ much from epidemic catarrh, but the description betokening Influenza.
11	(X)	Imperfect reports.
270		

New South
Wales.

Collective
inquiry by Dr.
Ashburton
Thompson.

The symptoms of the disease, as generalized from 178 (I.) reports closely resembled those observed in this country. The onset was sudden, almost always at early morning hours; often with rigors. The temperature often showed a very early rise to the summit, and rapid defervescence which was often complete by the 48th hour. Pains in head (frontal), back, and muscles of limbs were almost invariably mentioned. Absence of coryza and lachrymation was often specifically mentioned as a characteristic; but rather often one or other or both were mentioned as being present. Rashes were noted by seven observers. No question was framed as to the contagiousness of Influenza, but several reporters discuss this point; these in about equal numbers allege it to be more or less contagious than the ordinary seasonal epidemic catarrh. Three say that in their experience the disease never ran through households, but that solitary cases were alone seen. The question "Does the present illness differ from the epidemic catarrh often seen in the colony?" was answered in the affirmative by the 178 reporters who made (I.) reports, and the following were cited by them as its distinguishing symptoms in frequency as shown below.

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Clinical
characters.

Symptoms of Influenza, distinguishing it from ordinary epidemic catarrh.	Answers.
Prostration or depression - - - - -	111
Severity of pain in spine, muscles, or bones - - - - -	89
Absence or late appearance of coryza - - - - -	77
Rapid and great rise of temperature - - - - -	42
Intensity of headache - - - - -	61
Suddenness of onset - - - - -	30
Frequency of gastric derangement (diarrhœa and vomiting) - - - - -	33
Greater frequency of pulmonary complications - - - - -	11
Less frequency of pulmonary complications - - - - -	5
Close resemblance to onset of typhoid or rheumatic fever - - - - -	4
Cardiac weakness, lividity - - - - -	2
Greater severity of general symptoms - - - - -	15
Subsequent neuralgia - - - - -	4
Derangement of hepatic function - - - - -	4

The first cases believed to be Influenza brought to light by the inquiry were two which occurred at Hillston, a small and remote township, in July and August 1889. The next reported case occurred at Albury, an inland town, on December 6th, and the next in Sydney on December 25th. As no others occurred until nine weeks afterwards, it is scarcely possible to regard these as belonging to the epidemic period.

Dates of epi-
demic.

The table on page 44, abridged from Dr. A. Thompson, shows the weeks in which the several reporters in Sydney and in country places met with their first case of Influenza.

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Week ending	Number of Practitioners in Sydney who noted their first Case of Influenza.	Number of Country Places newly attacked.	Number of these Country Places which have Railway Stations.
1. March 4 - -	3 (a) - -	—	—
2. „ 11 - -	4 - -	1.	—
3. „ 18 - -	3 (b) - -	2 - -	1.
4. „ 25 - -	7 (b) - -	3 - -	1.
5. April 1 - -	36 (b, a) - -	1 - -	1.
6. „ 8 - -	30 (a) - -	7 (b) - -	5.
7. „ 15 - -	18 (b, b, b, b, a, a).	11 (a) - -	11.
8. „ 22 - -	5 - -	10 - -	7.
9. „ 29 - -	3 (b, a) - -	6 - -	1 (and 2 by sea).
10. May 6 - -	2 - -	3 (b) - -	1.
11. „ 13 - -	— - -	3 (b, b) - -	1 (and 1 by sea).
12. „ 20 - -	— - -	7 - -	2.
13. „ 27 - -	— - -	2.	—
14. June 3 - -	— - -	3 (a) - -	3.
15. „ 10 - -	— - -	1 (a) - -	1.
16. „ 17 - -	— - -	3 (a, a) - -	1.
17. „ 24 - -	1 (a) - -	1 (b) - -	1.
18. July 1.	—	—	—
19. „ 8 - -	— - -	1 (b).	—
20. „ 15 - -	— - -	1.	—
21. „ 22.	—	—	—
22. „ 29 - -	— - -	1.	—
23. August 5 - -	— - -	1.	—
29. September 16 - -	— - -	1.	—

(The letters (a) and (b) indicate reports classified as before mentioned, reports so distinguished being included in the numbers in the table.)

Gradual progress.

During the first four weeks there was a small but increasing number of invasions in Sydney; then the two succeeding weeks each yielded a large number of fresh invasions; in the seventh week the number lessened considerably, and during the eighth and ninth weeks the out-

break declined rapidly to its close in the tenth. The course observed in the country was similar but more prolonged, *i.e.*, during the second, third, fourth, and fifth weeks of the Sydney period very few country places were invaded. In the sixth week the number of fresh invasions increased largely, and during the seventh and eighth weeks the greatest number of fresh invasions (of localities) were reported. Thereafter the numbers declined, although one or more fresh invasions occurred in every week down to the 17th; after the 17th intervals began to occur, and the last report of a fresh invasion was made for the 29th week. In Sydney the epidemic ceased soon after the 10th week, although a few scattered cases were heard of as late as the end of October.

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In New South Wales all places on railway lines are in daily communication with the capital. Places on coach routes, or on the coast or large rivers, with few exceptions, get mails and passengers at least three times a week and many daily. Nearly every place is so connected with the capital that the traveller may reach it within five days at the most, often within two days, and most often within one day.

The course of the epidemic, both in Sydney and in the country, says Dr. A. Thompson, appears to be consistent with what is observed in some communicable diseases. Nothing seems clearer to him after examination of the map and tables given in the report than that the phenomenon of simultaneous attack over very large areas of country was not exemplified in New South Wales. Everywhere is found the same evidence of gradual extension of the disease. In Sydney and other large cities, if its progress were not actually slow, it was not, at all events, exceedingly swift, and when large areas of country come to be regarded it appears that its extension was deliberate and in no case faster than a man could very easily travel. On the other hand the behaviour of the epidemic in public institutions seemed to Dr. Thompson to furnish nearly conclusive evidence that direct contagion between sick and well was not a cause of the observed epidemic prevalence; and he suggests that, while human intercourse seems to be necessary to transport the contagion of the disease, some stage intermediate between man and man may be necessary to its spread in an epidemic form.

Etiology.

The temperature during the first half year of 1890 in Sydney was slightly below the average. The rainfall was excessive and continuous, far exceeding in amount any year since 1840. No concurrent epizootic was reported. Spores of the common mould fungi were unusually abundant at Sydney (?in the air) in the first six months of 1890. Insects of all kinds were unusually abundant during the summer of 1889-90 owing no doubt to the ample rains and consequent abundance of food.

Meteorology.

Special inquiry was made as to the symptoms and behaviour of a disease thought to resemble Influenza closely, which is met with every year in some or many rural localities, and which, in New South Wales at all events, seems to be associated in its origin with assemblage of large numbers of men and sheep in the sheds at the shearing season. This disease is sometimes called "fog fever," but for the reason hinted at, and because fogs are not common in sheep country, Dr. Thompson prefers to speak of it under the trivial name of "Shearing-shed fever." Only three accounts of it were obtained; they are as follows:—

Fog fever.

1. Dr. George A. Boodle, Walelea, writes:—

"Our epidemics of catarrh of an Influenza form are not confined to the shearing season, but may appear at any time; but in my experience of 11 years, chiefly in this district, it always appears more or less at that

time, obtains its greatest development in shearing sheds, and appears to spread from them to the surrounding population as though contagious, though I have no direct evidence to prove that is so. As we have an altogether unusual number of sheds within a few miles of the town, it is more likely to be marked here than in other places.

It is most marked in dry sunny springs, when there is great sun-heat and cold winds, when men get overheated in the sheds or in working in the sunshine; work producing abundant perspiration and the probability of subsequent chill. It was particularly prevalent in the shearing seasons of 1886 and 1887, and much less than usual in 1888 and 1889. Shearing begins here about 1st November and ends early in December, a time when, in this climate, there is apt to be a great daily temperature range (40° or more, sometimes 80° to 30° , and I have taken daily observations for many years), and a great difference between sun and shade temperature.

The complaint usually begins with dryness and soreness of the nasopharynx, speedily followed by great prostration—the strong men so frequently attacked being forced to lie up—chills, pains in the limbs, frontal headache, fever, and general malaise. The face looks pinched, pale, and dusky, or sometimes flushed and appearance of severe illness. At first sight, cases suggest typhoid fever. The duration is about three or four days, and convalescence fairly rapid, but relapses, often repeated, are common. It does not often lead to lung complications, but pneumonia and pleurisy are often prevalent at the same time. As in the late Influenza, many of the cases simply follow the course of ordinary catarrh. The great Influenza epidemic differs from this only in matters of degree:—

- (1.) A far greater number of people were attacked.
- (2.) A greater number of cases (something less than half) had no respiratory catarrh, and gastro-intestinal affections were more common.
- (3.) A greater proportion of children were attacked.
- (4.) The fever, I am inclined to think, was as a rule higher.

To sum up. I should have no reason to suppose that the shearers' affection was a distinct form of catarrh following, as it usually does, certain climatic conditions and predisposing conditions of employment, and being, as it often is, much mixed up with other results of the same causes. But it is worthy of notice for the following reasons:—

1. It has acquired popular recognition as a distinct disease known as the "dog disease" or "shearers' cold."
2. Its remarkable likeness to the late Influenza epidemic.
3. Its appearance of contagiousness and spreading from the sheds.
4. Many cases equalled in severity, the worst cases in the late epidemic."

II. Dr. Colpe, of Nymagg, draws the following distinction between Influenza and shearing-shed fever: "Influenza (as observed during the present epidemic)—mostly sudden onset, but in about 10 per cent. of cases previous 8 or 10 days of ill-health. Violent pains over eyes, and in eyeballs, pains in back and limbs; temperature from 100 to 102 ; cough in many cases. It differs from the epidemic catarrh often seen in this colony. It closely resembles the catarrh common here among shearers at shearing time only; but the elevation of temperature is higher; the pains are not limited to the back and lower ribs, but are almost invariably also in forehead, often in lower limbs. Complicating symptoms are: tinnitus, spasm in arms and legs, tenesmus vesicæ,

“vomiting not infrequent.” He also writes:—“To give information about the so-called ‘shearing-shed catarrh’ as correctly as possible, I decided to watch the disease more closely this year than I had done before, but to my regret all sheds have cut out now without any fresh cases occurring. The disease, as it comes under the notice of the general practitioner, usually offers little clinical interest, the patients being rarely seen personally by their medical attendant; the sheds are mostly far away from town, the men are apparently not dangerously ill, and therefore the station-manager usually only sends a letter roughly describing the symptoms under which a number of the hands took ill; the medicine is then sent out to them—mostly expectorants and powders of acetanilid and Dover’s powder in equal doses. Some of the men ride into town, but when seen by the doctor they usually are already greatly under influence of drink, and are no good subjects for observation. A number of cases, however, become complicated later on with true croupous pneumonia, of which I saw seven instances last year, and eight the previous year, in a district and amongst a population where pneumonia otherwise is extremely rare. Of the not complicated cases I have, I must admit, hitherto taken but little notice; and I regret that, at this season, for the first time, the disease did not appear. Shearing having been delayed this year into the warmer season, on account of the various strikes, has possibly been the cause of the immunity this time.”

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III. Dr. Lyttleton, of Adelong, gives the following account:—“I regret to say that I have but few notes *re* fog fever, shearers’ catarrh, or ‘influenza,’ euphoniously called Temora rot. I have been here eight years, but saw no fog fever till 1885 to 1889. There has been none this year, which is curious, considering the Influenza epidemic and the specially rough, cold, and wet season. Fog fever here was general, temperature 103-105, pains all over, especially in head, always more or less bronchitis, with patches of mild pneumonia, sometimes capillary bronchitis. The pneumonia is usually of a mild type, but in 1886 there were three deaths from severe pneumonia. The Influenza here was not very severe, except a few cases amongst children, symptoms much the same as fog fever, but pain in head and limbs more severe, attack of shorter duration, but almost in every case leaving severe pain in thorax, or in my own case pain for six weeks in right iliac fossa. This after pain has in many cases been very severe and far more annoying than the actual attack. Whether the pain was in thorax or abdomen, in no case could I find any cause, and it usually wore off after a longer or shorter period, not exceeding two months. In Influenza here there was great lassitude for a considerable time after the attack was over. I cannot believe either complaint to be contagious, as in many cases only one member of a large family was attacked. In my own household I was the only one. I do not see that there is any practical difference, either in symptoms or treatment, between fog fever and Influenza.”

South Australia.—Dr. Whittell, president of the Central Board of Health, reports to the Colonial Office that a few deaths, from three to eight per annum, from “influenza” are registered nearly every year in South Australia; these are probably severe cases of ordinary catarrh. In 1860 there was a general epidemic of Influenza, with symptoms similar to those seen in England some years previously: 28 deaths were reported, in a then population of 126,500.

“Early in March of the present year Influenza was reported to be prevalent in New Zealand, and so far as I could learn, it began to

show itself in Melbourne and I believe also in Sydney, about 10 to 14 days afterwards. A few days later it appeared in South Australia and spread rapidly in all directions. The question as to its method of spread is exceedingly difficult to answer. I incline to the belief that contagion is the chief factor. It is highly probable that whatever may be its nature the contagion was carried by way of America to New Zealand, and thence to the Australian Colonies:—to Sydney and Melbourne first, thence to South Australia, and later on to Western Australia. The rate of progress does not appear to have been more rapid than that of steamers between these places.”

The first death recorded from Influenza in South Australia occurred on April 25th, and six others were registered before the end of the month, 33 in May, and 8 in June down to the 19th, making a total of 48 deaths in a population of about 319,500; 4 of the 48 deaths occurred in Adelaide, 8 in suburban places near, and the remainder in more or less remote towns and country districts. Besides the deaths attributed to Influenza, at the time of the epidemic the general mortality from all causes was unusually great, the deaths registered in May 1890 being 444, against 305 in May 1889, the former number being the largest number ever recorded in May in South Australia.

The first case of Influenza recorded was on March 25th, 1890, at Kingston, a small town on the coast between Adelaide and Melbourne. The epidemic was general, and not confined to particular communities or localities. On June 23rd it was on the decline, but had not quite disappeared.

“Influenza” is stated to have been very prevalent and fatal among horses in the north of the colony, at places far apart.

Queensland.

Queensland.—In reply to a circular sent by the Central Board of Health to all medical officers and hospitals, 10 informants reported the presence, and 19 the absence, of epidemic Influenza in their districts, while 1 reported a few cases only. The dates of the first observed cases varied from the middle of April to the 7th July. The epidemic began in May or June, in one not till July, and appears in most districts to have been declining by the end of July. Some medical men attribute it to infection conveyed by persons or letters; others to the cold and changeable weather. No special incidence on any particular class of persons was observed.

Western Aus-
tralia
? epidemic.

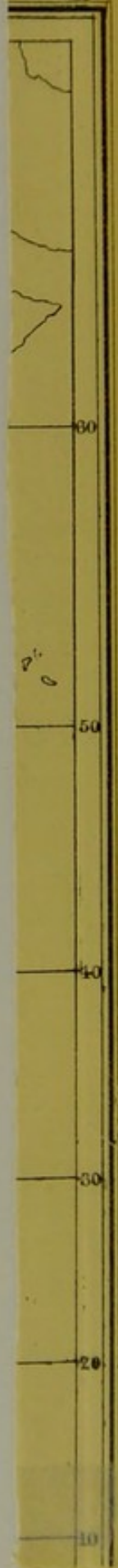
Western Australia.—The acting Colonial surgeon reports that an epidemic of Influenza, marked by the usual symptoms, has recently prevailed in the colony; it was characterized by its wide dissemination and mildness. He states that epidemic Influenza has been noticed by the older settlers from the early days of the colony, and epidemics have occurred annually for years past. In 1859 the then Registrar-General of the colony reported that there were two epidemics yearly, and the symptoms given by him closely resemble those of the recent epidemic.

(It may perhaps be doubted whether the disease in question is the true epidemic Influenza, or the “fog fever” or “shearing shed fever” already mentioned.)

English newspapers of July 1st state that Influenza was very prevalent in the more settled parts of the colony when the last mail left. In Perth scarcely a family had escaped, and some schools had had to be closed.

British New Guinea.

No epidemic Influenza is reported to have occurred up to June 19th 1890.



Tasmania.

The Government Medical Officer reports to the Colonial Office that Influenza first occurred in March 1890, and at once became epidemic, dying out in July. There was no evidence as to its mode of origin or introduction. Cases occurred throughout the colony. Horses, cows, and dogs were reported to have been attacked.

In the Navy return (p. 165) it is stated that the Influenza existed on shore, and was spreading on March 27th when H.M.S. "Rapid" left.

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Tasmania.

Fiji.

Mr. Corney, Colonial surgeon, Fiji, in the Transactions of the Epidemiological Society, 1884, states that he has noticed several times during an eight years' stay in Fiji the occurrence of a distinctly epidemic outbreak of "influenza," or as he prefers to call it, "epidemic nasopharyngeal catarrh." He concludes that it is distinctly a zymotic disease; that it is disseminated by means of specific germs which originate in, or first reach, the windward portion of the group, and are carried by the trade wind to leeward, and that the epidemic spreads by this means rather than by infection from man to man, whole villages being successively attacked in a wholesale manner as the disease spreads westwards. One attack affords no protection against a repetition. Adults and older people seem to suffer more than children.

It is stated that no epidemic Influenza has been observed during 1890 in Fiji. Towards the end of May during cold weather a prevalence of catarrhal complaints was met with, but medical men who had observed epidemic Influenza in England were unanimous in regarding these as merely common catarrh. About the same time a few cases of smart fever, with headache, pains in the eyeballs, quasi-rheumatic pains in the limbs and blotchy red rash were observed, but these were recognized as dengue.

Sandwich Islands.

Influenza was prevalent at Honolulu by January 14th, 1890. (Navy Return, p. 163.)

Sandwich
Islands.

CHRONOLOGICAL TABLE.

The dates of occurrence of the Influenza epidemic of 1889-90 at different places are summarized below:—

Chronological
Table.

Date.	Locality.
1889.	
May - -	Greenland. Athabasca. Bokhara.
October 15, about	Tomsk.
" 27 - -	St. Petersburg.
October end - -	Durban (Natal). (?)
November 12 - -	General in Russia.
" 17 - -	Jamaica.
" 17 - -	Paris. First reported case.
" 26 - -	" Epidemic began.
" 30 - -	Berlin. (First case. Epidemic, December 12th.)
" 30 - -	Vienna. (" " " 11th.)
" (?) - -	First cases in London.

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Date.	Locality.
1889.	
December 3	- Heligoland.
" 7	- Copenhagen.
" 9	- Stockholm. Craccw.
" 9	- Somewhat prevalent in West London.
" 13	- Madrid.
" 15	- Belgrade. Buda Pesth. Spezia. Odessa.
" 16	- Inverness. (First case. Epidemic, December 31st.)
" 17	- Leith (Edinburgh), imported from Russia. Epidemic, January 7th.
" 17	- Antwerp. Epidemic in Holland.
" 17	- Rome. First cases. Epidemic, December 29th.
" 17	- New York. First cases. Epidemic, December 27th.
" 18	- Boston, U.S.A.
" 18	- General in large towns of Germany.
" 19	- Buffalo. Detroit. Kansas City.
" 20	- Lisbon.
" 21	- Dover. First case. Dublin, ditto. Epidemic, January 11.
" 23	- Birmingham.
" 23	- Chicago. First case.
" 24	- Sofia. Epidemic.
" 25	- Merv.
" 25	- Alexandria. First case. Epidemic, January 23rd.
" 26	- Engadine.
" 27	- Philadelphia. Baltimore.
" 28	- Christiania.
" 29	- Constantinople.
" 30	- Malta. Corfu.
" 31	- Cork. (First case. Epidemic, January 12th.)
" end	- Athens.
" middle or end.	- Cyprus. Epidemic, January 1st.
1890.	
January, beginning.	- Cape Town. Imported by steamers.
January 1	- London. Epidemic began.
" 1	- St. Louis, New Orleans.
" 2	- Gibraltar.
" 3	- Canada. Persia (Teheran. Tabriz).
" 4	- Liverpool.
" 5	- Algiers. General in Switzerland.
" 5	- Esquimalt.
" 8	- Tunis. General in British North America.
" 10	- Spreading in Corsica and Algeria.
" 10	- Cairo. Epidemic, January 22nd.
" 10	- Guernsey.
" 12	- Belfast. (Epidemic.) Galway. (First case.)
" 12	- Zara (Dalmatia).
" 14	- Alderney.
" 14	- Honolulu.
" 17	- Mexico.
" 22	- St. Vincent (West Indies).
" 24	- Palermo.
" 27	- Sardinia.
" 31	- Guatemala.
" end	- Tobago. Epidemic, middle of February.
" "	- Antigua. Chili.
" "	- Bermuda (?) St. Vincent (Cape Verde Islands).
" "	- Monte Video.

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1890.		
February 1st week	Penang. St. John (Newfoundland).	
" 2 -	Buenos Ayres. Monte Video.	
" 7 -	Colombo (Ceylon). First cases. Epidemic, middle of March.	
" 9 -	St. Kitts.	
" middle -	Sierra Leone. Gambia.	
" " -	Japan. Began. Epidemic at height in April.	
" 3rd week	Singapore. (? Earlier.)	
" end -	Hong Kong. Man-of-War in Kowloon Bay (China).	
" 22 -	Lucknow. First Case. Epidemic third week in March.	
End February or beginning March.	Bombay.	
March 4 -	Sandakan (Borneo).	
" 1st week -	Otago, N.Z. Sydney. Melbourne.	
" middle -	Epidemic at Lucknow, Bombay, Poona, Benares and Meerut.	
" -	Calcutta. Madras. Epidemic, April 1st.	
" -	Zanzibar (?).	
" 17 -	Dunedin, N.Z.	
" 21 -	Wellington, N.Z.	
" 29 -	Christchurch, N.Z.	
" 25 -	Tasmania. South Australia.	
" " -	Bermuda (Ireland Island).	
April 3 -	Hodeidah (Arabia).	
" 3 -	Ecuador.	
" 1st week	Malacca.	
" -	Brazil. Peru.	
" -	Lower Burmah.	
" -	Tientsin. (China. (? before.)	
" -	Queensland, began. Epidemic, May-July.	
" 15 -	Barbados. Epidemic, May.	
April and May	Gold Coast.	
May, beginning	Mandalay.	
May and June	Western Australia	
" 9 -	Auckland, N.Z. (North Island).	
June and July	Azores (?). Rodriguez.	
" " -	St. Louis (Senegal).	
" -	Iceland.	
August -	Jamaica (troops at hill station).	
" -	St. Helena.	
" -	Mauritius.	
September	Yünnan (China). Seychelles (?). Réunion.	
October -	Shiré Highlands (Central Africa).	
November	Shoah (Abyssinia).	
December -	Gilgit (Kashmir).	
1891.		
End February and March.	Recurrence in Yorkshire, Norway, and United States.	

General Conclusions.

From the summary which has been given of the progress of the Influenza epidemic abroad, the following conclusions seem deducible:—

1. That the general course of the epidemic in the northern hemisphere has been from east to west, (*i.e.*, in a direction contrary to

General conclusions.

the prevailing surface winds,) and from north to south. In the southern hemisphere its course has been from south to north.

2. That it would appear to have followed on the whole the lines of human intercourse, the capitals and important cities in each country being attacked before the provincial towns and rural districts.

(In reference to this, however, it has to be observed that earlier and more complete information comes to hand from important centres than from outlying places, so that it may be contended that the earlier incidence upon the chief towns is more apparent than real. In this country, however, where more complete information is available, London has been attacked before the provincial towns, and, as a rule, the market town of a district before the country villages, and the same seems to have been the case in other countries where careful inquiries have been made, *e.g.*, in Hesse, New South Wales, and Massachusetts.)

3. That the epidemic has not travelled faster than human beings, parcels, or letters could travel.

(Dr. Clemow considers that the progress of the epidemic in Russia is opposed to this view, it having, in the space of little more than a fortnight, traversed some 3,000 miles from Tomsk to St. Petersburg, across barren and sparsely inhabited steppes. It is not, however, proved that the epidemic originated at Tomsk, and was conveyed thence to St. Petersburg; both places may have been infected from a third place, from which the infection reached Tomsk sooner than it did St. Petersburg.)

The outbreak in Jamaica reported by Dr. Phillips, apparently concurrent with that at St. Petersburg, if really Influenza, is also difficult of explanation. It will be noticed that, writing on December 17th, he speaks of the disease as being also prevalent in America, whereas it was only on that day that the first cases in New York were reported. Information received through the Colonial Office attributes it to introduction from Europe by personal agency.)

4. That the disease has prevailed independently of season, climate, and weather. As in former epidemics it has prevailed nearly at the same time at places in the north and south hemispheres, *i.e.*, in opposite seasons of the year. It has prevailed in the cold of Russia and the heat of India; in the moist climate of the British Isles, and the dry air of Egypt. In Spain its advent was preceded by a month of cold dry frosty weather, and at New York by the mildest and moistest season on record.
5. That the epidemic at its commencement has in most cases been recorded to have been preceded for a few days or weeks by a succession of scattered cases; the number rapidly multiplying into an epidemic. No unquestionable instance is recorded of the epidemic having commenced suddenly with a large number of simultaneous cases in a place previously free from the disease.
6. That the cases at the commencement of an epidemic have often been described as mild. Indeed in several places the announcement of the existence of epidemic Influenza has at first been officially denied, it being asserted that nothing was present beyond the coughs and colds usual at the season of the year, though its existence has afterwards had to be admitted. Later on, however, the cases have manifested themselves more severe, and relapses and dangerous complications have occurred. The mortality during the prevalence of the epidemic has been largely

in excess of the average, being swollen not only by the deaths directly attributed to Influenza, but also by a great increase in those from other diseases, especially of the lungs and heart.

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(Possibly the announcement at first of the mild nature of the epidemic, as well as the official denial, may have been in part due to the desire to allay public alarm.)

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7. That the progress of the epidemic over the globe, taking Russia as its starting point, has been more rapid than that of previous epidemics.

(The last great pandemic, that of 1847-8, according to Hirsch, attacked Russia in February and March 1847, Turkey in August, France September to December, Denmark in October and November, Germany October to January 1848, Italy December and January, London in November (the chief mortality in London being in 1847, in the remainder of England and Wales in 1848), the north of Scotland in December, and Hawaii in January.)

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CHAP. III.
Clinical features.

Identity with
former epidemic
of Influenza.

Catarrhal symp-
toms not essen-
tial feature.

III.—CLINICAL HISTORY.

Few persons who have read the history of the previous epidemics of Influenza, and compared it with that of the epidemic of 1889-90, can doubt that the disease with which we have been visited is the same as that which has prevailed so extensively in former periods, as described in the pages of Dr. Theophilus Thompson and others, and which being ascribed, in the absence of any other known cause, to the influence of the stars, received (it is said first in the 17th century) the Italian name of "Influenza."

In its epidemiological features, the geographical course taken by the disease, its rapid propagation, quick development as an epidemic, and almost general incidence both as regards localities and individuals; in its clinical features, the sudden onset, rapid development of fever, and great and enduring nervous prostration out of all proportion to the severity of the other general or local symptoms, the small mortality from the disease as a direct cause of death, but the liability to relapses and dangerous pulmonary sequelæ, have all been the same as in former epidemics of Influenza.

The chief clinical difference between the disease as observed now and on former occasions has been that catarrhal symptoms have been less prominent in the recent than in many former epidemics and more particularly in that of 1847-8 as described by Dr. Peacock. In the late epidemic coryza has been commonly absent or only developed late in the case; the most common and urgent symptoms being the frontal headache and pain in the eyeballs, muscular pains in various parts of the body, and nervous depression. It is not necessary to suppose that this difference was due to a difference of nature or quality in the exciting cause of the disease on this and on previous occasions. It may be attributable to differences of temperament or of habits of life on the part of those attacked, or possibly to the fact that at the time when the recent epidemic was at its height in London and a large part of England, the weather was mild with fresh westerly breezes, and there was an absence of frost and fog, which had they been present might have thrown the stress of the disease more upon the respiratory organs.

This comparative absence of catarrh, although it led some observers to doubt whether the recent epidemic has been one of true Influenza, has been observed on previous occasions. Dr. Gairdner,* writing of Influenza in 1862 says, "But although catarrh is frequent and may be severe, the disease (*i.e.*, Influenza) is essentially a fever and not a catarrh. Nay, the catarrh may be absent or insignificant; not unfrequently it is so."

Dr. Wilks also, writing of the epidemic of 1847, says,† "although a synonym for Influenza is 'epidemic catarrh' the latter was by no means a constant symptom; many of the worst cases, and especially the fatal ones, having no catarrhal symptoms whatever."

The occasional absence of catarrh was indeed noticed so long back as 1782. In the "Transactions of the Royal College of Physicians" it is recorded, "The symptom which universally prevailed, and which appeared to be almost a pathognomonic of the disease, was a distressing pain and sense of a constriction in the forehead, temples, and sometimes in the

* "Clinical Medicine," p. 100.

† "Universal Review," Jan. 15, 1890.

“ whole face, accompanied with a sense of soreness about the cheek bones under the muscles. This now and then was felt previously to the catarrh, and not unfrequently was followed by very little or no catarrhus affection.”

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Another circumstance which made some practitioners hesitate to call the disease “Influenza,” is the habit which has unfortunately obtained, especially in popular speech, of applying the name of “influenza” to cases of severe febrile catarrh, such as are met with more or less frequently every year. The name “Influenza,” however, belongs historically and etymologically to the epidemic disease, to which it will be applied throughout this report, and the term has no appropriateness as applied to cases of ordinary catarrh, however severe. The disease recently epidemic has, for the sake of distinction, been frequently spoken of as “Russian Influenza,” on account of the European invasion having commenced in that country. It has also been spoken of under the name of “epidemic catarrh,” and by its French name of “La grippe.”

Name “influenza” improperly used for severe catarrh.

Some medical men have looked upon the recent disease as of a malarial nature, and as resembling certain forms of tropical fevers; and it has even been attempted to trace its origin to the great inundations of the Hoang Ho and other rivers in China, which took place in the year 1888, it being supposed that the fine mud left by the rivers was carried up in a dry state by the winds, and diffused over the globe through the atmosphere. Such a dissemination is, however, opposed to all that is known of the behaviour of malarious fevers.

Supposed malarial nature of epidemic Influenza.

Another view which found some favour at the commencement of the epidemic was that which regarded the disease as identical with the “dengué,” “dandy fever,” or “break-bone fever,” of tropical climates. This disease, as described, seems to resemble Influenza in its rapid diffusion and development as an epidemic, in its sudden invasion and rapid establishment of high fever, in the frontal headache, pain in the eyeballs, severe pains in various parts, or all over the body, in the tendency to relapses, and great prostration, yet with little mortality. Dr. Domenichetti, Medical Officer of Health for Louth, but formerly Port Medical Officer for Gibraltar, describes the symptoms of dengué as it prevailed there in 1867, as follows:—“Pain in the limbs, rigors, headache, and pains in the eyeballs, foul tongue, and occasionally vomiting or diarrhœa. On the subsidence of the febrile symptoms a rash resembling measles covering the body and especially the arms and backs of the hands. The occurrence of the rash is not invariably, indeed it may be of infrequent occurrence.” Dr. Stokes, civil surgeon of Gibraltar, stated that in his cases the disease presented the symptoms of bilious or gastric fever with severe pain in the eyeballs, back, and limbs, particularly in the loins, with great prostration. On the third or fourth days of fever a rash appeared on the surface of the body, and when the rash did not present itself the patient usually had severe bilious diarrhœa, frequently with discharges of blood from the bowel and other hæmorrhages. Great weakness followed, and convalescence was slow. The disease prevailed from September 10th to November 30th, 1867, attacking four fifths of the civil population. Many persons suffered two or more attacks (? relapses), but it proved fatal in only two cases. It was decidedly infectious; the first cases noted in the city were persons who had arrived a few days previously in a steamer from Cadiz where the disease was then prevalent. The popular name for the disease was “trancazo,”—a blow with a stick,—it was also sometimes called “knock-me-down fever” from its sudden outset.

Similarity to dengué.

Dr. Domenichetti says that the pyrexia only lasted a few days; the incubation period was two to four days, and he notes the close similarity

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Differences

according to
Dr. Limarkis

of the symptoms of the Influenza, which has recently prevailed in Lincolnshire to those of the dengué which he observed at Gibraltar. Dengué, however, is a disease of warm climates and of hot seasons of the year (though its northern range has of late years been extending, and it was, as before mentioned, prevalent in the Mediterranean region in the late summer and autumn of 1889). It is not likely, therefore, that it should develop into an epidemic in the northern countries of Europe during the winter months, however mild the season.* Dengué seems also to differ from Influenza in the site of the pains in the limbs, which are in the joints, whereas those of Influenza are rather in the muscles; in the constant presence of a rash, only very occasionally met with in Influenza; and in the absence of the tendency to subsequent inflammations of the respiratory organs, so common in Influenza, and in which the chief danger of the latter disease resides.

Dr. Limarkis, who, living in Constantinople, has had ample opportunities of seeing both diseases, gives a series of differential symptoms. These, arranged in tabular form, are as follows:—

	Dengué.	Influenza.
Localisation	Hot countries	All climates.
Duration of an epidemic	Three to five months	About one and a half months.
Spread	Slowly from small foci	Rapidly, attacking large districts simultaneously.
Commencement of the disease.	Always sudden	Almost always sudden.
Fever	Always very high	Not always very high.
Nervous system	Prostration, pain in the head and limbs.	The same.
Larynx and trachea	Seldom attacked	Always attacked.
Dyspnœa	Never	Common.
Gastric symptoms	Always; violent, persistent	May be absent.
Eruption	Always; beginning in the face, descending, erythematous, ending in desquamation.	Rare, irregular.
Headache	Sensation of external pressure; iron hoop.	Violent, internal, often neuralgic pain.
Complications	Rare; of heart, liver, and kidneys.	Common; bronchioles and lungs.
Convalescence	Very slow	Usually rapid.
Prognosis	Always favourable	Often occurs in malignant form.
Attacking animals	Dogs, cats	Horses.

Still further proof that Influenza is not a form of dengué modified by climate is the fact that the former occurs in hot countries in exactly the same form as in Northern Europe, and that the two diseases appeared in Constantinople, the one shortly after the other.

Dr. H. M. Sandwith, in the "Lancet" of July 5th, 1890, makes a comparison between the Influenza which prevailed in Egypt in the first three months of 1890, and the dengué which occurred there in the autumn of 1887; of which the following is a summary.

Geographical distribution.—Dengué has a well-known preference for sea coasts or for the valleys of large rivers. If we disregard a few

* Dr. Ringwood of Kells, county Meath, Ireland, states (Royal Academy of Medicine in Ireland, February 28th, 1890) that dengué has been endemic in the neighbourhood of Kells for the last five years, the disease having first appeared soon after the return of troops from Egypt in 1885.

and Dr. Sand-
with.

doubtful cases in Europe last winter, said to have been directly transmitted from Constantinople or the Piræus, it has never been heard of farther north than latitude 41° N., or than Philadelphia, Athens, Constantinople, and the south of Spain. Influenza spreads not only over a whole country without special affection for the sea coast, but is generally diffused over wide tracts, and indeed over the greater part of the inhabited world; it may reach as far north as Iceland.

Season of year.—Dengué in Egypt has always (13 times) begun in August or September, and disappeared about December, when cool weather set in.

Of 125 distinct recorded epidemics of Influenza 50 began in the winter, 35 in the spring, 24 in the autumn, and only 16 in the summer. Dengué prefers damp heat, Influenza seems specially to love damp cold, though when once started it travels irrespective of climate and season.

Sex, age, and race.—The two diseases are alike in not respecting any variety of human being, but they are both more merciful to young children than they are to adults. Dengué does not treat old persons with special severity, but Influenza depends largely upon old patients for its chest complications and subsequent mortality.

The per-centage attacked by dengué in a mixed population has often been 75 to 80 per cent. During the late Influenza epidemic the inhabitants of St. Petersburg suffered at the rate of about 66, of Berlin of about 33, and of London possibly about 20 per cent.

Contagion.—Influenza, like dengué, appears to attain its widest diffusion where the population is densest. They are both found to break out directly after sick persons from an infected country have reached places previously free from the epidemic, and seem to spread from the first patients to the members of the family, and to the doctors who come into direct contact with the sick. The sudden and simultaneous appearance of the fever over a great area of population is in both the diseases an argument against communicability, or direct contagion from one person to another. In both diseases success seems to attend the efforts of those who keep rigorously out of sick chambers and contact with the sick.

Immunity from subsequent attacks, relapses, &c.—A second attack during the epidemic is possible in both dengué and Influenza. Distinct relapses are common in dengué and rare in Influenza, for it is hardly fair to count as a relapse the bronchitis which seems rather a sequela or complication of the original fever. Dengué confers no immunity against Influenza.

Lower animals are affected by both diseases. Dengué attacks dogs, cats, sheep, and cows; Influenza, horses, dogs, and cats.

The duration of the epidemic in each disease is about three months, perhaps rather longer in dengué.

Incubation is about four days in dengué, less in Influenza.

Commencement of the attack is very sudden in both, with shivering, giddiness, and perhaps vomiting, but more distinct pain in dengué. Headache and general malaise are present in both, as in all fevers.

Physiognomy.—Dr. Sandwith has not seen in Influenza the marked flushing of face and other parts which is present in dengué. The conjunctivæ are liable to be mildly injected in both disorders.

Eruptions in dengué is probably present nearly always, though in many cases so slight and so fleeting that it is not noticed. It is sometimes so copious as to be mistaken for scarlet fever. In Influenza a rash has been seldom seen, and when present has apparently been very slight and irregular.

Desquamation in dengue may last three or four weeks, and great flakes may be shed from the hands and feet. No such peeling has been reported in Influenza.

The temperature and pulse are similar in the two fevers, but in dengué the pulse does not rise with the temperature, often remaining between 68 and 90. The febrile period lasts longer in dengué, and the temperature is apt to rise a little higher than in Influenza.

Symptoms.—A coated tongue and loathing for food are more noticeable in dengué, and last several days longer than in Influenza. Constipation is equally present, and the spleen unaffected in both. Vomiting is more common in dengué. Headache is bad in both, but more neuralgic in Influenza. Giddiness during invasion and convalescence is felt in both. Pains in muscles, bones, and joints are more severe and persistent in dengue. Delirium and sleeplessness occur in both, chiefly in dengué. Sore throat is very common in dengué, the fauces and tonsils being red and inflamed, whereas in Influenza it is rather the larynx and trachea which are affected.

Varieties.—Of both diseases the prevailing symptoms in one epidemic differ from those in another.

Convalescence is very slow in dengué, rapid (at least in the East) in Influenza.

Complications are rare in dengué, while in Influenza they constitute the chief danger. Bronchitis, pneumonia, and pleurisy, common in Influenza, are absent in dengué, in which it is rather the heart, liver, and kidneys which are affected.

Prognosis is always favourable in dengué; in Influenza it may be unfavourable in aged, weak-lunged, or neglectful patients.

Treatment.—No specific for the cure or prevention of either disease has proved reliable. Rest in bed is the most important matter.

Clinical descrip-
tion—

by Dr. Bruce
Low;

As my opportunities for observing the clinical features of epidemic Influenza have been limited, I shall prefer to avail myself of the descriptions of others who have had a larger experience of it.

The following description of the clinical characters of the disease is given by my colleague, Dr. Bruce Low, mostly from observation of patients at St. Thomas's Hospital in January 1890.

“The invasion is sudden; the patients can generally tell the time when they developed the disease: *e.g.*, acute pains in the back and loins came on suddenly while they were at work, or walking in the street, or in the case of a medical student while playing cards, rendering him unable to continue the game. A workman wheeling a barrow had to put it down and leave it; and an omnibus driver was unable to pull up his horses. This sudden onset is often accompanied with vertigo and nausea, and sometimes actual vomiting of bilious matter. There are pains in the limbs and general sense of aching all over; frontal headache of special severity; pains in the eyeballs, increased by the slightest movement of the eyes; shivering; general feeling of misery and weakness, and great depression of spirits, many patients, both men and women, giving way to weeping; nervous restlessness; inability to sleep, and occasionally delirium. In some cases catarrhal symptoms develop, such as running at the eyes, which are sometimes injected on the second day; sneezing, and sore throat; and epistaxis, swelling of the parotid and submaxillary glands, tonsillitis, and spitting of bright blood from the pharynx may occur. There is a hard dry cough of a paroxysmal kind, worst at night. There is often tenderness of the spleen which is almost always found enlarged, and this persists after the acute symptoms have passed.

“The temperature is high at the onset of the disease. In the first 24 hours its range is from 100° F. in mild cases to 105° in severe ones. In one instance a medical man took his own temperature as soon as he felt ill, *i.e.*, when the shivering came on; it was then 101°·5 F., but six hours later it had risen to 103° F. In some mild cases the temperature is normal on the second day, but the usual duration of the acute symptoms is from two to four days. The temperature often sinks to sub-normal for some days after the acute stage is over.

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“Herpetic patches on the lips are not uncommon. A rash, not unlike that of German measles, was seen in some cases, principally on the posterior aspect of the limbs; there being none on the face or chest. It was seen in some cases where no drugs had been given. Profuse perspiration often occurs when the disease is passing off.”

The following clinical description is taken from a report by Dr. J. S. Bristowe to the Camberwell Vestry, dated January 8th, 1890:—

by Dr. J. S.
Bristowe;

The chief symptoms of Influenza are:—Coldness along the back with shivering which may continue off and on for two or three days; severe pains in the head and eyes, often with tenderness in the eyes, and pain in moving them; pains in the ears; pains in the small of the back; pains in the limbs, for the most part in the fleshy portions, but also in the bones and joints, and even in the fingers and toes; and febrile temperature, which may in the early period rise to 104° or 105° F. At the same time the patient feels excessively ill and prostrate, is apt to suffer from nausea or sickness and diarrhoea, and is for the most part restless, though often (and especially in the case of children and those advanced in age) drowsy. The above symptoms are not always all present, and do not always come on in the same order. Thus, sometimes the feverishness and shivering appear first, sometimes the pain in the forehead, sometimes that in the eyes, sometimes that in the limbs, sometimes diarrhoea. In ordinary mild cases the above symptoms are the only important ones which present themselves, and the patient may recover in the course of three or four days. He may even have it so mildly that, although feeling very ill, he is able to go about his ordinary work. In some cases the patients have additionally some dryness or soreness of throat, or some stuffiness and discharge from the nose, which may be accompanied by slight bleeding. And in some cases, for the most part in the course of a few days, and at a time when the patient seems to be convalescent, he begins to suffer from wheezing in the chest, cough, and perhaps a little shortness of breath, and before long spits mucus in which are contained pellets streaked or tinged with blood. This complication of congestion of the lungs, broncho-pneumonia, aggravates the patient's malady, prolongs the period of suffering, and sometimes causes very severe illness, and even death. Another complication is diarrhoea. Another is a roseolous spotty rash, either resembling scarlet fever or urticaria, about the elbow, forearms, and fingers, knees, legs, and feet, and even on the trunk. This is probably unimportant. Further, it may be remarked that although the uncomplicated disorder usually does not last more than two or three days, occasionally a relapse or recurrence of the malady takes place at the end of a week or so. Influenza is by no means necessarily attended with the catarrhal symptoms which the general public have been taught to regard as its distinctive signs, and in a very large proportion of cases no catarrhal condition whatever becomes developed at any time.

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by Dr. Cowan.

The following synopsis of symptoms is given by Dr. Cowan, medical officer to the Pentonville Prison, in a report for which I am indebted to Dr. Gover, of the Home Office:—

Period of incubation from one to seven days. The fact of the men who leave their food being immediately reported to the surgeon brings the cases under notice at a very early stage of the disease.

Symptoms are marked and easy to diagnose, though in cases where there is no rise of temperature the illness might be feigned.

General aspect.—The patient looks ill and has a dull drowsy appearance.

Prostration.—Very marked, and a general desire to go to bed.

Loss of appetite.—Very marked dislike for nearly all solids and liquids, lasting about three days.

Headache.—Very severe, commencing at back of neck, and settling down into a severe frontal headache with post-orbital pains.

Tongue.—In the more severe cases coated at root and centre; sides very red and dry. In the mild cases it is of a general dirty look, and not characteristic.

Temperature averages 101° F., which only lasts about 24 hours, and then falls to 99° or normal. The highest temperature was 104° in a lad of 19, and this continued for three days, falling slightly of an evening.

General febrile symptoms are present in a slight degree.

Pain.—Especially in head, back, and thighs.

Sore throat noticed in a few cases.

Diarrhœa in a few cases.

Complications.—Bronchitis with pain over sternum, but very little sputum. A dry hacking irritable cough, lasting about five days.

Dr. Farbstein ("Lancet," March 1st, 1890) regards the concurrence of a high temperature with a comparatively slow pulse (not above 88) as diagnostic of Influenza (but see page 313).

Frequency of
different
symptoms ac-
cording to—

Drs. Robertson
and Elkins.

The following table shows the frequency of different symptoms in 70 cases observed by Drs. Robertson and Elkins at the Morningside Asylum, Edinburgh (British Medical Journal, February 1st, 1890).

Great weakness after attack occurred in	-	92·8	per cent.
Frontal headache	-	88·6	"
Pains in the limbs, &c.	-	84·3	"
Giddiness	-	81·4	"
Loss of appetite	-	78·6	"
Pain in lumbar region	-	77·1	"
Coryza	-	77·1	"
Slight bronchitis	-	77·1	"
Suffusion of eyes	-	71·4	"
Rigor	-	71·4	"
Nausea	-	62·9	"
Unpleasant dreams, "wandering"	-	58·6	"
Flatulence	-	40·0	"
Vomiting	-	38·6	"
Constipation	-	37·1	"
Diarrhœa	-	25·7	"

The 70 patients were all adults, 38 being males and 32 females.

Dr. H. C.
Bristowe;

The following per-centage frequency of symptoms is given by Dr. H. C. Bristowe, ("British Medical Journal," February 22nd, 1890,) as

based upon 177 cases observed in King Edward's School for Girls, Southwark, 175 of the patients being girls of 11 to 16 years of age, and two mistresses :—

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Symptoms.	Cases.	Per cent.
Headache - - - - -	175	98·3
Back-ache - - - - -	25	14·1
Side-ache - - - - -	27	15·2
Chest pain - - - - -	6	3·3
Stomach pain - - - - -	13	7·3
Leg-ache - - - - -	29	16·4
Arm-ache - - - - -	2	1·1
Total pain - - - - -	176	99·4
Watery eyes - - - - -	170	96·0
Sick - - - - -	61	34·5
Bowels normal - - - - -	127	71·7
„ confined - - - - -	19	10·7
Diarrhœa - - - - -	21	11·8
Tongue normal - - - - -	19	10·7
„ furred - - - - -	73	41·2
„ pale and flabby - - - - -	78	44·0
Rash, herpes labialis - - - - -	17	9·6
„ erythema - - - - -	9	5·8
„ papular - - - - -	36	20·3
Lungs, cough - - - - -	72	40·7
„ bronchitis - - - - -	9	5·1
„ pneumonia - - - - -	3	1·7
Sore throat - - - - -	5	2·8
Epistaxis - - - - -	4	2·3
Drowsiness - - - - -	9	5·1
Pale face - - - - -	34	19·7
Flushed face - - - - -	143	80·8
Shivering - - - - -	4	2·3

Mr. George Preston (British Medical Journal, March 1st, 1890) Mr. G. Preston gives the following as the relative frequency of different symptoms in

85 cases among boys of ages ranging from 12 to 16 years on board the industrial training ship "Mount Edgcombe," at Saltash :—

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Symptoms.	Cases.	Per cent.
Frontal headache only - - - - -	49	57·7
Pain in head and legs - - - - -	3	3·5
Pain in head and back - - - - -	17	20·0
Pain in head, back, and limbs - - - - -	6	7·1
Pain in head and chest - - - - -	7	8·2
Pain in head and epigastrium - - - - -	3	3·5
Papular rash - - - - -	2	2·3
Herpes labialis - - - - -	4	4·7
Sickness at onset - - - - -	3	3·5
Sore throat - - - - -	5	5·9
Cough - - - - -	10	11·8
Eyes suffused - - - - -	14	16·5
Running from nose - - - - -	7	8·2
Relapses - - - - -	3	3·5
Complications (catarrhal pneumonia) - - - - -	1	1·2

The temperature ranged from 99· — 99·5° F. in 21 cases.

"	"	99·5—100·5° F.	16	"
"	"	100·5—101·5° F.	23	"
"	"	101·5—102·5° F.	17	"
"	"	102·3—103·5° F.	8	"

Pain, though present in every case, was in all but five very mild as compared with its severity in adults.

The following interesting observations and speculations respecting the pathology of Influenza are made by Dr. Bezly Thorne :—

" With reference to the manner in which epidemic Influenza invades the system, I would beg to point out that, among the great variety of objective symptoms which that malady presents, there is one which is universally and primarily present, namely, capillary congestion of the conjunctiva. The rosy hue which is exhibited by this condition has been observed by me as many as eight hours before the onset of either chills or frontal pain, and must have been in process of development for at least some few hours before. I take it, therefore, that it is not only the most constant objective symptom of the disease, but that it is also the primary one, and I would go so far as to suggest that the circumstances to which I have alluded suggest that the conjunctiva is the structure which the infecting material, microbe or not, most generally if not always attacks.

" When it is borne in mind that the incidence and features of individual accesses of Influenza are influenced in a very remarkable degree by predisposing causes, I think that the theory which I have stated is in some measure confirmed by the fact that those first and chiefly affected in an

epidemic of Influenza are those whose avocations would tend to maintain an irritable or congested state of the conjunctiva, namely, omnibus drivers, letter carriers, and sorters. Also it has been reported from St. George's and other hospitals that the comparatively strong and healthy nurses have suffered in greater proportion than patients in the wards. It is obvious that the eyes would be brought into use and exposed to changes of temperature much less in the case of persons confined to a ward than in that of the actively employed nursing staff, and it would appear that the condition of the conjunctiva is calculated to exercise a greater influence on the incidence of the disease than a condition of general ill-health.

" Since my attention has been directed to the condition of the spine in Influenza, I have observed that some spinal tenderness occurs in about two thirds of the cases, and that it is more frequently a symptom, and more severe in women than in men. In women, especially those who suffer from uterine derangement, or are passing through the climateric period, it may last for months, and I have now under observation cases that date from December last. The parts mainly affected are the cervical and dorsal enlargements, and the cauda equina. I have found the cauda equina sensitive to deep percussion in a strong and previously very healthy young man within three hours of the onset of pyrexia. The dorsal region is generally the first to improve in cases in which all are affected, and the last may be either the cervical or sacral. Percussion of either region may produce vertigo and nausea, but the part most intimately connected with the production of these phenomena is that which lies beneath the fifth cervical vertebra. In three cases, each that of a woman, a sensation described as unendurable agony, but not pain in the ordinary acceptation of the word, has been induced, in two cases by the vibrations of a carriage, in the third by the sound of the sweeping of a carpet. In the last-mentioned case, and one of the two others, syncope was impending when the offending condition was removed; in the third the subject could not readily escape from the sensation as it arose in the course of a railway journey, and had to exercise the greatest self control to avoid jumping from the carriage window at the risk of life.

" The long enduring evil effects of an access of Influenza in a large proportion of cases suggests that the *materies morbi* is only slowly extinguished in or eliminated from the system. Some subjects experience a weekly attack or relapse for many weeks after the primary access. It may take the form of great impairment of mental and physical power, or the more definite shape of vertigo or cardiac depression with general arterial relaxation necessitating recourse to the recumbent position. In confirmation of this view I would state that the second cases of primary Influenza which have come under my observation have been preceded by what would otherwise be regarded as a complication. Some 12 to 24 hours before the occurrence of ocular congestion and orbital pain there has been an intense coryza or tonsillar inflammation accompanied by ulceration or follicular suppuration. This sequence of events suggests to my mind that in these cases a poison latent in the system has been called into activity by the debility induced by an accidental and independent malady of a more or less catarrhal nature.

" Briefly, I believe that Influenza is an infectious and febrile affection of the cerebro-spinal nerve-centres: that the *materies morbi* enters the system through the conjunctiva, in which structure it probably incubates its infecting brood, and thence passes through the tissues of the eye and optic nerve into the encephalon and the spinal cord; that the overflow of the tears carries the infection through the nasal duct into the nares, which may or may not pass into a state of acute catarrh according to the state of health in which they may happen to be at the time; that, from the nares, infecting material passes from the post-nasal region into both the œsophagus and larynx, and that affections of the respiratory or gastro-intestinal systems may ensue, or not, according to whether they present the conditions which are favourable to the development of acute catarrhal affections.

" The various other phenomena of the disease, too numerous to be mentioned in detail, are of such a nature as might be anticipated if Influenza only be regarded as a cerebro-spinal affection."

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Varieties.

By many observers three forms of Influenza have been recognized, viz. :—

- A. Nervous,—the prevalent form in the epidemic of 1889-90, characterized by great depression and severe pains in the head, spinal region, and muscles.*
- B. Catarrhal,—marked by coryza and tendency to congestion of the respiratory mucous tract.
- C. Gastric,—especially noticed in children, and marked by vomiting, diarrhoea, and other symptoms of gastro-intestinal disturbance.

These three forms have all been observed in cases occurring together under the same roof, and are evidently mere varieties of the same disease.

Similar varieties have been recorded in previous epidemics. Dr. Peacock in 1847 recognised three forms, which he called :—

1. Simple catarrhal fever.
2. Catarrhal fever with pulmonary complication.
3. Catarrhal fever with predominant disorder of the abdominal organs.

Of the first form the most prominent symptoms were distressing headache, particularly in the forehead across one or both eyebrows, and in the balls of the eyes, and general feeling of soreness and dull aching pains in the chest, back, and limbs. The pulse was little increased in frequency, being 80-90, rarely over 100.

Possibly these varieties may depend upon the route by which the materies morbi gains access to the human body: in the first form the invasion taking place, if Dr. Bezly Thorne's suggestion be correct, by way of the conjunctiva, and thence by a short route to the nervous system; in the second by way of the respiratory mucous membrane through inhalation; and in the third the poison being swallowed, and entering the body from the digestive tract.

The incubation period (*i.e.*, the period which elapses between the reception of the poison into the system and the manifestation of symptoms) in Influenza is undoubtedly a short one. Indeed some medical men doubt whether there is any incubation period, and consider from the suddenness of the onset of the disease that the poison is taken into the system in a condition and dose such as to produce immediate effects. This appears to be the general opinion in Ireland. The suddenness of onset of a disease, and the absence of premonitory symptoms, do not necessarily imply the absence of an incubation period. Scarlet fever commences suddenly, but not until after an interval of usually three to five days from exposure to infection. It is obvious that the question whether there be an incubation period or not will depend upon what the nature of the cause may be; if it be a chemical poison produced outside the body it may be expected to produce its effects almost immediately, or as soon as a sufficient dose has been absorbed; if it be a contagium vivum, which multiplies within the body, then a certain time (varying perhaps in length according to the number of germs originally received, and the suitability of the patient's body as a soil for their growth) must elapse before it has reproduced itself sufficiently to produce constitutional effects.

In a table given as an addendum to this report are the observations by a number of medical men, medical officers of health, and others, as

* Some distinguish a rheumatic form characterized especially by pains in the muscles and joints.

Incubation
period short.

to the length of the incubation period (dating from exposure to infection to the commencement of illness), or as to the interval between the first case and the next in invaded houses.

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It will be observed that not a few speak of two or more cases occurring simultaneously in the same house. In such cases the disease must evidently have been contracted by the several persons from a common source and not from one another. Seeing also that the length of the incubation period must probably vary somewhat in different persons, it is difficult to be sure that in the cases where a very short interval (*e.g.*, 24 hours, or under) occurred between one case in a house and the next, both cases may not have contracted the disease from the same source, and not the second from the first.

The most satisfactory instances for determining the length of the incubation period of Influenza are—

Data for de-
termining it.

- (a.) Instances in which a person has been taken ill a known time after arriving in an infected locality from one previously uninfected. I find few such instances recorded: in one of them the visitor was taken ill in 16 hours, and in another 5 days, from his arrival in the infected place, the remainder being between these limits.
- (b.) Instances in which the arrival of a person suffering from Influenza in a locality previously free from it has been followed by other cases of the disease among persons in contact with the patient.* There are many such cases recorded, and the most frequent interval between the arrival of the patient and the occurrence of the secondary cases has been 2 or 3 days, sometimes under 2 days; and in a few cases as long as 7 days. In one case reported by the late Dr. Fernie, of Stone, a girl from London arrived at a convent school scarcely convalescent from Influenza; no other cases occurred till the ninth day, when 14 cases occurred, 11 of these being scholars, and 3 nuns, who taught them. 18 other cases occurred during the course of the next fortnight among the other nuns, who never go outside the convent walls. There were only 4 other school-girls, and these escaped. The interval of 8 days is exceptional, and would appear to point to some intermediate unrecognised case, or to the development of infection in the house, the conditions necessary for such development not immediately coming into operation.
- (c.) Instances of Influenza being contracted after a single definite exposure to infection, *e.g.*, after visiting a patient already suffering. A good many such cases are recorded, and the usual interval has been 2 or 3 days. In one case a medical man states that he was taken with a rigor the commencement of an attack of Influenza an hour after visiting his first case of that disease. The difficulty in a disease so widely prevalent as Influenza is to be sure that the known exposure is the only occasion on which the patient could have contracted the disease.

The interval between the attacks of the first patient and the next succeeding one in the same house is a less satisfactory criterion, for on the one hand where the interval is short both patients may have

* Dr. Squire says: "Influenza has sometimes seemed to follow from the reception of a visitor from an infected district. When introduced in this way an interval of four days may occur, but visitors to an infected locality are often quickly seized."

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contracted the disease from the same source, and this is the more probable if the locality be one already infected; and on the other hand infection may not be communicated by the first patient, or received by the second, immediately on the former becoming ill.

The usual interval between the first and second cases in invaded houses is given by the majority of observers as from 24 hours to 4 or 5 days, most frequently 2 or 3 days.

The intervals between the second and later cases are obviously of little significance unless the circumstances of association of the patients are known. One medical man gives the intervals of attack as 12 to 18 hours among persons sharing the same room or bed, and longer, 1 to 7 days, where contact was not so close.

One or two medical men express the opinion that the incubation period is shorter in children than in adults.

Duration of
infection.

The infectiousness of the patient is proved by many instances to continue into the stage of convalescence, but I am unable, from the information which has come before me, to fix the limit of its duration. Two observers state that it continues at least as late as the 8th day (pp. 302 and 308).

It has been suggested by a German observer that the patient may be capable of communicating infection, while as yet only in the stage of incubation. If so, this would help to explain the rapid spread of the disease and the shortness of the interval in some cases between the attacks of different members of one family. I have, however, come across no evidence in favour of this view, and the account given me by Mr. Wilson, of Kenninghall, on p. 315 of this report may be considered in this connexion.

Susceptibility
varies in
different persons

Although a degree of susceptibility to Influenza is possessed by a large proportion of individuals, as shown by the large per-centage attacked under favouring circumstances,—*e.g.*, in some institutions 75 per cent.,—yet all are not equally susceptible, and of a number of persons placed under circumstances the most favourable for contracting it, some always escape. Some medical men have thought that susceptibility, or the reverse, runs in families, noticing that in an invaded household blood relations have been attacked, while visitors and servants have escaped, or *vice versâ*. It is probable also that in the same individual susceptibility may vary from time to time, and this will help to explain the irregularity observed in the intervals between primary and succeeding attacks in different households. Fatigue and exposure to changes of temperature favour the development of the disease, while rest in bed has an opposite tendency. Thus in hospitals and lunatic asylums the nurses and attendants suffered much more severely than the patients, and few bedridden patients were affected. In other institutions in which the inmates and staff are more on a par as regards the labour required of them, the proportion of cases was more nearly equal, or the inmates suffered the most numerously.

and under
different con-
ditions.

It has been observed in some districts that men exposed to heat while at work (*e.g.*, steel makers, cement burners, &c.) have been specially affected, and in two woollen factories at Wellington, Somerset, it was observed that the highest proportion of cases was among the workers in the weaving rooms, which were maintained at a temperature of 60° F. Probably, however, in order to maintain this temperature in January, less ventilation would be allowed than in other rooms. On the locomotive and waggon works of the London and North-Western Railway forgemen and furnacemen entirely escaped, while some other groups of workpeople suffered considerably. In the Friern Barnet

district men engaged on railway works were noticed to be more liable to contract Influenza than men working elsewhere; 100 out of 300 employed being affected: they were tunnelling and liable to catch cold at their work. Here, however, the influence of confined air has to be taken into account. Indeed, no circumstance connected with work seems to have had so large an influence in conducing to a high Influenza incidence as that of a large number of persons working in association in a confined atmosphere.

Any depressing bodily conditions, such as catching cold, may very likely predispose to Influenza. In a good many districts the advent of the epidemic was said to have been preceded by a prevalence of ordinary colds. It was observed* that women were more liable to contract Influenza at the menstrual periods.

Vigorous health, however, did not prevent persons from contracting Influenza, nor from suffering severely from it if they got it. It was a matter of general observation that people who attempted to continue at work while suffering from Influenza were liable to have it very severely.

No age is exempt from Influenza. A case of supposed Influenza in a new-born infant, born while its mother was convalescent from an attack, is recorded in the "British Medical Journal," of March 1st, 1890, and another on p. 311 of this report. It was by many considered that children were not so liable to contract Influenza as adults, but the large per-centage affected in some schools and training ships negatives this view. It seems, however, generally agreed that children who contracted Influenza did not have it so severely as adults, suffering less pain and being sooner convalescent.

Some medical men stated that more males suffered than females. The proportion affected was larger among soldiers than among their wives, though the difference was not great, but in the Post Office the proportions of male and female clerks affected were almost identical.

In table A. (page 3) it will be seen that more deaths ascribed to "Influenza" occurred among females than among males, both in the epidemic years 1847-8, and generally in the earlier years of the series.

Dr. Peacock (Influenza in 1847) attributed this preponderance to the fact that Influenza was a disease especially fatal to elderly persons, and that among persons of advanced ages there were more females living than males.

One attack of Influenza does not seem to be protective against another; the disease in this respect resembling diphtheria, erysipelas, and cholera rather than small-pox, measles, or whooping cough. The duration of the epidemic in a locality is so short that it is difficult to distinguish between second attacks properly so-called, and relapses, which are frequent enough. A case is recorded in the "British Medical Journal," of February 15th, 1890, in which a patient who had suffered from Influenza in France in December 1889, had another attack in England in January 1890. It was noticed in 1837 that many persons suffered from Influenza who had had the disease during the previous epidemic in 1834. The shortness of the interval between these two epidemics as compared with that between 1848 and 1889 seems to show that the periodical return of the disease in an epidemic form does not depend upon the accumulation in the interval of susceptible individuals unprotected against the disease by a previous attack. If one attack afforded protection against another a large proportion of the population in 1837 must have been protected, yet an epidemic occurred, and on the other hand for many years before 1889 a large majority of the

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Influence of
age and sex.

One attack not
protective
against another.

* "British Medical Journal," March 1st, 1890, p. 477.

population must have been unprotected by a previous attack, yet the epidemic did not recur.

The persons now living who passed through the disease in 1847 are of course comparatively few, but such persons have not been exempt from the present epidemic.

I should be inclined to attribute the short duration of the Influenza epidemic in a locality to the establishment of a tolerance for the specific poison among the persons exposed to it, similar to the tolerance for dust possessed by workmen in rag factories as mentioned on p. 83 of this report, but which is soon lost on their ceasing to be exposed to it, rather than to a true immunity being established.*

Relapses in Influenza are of frequent occurrence; they occurred in 9.2 per cent. of the cases at the Morningside Asylum, Edinburgh, and in some cases indeed a second relapse has been recorded. The time at which the relapse occurs is usually from a week to a fortnight after the primary attack, and it can often be distinctly traced to an exposure to cold, or return to work before complete recovery. The symptoms of the relapse are similar to those of the primary attack, except that they are commonly more severe.

Of the complications of Influenza the most frequent are inflammatory conditions of the respiratory organs, as pneumonia, bronchitis, and pleurisy, and to these the mortality ascribed to it is chiefly due. Other formidable, but fortunately rare, sequelæ are meningitis, suppurative otitis, and phlebitis, causing embolism and gangrene. Hæmorrhages of various kinds also occur.

An attack of Influenza greatly tends to bring about or hasten a fatal termination if occurring in a patient who is already the subject of organic disease of the heart, phthisis pulmonalis, or pulmonary emphysema; and also, according to the statistics of Dr. Bertillon, diabetes or cerebral disease. It is also especially dangerous to persons advanced in life.

I am not aware of any observations having been made which materially advance our knowledge of the morbid anatomy of the disease; the morbid appearances found in the bodies of persons who have died from it being those of the complications by which death was more immediately brought about.

The bacteriology of Influenza cannot yet be said to be settled.

In January 1890 Dr. Jölles, of Vienna, announced that he had discovered in the sputa of Influenza patients capsulated cocci closely resembling Friedländer's pneumonia cocci in size, shape, chemical reaction, and cultivation characters.

Weichselbaum† found in the sputum of Influenza patients a pneumococcus, predominantly among numerous other kinds of bacteria. He found the same pneumo-coccus in one case in the urine, and in fatal cases in pus taken from the frontal and maxillary sinuses and the middle ear. Examination of the blood invariably yielded negative results.

Ribbert finds in the sputum of Influenza patients, in collections of pus, and also in the lung tissue, the spleen and the kidneys of fatal cases, either the streptococcus pyogenes or else the streptococcus erysipelatosus. In one case in which the lungs were unaffected the

* The recurrence of the epidemic in 1891 may be expected to give further opportunities for studying the question of the immunity conferred by one attack of the disease against another as regards both individuals and communities.

† These brief notes of bacteriological observations on Influenza are condensed from a report by Dr. J. W. Moore in the Dublin "Journal of Medical Science," May and August 1890.

Relapses
common.

Complications
and sequelæ.

Morbid anatomy.

Bacteriology.

spleen and kidneys yielded pure cultivations of the streptococcus. The diplococcus pneumoniae is also frequently demonstrable, but he considers it to be secondary in its occurrence. He looks upon the streptococcus, if not the specific germ of Influenza, as playing a very active part in the course of the disease.

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Levy finds in the sputa of Influenza patients, in pus from the ear, in pleural exudations, and in the lung in two fatal cases with pneumonia either Fränkel's diplococcus pneumoniae or the staphylococcus pyogenes albus, or both together; the diplococcus being the most frequent. He does not, however, believe that either of these micro-organisms should be regarded as the primary exciting cause of the disease, but as connected with a secondary infection for which the Influenza merely laid the foundation.

Babes found that animals inoculated with the sputum of uncomplicated Influenza cases and with the secretion from the recesses of the nostrils perished in a few days with pneumonic phenomena. He found in such secretions two kinds of very minute constricted bacteria which he provisionally names "Bacterium No. 1" and "Bacterium No. 2." These are pathogenic, causing fatal pneumonia when injected into mice.

Klebs finds in blood from the finger of Influenza patients an enormous mass of small, actively moving, highly refractile corpuscles (monads) exactly resembling those which he has found in pernicious anæmia, but the red blood corpuscles were unaltered. In the blood of a patient who had died he found, in addition, larger oval, flagellate, slow-moving forms, a number of which were present in the interior of the red blood corpuscles. He believes Influenza to be essentially a disease of the circulatory system, and that the local phenomena may be the result of minute thromboses in the different organs of the body which lowering the nutrition of the part either lead to gangrene or create a soil favourable for the growth of pathogenic organisms.

Kollmann finds in the blood of Influenza patients actively moving forms, in greater or less number, in shape oval, round, rod-like, or dumb-bell shaped. These forms, however, appear to be not different from those met with in the blood of persons in perfect health.

Dr. Prudden, of New York, found in the sputa of cases of Influenza, with or without pneumonia, the diplococcus pneumoniae, the staphylococcus pyogenes aureus, and the streptococcus pyogenes, none of which are special to Influenza.

A perusal of the conflicting statements of these different observers inclines one to think that the microbe (if there be one) which is the essential cause of epidemic Influenza has not yet been discovered, and that the forms which have been identified in the sputa of patients or the lungs of fatal cases are either accidentally present or are connected with the occurrence of secondary affections for which the attack of Influenza had prepared the soil.

IV.—ETIOLOGY.

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Etiology of
Influenza
difficult to
discover owing
to its apparently
capricious
behaviour.

Hypotheses
suggested.

The etiology of epidemic Influenza presents a difficult problem, especially owing to the apparently capricious behaviour of the disease in different times and places; or as recorded by different observers. It is hardly possible to deduce from the recorded facts of the occurrence of the disease any general statement which is not contradicted by experience elsewhere. Thus to take a circumstance hardly admitting of errors of observation, some medical practitioners have reported that the disease rarely attacks more than a single person in a household, or that if in any household more persons than one have been affected, they all have been taken ill at the same time. Other practitioners on the other hand state that in any household in which a case occurs the whole or the greater part of the members rarely fail to fall victims to it; the attacks occurring in succession at variously stated intervals.*

The hypotheses which have been or may be put forward as to the mode of propagation of the disease may be classified as follows:—

A. Atmospheric:—

1. Climatic conditions, weather.
2. Aerial poison, miasm, malaria.

B. Communicable:—

1. Direct, from person to person, or by fomites (like measles or small-pox).
2. Mediate; the poison derived from human bodies being capable of multiplying in a suitable medium outside the body (like cholera or enteric fever).

C. Evolved from some commonly present disease under unusual (?atmospheric) conditions.

D. Zoogenous:—

1. Derived from equine "influenza."
2. Carried by migratory birds.

E. Dietetic:—

Russian oats.

Atmospheric
hypothesis.

A.—The view which attributes the origin of Influenza to atmospheric conditions has been widely, if not universally, held in the past, and the advent of the recent epidemic seems to have found medical opinion in this and other countries prepossessed in its favour.

The circumstances in the behaviour of epidemic Influenza which an atmospheric cause has been especially invoked to explain are first, the rapidity of its spread from place to place; and second, its alleged commencement by a large number of simultaneous cases.

Rapidity of
spread probably
over-estimated.

1st. Concerning the rapidity with which epidemic Influenza is carried from place to place, I cannot but think that there has been a tendency to exaggeration. Thus at a discussion at the Academy of Medicine in Paris, M. Colin is reported to have said† that it travelled "with the rapidity of light or electricity." Were this so its appearance would be

* The following are examples of this conflict of statement; they might be largely multiplied (see pages 284-295):—

"In no case have I found the whole household stricken down at the same time. Generally about two days elapse before a second case occurs, and that one is generally the person acting as nurse or in close attendance on the first patient, and so on in many instances until the whole household has been affected."—D. CORBET, M.O.H., Kidderminster.

"I have not observed any interval between attacks in the same house. Where more than one member of a family have been attacked, the attacks have been fairly simultaneous."—W. G. CRESWELL, M.O.H., Saltley.

† "British Medical Journal," Jan. 4th, 1890, p. 41.

instantaneous in every part of the globe, and in that case it could hardly be carried in the air, for atmospheric currents, and even atmospheric vibrations* do not travel so fast; we should have to look for its cause in the luminiferous ether.

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In 1889-90 the epidemic, assuming it to have started from Russia in October, took about six weeks or two months to spread over Europe, and to reach North America; rather more than two months to reach the Cape; about three months to reach South America; about four months to reach India; five months to reach New Zealand and Australia and Arabia, nine months to reach Iceland, and ten months to reach St. Helena and Mauritius. It cannot be said that these places could not be reached by a passenger or a letter from Russia considerably within the times above given.

The date of the first appearance of an Influenza epidemic in a country, say in the capital or a provincial city, or frontier town, is sometimes spoken of as if the whole country were uniformly invaded at that date, which is far from being the case. Thus in this country there were probably some scattered cases of true Influenza as early as November, and it had attained some degree of prevalence in the western suburbs of London by the second week in December; though the epidemic in London can hardly be said to have begun earlier than the first days of January.

There are few places in England, if any, which could not be reached by a traveller from London in 24 hours, and indeed there are very few towns or villages where a letter posted at the General Post Office at 6 p.m. is not delivered early next morning. Yet the Influenza epidemic did not reach some of the remoter hilly districts in the north and west of England until the first or second week in March, *i.e.*, more than two months after its occurrence in London.

Not faster than
man can travel;

Even within much narrower limits, such as those of a Rural Sanitary district, the outbreak of the disease in different localities is by no means simultaneous, different villages being attacked at perhaps several weeks interval.

nor simul-
taneous over
large tracks of
country.

Thus in the Hartismere rural district, Suffolk, Dr. Barnes, medical officer of health, says: "The disease seems to have been imported into a part of the district and spread from there to other parishes at a later date. It has not affected the whole district simultaneously." He gives the date of the first case at Occold as December 24th, epidemic prevalence commencing there on January 5th, while at Botesdale, seven miles N.W. from Occold; the first case occurred on January 18th and epidemic prevalence began February 1st. A similar difference of dates was observed in different villages in the Abingdon rural district (page 127).

The following table taken from a report (dated February 1890) by Dr. W. W. Wynne, medical officer of health for the Mutford and Lothingland R.S.D., Suffolk, shows the date of the occurrence of the first occasion, so far as known, of Influenza in the several villages in his district.

Belton or Northern Division.

<i>Burgh Castle</i>	- An isolated parish, escaped.
<i>Bradwell</i>	- On high road from Yarmouth. Christmas and 10 days later. Severely attacked. School had to be closed.

* The atmospheric waves produced by the great explosion in the eruption of Krakatao on Aug. 27th, 1883, travelled completely round the globe in 24 hours in a direction from east to west, and in 35½ hours in a direction from west to east. ("Nature," July 17th, 1884). The dust from Krakatao was carried westward at the rate of about 75 miles an hour, or round the world in 10 days.

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<i>Belton</i>	-	-	Attacked first week in January.
<i>Fritton</i>	-	-	First case December 10. Imported.
<i>Hopton</i>	-	-	December 29th.

Lound or Centre Division.

<i>Ashley</i>	-	-	December 22. Severely attacked.
<i>Lound</i>	-	-	January 5.
<i>Herringfleet</i>	-	-	January 7.
<i>Scmerleyton</i>	-	-	December 24.
<i>Blundeston</i>	-	-	First week in January.
<i>Carton</i>	-	-	January 10. Very prevalent; not subsided, February 1st. School closed.
<i>Flixton</i>	-	-	Early in January.
<i>Gunton</i>	-	-	Date uncertain; a few cases still on February 1st.
<i>Oulton</i>	-	-	Middle of January. School closed.

Kessingland or Southern Division.

<i>Barnby</i>	-	-	January 15th to 29th.
<i>Carlton Colville</i>	-	-	Third week in January. Not subsiding, February 1st.
<i>Pakefield</i>	-	-	January 23rd.
<i>Mutford</i>	-	-	Same time as Barnby.
<i>Rushmere</i>	-	-	First week in January.
<i>Gisleham</i>	-	-	First week in January.
<i>Kessingland</i>	-	-	January 14th. Still very prevalent, February 1st.

Certainly it has not been shown that in this country the recent epidemic has travelled faster than human agency could have carried it. Nor, as I shall have occasion to mention more fully later on, have I seen any evidence that in this epidemic and in this country Influenza has anywhere occurred under circumstances which exclude the possibility of infection having been contracted from human sources within the possible limits, so far as known, of the period of incubation of the disease.

Suddenness of
commencement
also probably
exaggerated.

2. The sudden commencement of epidemic prevalence of Influenza is another point upon which I believe that some misconception and exaggeration have prevailed. It is true that the epidemic once started very rapidly attains a large development, especially among masses of people living under one roof and breathing the same air, as will be exemplified in the accounts to be given later of the outbreaks in various institutions, but close inquiry rarely fails to show that before the outburst there were probably preliminary cases of Influenza, recognized or unrecognized, from which infection might have been contracted. In the words of Sir Thomas Watson, "although the general descent of the "malady is very sudden and diffused, scattered cases of it like the first "droppings of a thunder shower have usually been remembered as "having preceded it." In London, as just remarked, there was a succession of cases of Influenza, for at least three weeks before the epidemic began, and an interval of longer or shorter duration is also recorded between the first known cases and the beginning of the epidemic in St. Petersburg, Paris, Berlin, Vienna, and other towns.

Dr. R. Sibley ("Universal Review," January 1890, p. 31) notes that the commencement of the present epidemic has been much less sudden than of some of those previously recorded, as for example that of 1833 when Sir Thomas Watson says, "On April 3rd I saw the first two "cases that I did see of the Influenza; all London was smitten with "it on that and the following day." It may perhaps be doubted whether the outbreak of 1833 was really so sudden as these words might seem to imply, and not preceded by any preliminary cases such as Sir T. Watson speaks of in the words already quoted.

Dr. Gairdner ("Glasgow Medical Journal," 1890), remarking on the apparent absence in the late epidemic of the sudden explosions so often previously described, says that it seems to confirm an impression which he "has long entertained that, in many of these narratives in "the past, imagination has done its work amid orally transmitted summaries of experience not very closely watched or accurately recorded in "the first instance. When the very first cases of a series or within a "limited population are detected and carefully watched in respect of their "date of outbreak, a sequential relation can be readily enough observed, "but if these are neglected so that a considerable number of foci of disease "are established, it may well appear as if a whole population is simultaneously attacked."

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An ambiguity of language which frequently tends to an exaggerated idea of the suddenness of the commencement of an epidemic is that which speaks of a number of persons as being "all down together," a phrase which may mean either that they all began to be ill at the same time, or that the later cases began before the earlier ones had terminated—a meaning compatible, even in Influenza, with several days' interval between them.

A circumstance which is frequently adduced in favour of the atmospheric origin of Influenza is the fact that the first sufferers in a locality or household are often persons who in their daily occupations are exposed to the open air: *e.g.*, the head of the family who goes out to work or business is attacked before his wife or children. But on the other hand the going about in the open air means, in the case of most people, more frequent opportunities of coming in contact with infection than fall to the lot of people who stay at home. Where exposure to the air can be dissociated from frequent opportunities of association with other persons it is not found that persons so exposed have suffered in larger proportion than other people, but rather the contrary. Thus fishermen at sea have escaped Influenza in a remarkable manner, as will hereafter be more fully mentioned. In some agricultural districts it has been noticed that the first persons who contracted Influenza were the farmers, who were in the habit of going every week to market; not the labourers employed in the fields.

Persons occupied
out of doors
often first
attacked.

May be explained
by their coming
most in contact
with other
people.

Again among railway servants the proportion of cases of Influenza has been greater among clerks, who are little exposed to the air, but come in contact with many people, than among engine drivers and firemen in whom these conditions are reversed. By the courtesy of the managers of the following railways I am able to give the following figures showing the per-centage attacked with Influenza among the engine drivers and firemen, and among the clerks on their respective lines:—

Railway.	Per-centage attacked with Influenza.	
	Drivers and Firemen.	Clerks.
Great Western - - - - -	4·2	5·1
Great Eastern - - - - -	8·3	17·4
Great Northern - - - - -	12·9	17·2
London and North-Western - - - - -	4·7	11·5

Compare also the following figures in two different departments of the London and North-Western Railway :—

		Number of Staff.	Influenza Cases.	Per-centage attacked.
Steamboat department (to March 31st)	-	586	35	6.0
Hotel department (to January 31st)	-	751	104	13.8

Of 122 seamen 6 were attacked; of 709 hotel servants 100 were attacked.

Other circumstances which are held by some medical men to point to the atmospheric as opposed to the contagious origin of Influenza are that in many cases it has been found impossible to trace the disease to infection from a previous case; and that it often happens that not all, or perhaps not any, of the persons who come in contact with an Influenza patient contract the disease.

These points will be discussed later on in connexion with the contagion theory of the disease.

Neighbouring
communities
may be attacked
at different
dates.

On the other hand a circumstance which militates strongly against attributing the origin of the disease to some state of the general atmosphere is that communities living close together, but having little communication one with another, may be attacked at different dates.

Thus at the Darenth Asylum the women patients were not attacked until a fortnight later than the men; the usual opportunities of meeting of the two sexes having been suspended when the men were attacked.

Again of two garrisons at Dover separated one from the other by an intervening valley, that at Western Heights was attacked on December 21st, the disease having been imported into an officer's household by children returning from London, and cases began to be numerous on January 5th, but the troops in Dover Castle were not attacked till January 10th, and then only three cases occurred.

Many institutions in and around London were attacked with Influenza, the usual date of commencement of the epidemic being between January 1st and January 5th. At King Edward's School, Southwark, however, at which the girls never go outside the grounds, the epidemic began on January 17th.

Another case is that of Her Majesty's Prison, and the City Lunatic Asylum at Winson Green, Birmingham. These two buildings stand side by side about 100 yards apart, the asylum being due east of the prison. An outbreak of Influenza began among the prisoners on January 7th, and affected a large number of them; but the asylum remained free from the disease until February 5th, when two cases occurred, and it soon spread rapidly among the patients. The wind during this period was for the most part from the S.W.

Instances lead-
ing to inference
of atmospheric
origin :—

The strongest piece of evidence which has come to my notice in favour of the atmospheric origin of Influenza is the following, taken from an able report by Dr. J. C. Thresh, medical officer of health for the Chelmsford and Maldon Rural Sanitary districts, which is published in "Public Health," June 1890 :—

"Bradwell is one of the most remote parishes in my districts; it is on the coast, and practically bounded on three sides by the ocean. It is 7 miles from the nearest railway station, and the highways all end in the village, as only the marshes lie beyond. On these marshes (which lie between the villages and the sea) farmhouses are dotted at intervals of $\frac{1}{2}$ to 1 mile, connected with the village by roads which in winter are well-nigh impassable. At each farm lives an overlooker or manager and the

farm labourers. It was on one of these marsh farms, $1\frac{1}{2}$ mile from the village that the first cases of Influenza in the district occurred. On the night of January 5th six labourers and a young girl (daughter of the over-looker) residing in the same house (Mr. Gale's farm at Waymark Wick) were attacked with violent headache, nausea, &c. This caused a little sensation when reported in the village. On the day but one following other similar cases occurred in the village itself, and a medical man was sent for (the nearest lives 4 miles away). He, hearing of the similar cases on the marshes went down to inquire, and then concluded rightly that he was dealing with a sharp and sudden invasion of the Influenza. Cases now cropped up in rapid succession, but Dr. Pettifer says a large increase in the number of cases occurred on the 13th, exactly a week after the first outbreak. During that week the epidemic had spread to, or had also attacked, the parishes of Tillingham, Dengie, Southminster, Burnham, St. Lawrence, Steeple, Mayland, and Althorn, affecting the school children there. In such a thinly populated district as this between the rivers Blackwater and Crouch it is difficult to conceive how infection from person to person should cause so rapid a spread of the epidemic."

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The following statements, given in reply to the Board's circular, may be taken as samples of a large number of others to a like effect, and as illustrating the kind of experiences which have led many observers to attribute the epidemic to an atmospheric cause.

"When the disease reaches a district a large proportion of the cases are seized simultaneously, or almost so, even in parts of the district most remote from each other. It does not begin in a certain place and spread from that place as a centre."—J. S. FENTON, M.D., M.O.H., Brackley, U.S.D.

"When a whole family has been attacked they seem all to have fallen ill almost simultaneously, or within a few days of each other. Three gentlemen left Northampton by train on a certain day, getting into the train perfectly well, and having no premonitory symptoms. Before getting to London each was attacked with a severe attack of Influenza."—G. H. PERCIVAL, M.B., M.O.H., Northampton R.S.D.

"A whole village suffers within a day or two of the first case. Another village is free, but may be attacked a week or so afterwards in a similar manner. In my experience a whole household falls ill almost at the same time."—J. W. DRYLAND, M.O.H., Kettering.

"Simultaneous outbreaks affecting a whole family who have not been in communication with infected persons or articles seem to substantiate the atmospheric origin of the disease."—J. T. KNIGHT, M.O.H., Carlton, near Nottingham.

It may perhaps be doubted whether in some cases another explanation might not have been forthcoming if all the facts of the case had been within the knowledge of the observer. The commencement of cases at about the same time in different parts of a district may be explicable by infection contracted when attending market on a particular day of the week, or Divine worship on Sunday. Thus in two districts, Llanfyllin (see page 90) and Devizes, a number of persons in different parts of the parish taken ill within a day or two of each other were found to have been at church the Sunday before on an occasion when there was reason to believe infection to have been present.

sometimes
otherwise
explicable.

In several instances where the Medical Officer of Health of a district has only been able to suggest some atmospheric condition as the cause of the epidemic, facts forthcoming from other sources have seemed to show that a different explanation was permissible. The following are instances:—

(a.)—Dr. Angus Mackintosh, medical officer of health for the Chesterfield rural district, an able observer, thus speaks of the outbreak of Influenza:—

"Influenza appeared suddenly and simultaneously on January 27th in a large number of persons, boys more particularly. The half of the

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boys in the Grammar School at Chesterfield were attacked on the morning of the 27th (Monday) and did not return in the afternoon. Since my last report I have ascertained that the Influenza has now covered the whole of this division of the county, rural and urban. A wave of it passed over the district on the 27th and 28th January. Whole families have been struck down at once without the slightest warning. It is not confined to any class; children, adults, and the aged suffer alike."

On the other hand Mr. W. S. Symes of Chesterfield, medical officer of health for the Brampton and Walton and Newbold and Dunston U.S. districts, states, on January 18th, that though no case of Influenza had been reported to him in either of those districts, yet he had seen several cases in his private practice. He gives the date of the first occurrence as the second week in December, and of the commencement of extensive prevalence as the last day of December and first of January.

The above statements apparently both apply to the Chesterfield U.S.D. The Medical Officer of Health of that district has sent no return.

(b.)—The Medical Officer of Health for Bury St. Edmunds gives December 28th as the date of the first case of Influenza in that town which came to his knowledge, and as that of the commencement of extensive prevalence. He considers that the disease is not infectious, but that its cause is in the air, probably germs, either alone or influenced by electric, thermal, and hygrometric conditions.

On the other hand the Medical Officer of Health of the Thingoe Rural district, who resides in Bury St. Edmunds, gives a circumstantial account (quoted on page 88) of the disease having been introduced on December 24th by a woman from France and spreading from her to other persons in association with her.

See also Wareham (pages 290 and 291).

Cause of Influenza if atmospheric.

Assuming the cause of Influenza to be in the atmosphere, it may be either some variation in the ordinary qualities of the air, or it may be the presence of some abnormal constituent. Under the former heading would come seasonal, climatic, and meteorological conditions; under the latter an aerial poison or miasma.

not season;

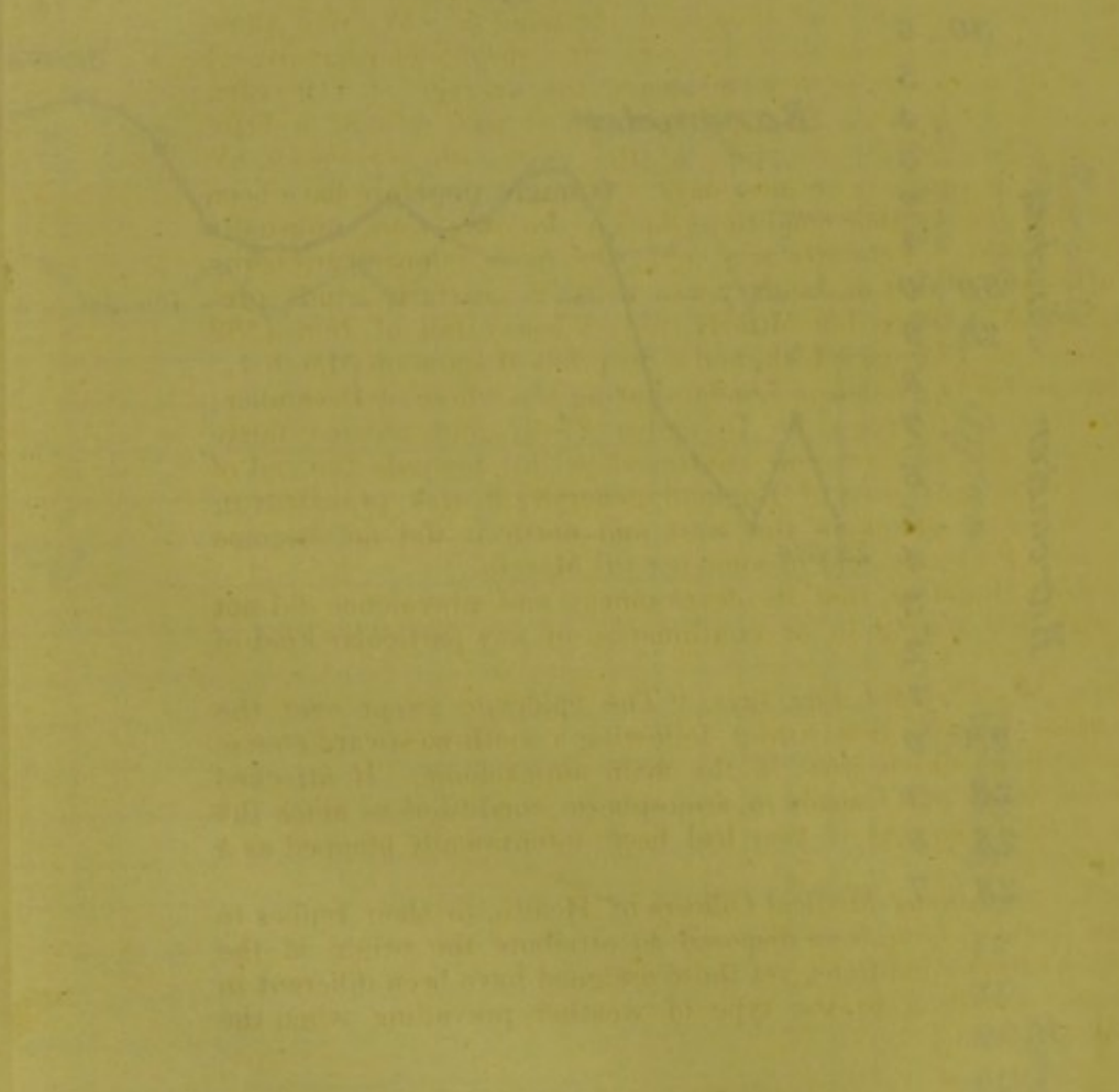
It will be seen from the preceding Table B. that fatal "influenza," whether epidemic, or the disease which goes by that name in ordinary years, is in this country a disease especially of the two winter quarters of the year, the deaths being most numerous in the first and fourth quarters, fewer in the second quarter, and fewer still in the third. That it does not wholly depend upon season is shown by the fact that in 1890, as in some previous epidemics, it prevailed in the northern and southern hemispheres at the same time: thus it was at the Cape and Chili in January, and at Buenos Ayres in February, at the time that it prevailed in many localities in this country. Again it will be seen by Table B. on page 4 that the epidemic of 1847, and the minor prevalence of 1859, attained their height in the fourth quarter of the year, whereas the prevalences in 1841, 1851, and 1855 did not begin till the first quarter. Influenza, too, both in the present and previous epidemics has prevailed in all climates, in the cold of Siberia and Canada and the heat of India and Africa, in the dry climate of Egypt and Arabia, and in the damp of the British Isles.

nor weather.

It does not depend, to use Sir Thomas Watson's words, "upon any mutations in the ordinary and obvious qualities of the atmosphere; upon any degrees or variations of its temperature, its motions, or its moisture; upon what is expressed in the single word 'weather.'" The accompanying diagram exhibits the various meteorological factors at Greenwich for the four months from November 1st, 1889, to February 28th, 1890, as recorded in the weekly reports of the Registrar-General.

Geological Survey of the United States

Section of the ...



... of the ...

It will be seen that for the first three weeks of November the barometer was high, and the temperature above the average; there was little rain; the winds, mostly westerly, were less than the average in force. A fall in the barometer and a gale from the west occurred on November 25th, after which a cold period with light easterly winds, but without much fog, followed and lasted till December 8th. From December 8th to 25th the weather was changeable, but on the whole mild with a fair amount of wind, mostly from the west. On December 25th a period of frost set in, and lasted till January 2nd, with high barometer, little wind, mostly from the east, and more or less fog on most days. On January 1st and 2nd the ice in some places was strong enough to bear skaters. On January 3rd a thaw suddenly set in with a fall of the barometer, rise of temperature, and change of the wind to S.W., and these conditions prevailed throughout January, the mean temperature of January being as much as 6.8° F. above the average of 119 years. South-westerly gales were frequent, and there was rainfall a little above the average, yet for the time of the year with a considerable amount of bright sunshine on most days. It might therefore have been considered that the weather conditions during January were unusually conducive to health. February was cold; the mean temperature being only 37.4° F., while that of January was 43.4° F.; easterly winds prevailed, moderate in force, but bitterly cold; a heavy fall of rain ($.82$ inch) occurred on February 15th, and a deep fall of snow on March 1.

Influenza probably existed in London during the whole of December; it showed signs of increase on December 27-31, and became fairly epidemic about January 1st, and continued so till towards the end of January. In the south-east of England generally it was prevalent in January; in many places in the west and north it did not become prevalent until February, and in some not till March.

It is evident, therefore, that its development and prevalence did not coincide with the setting in or continuance of any particular kind of weather.*

The Rev. W. Clement Ley says, "The epidemic swept over the continent of Europe this winter following a south-westward course under conditions which were in the main anticyclonic. It attacked the United States and Canada in atmospheric conditions as much the reverse of the former as if they had been intentionally planned as a contrast."

Although a good many Medical Officers of Health, in their replies to the Board's circular, have been disposed to attribute the origin of the epidemic to weather conditions, yet those assigned have been different in different cases according to the type of weather prevailing when the locality was attacked.†

* The recurrence of epidemic Influenza in 1891 began in March in Yorkshire. The winter had been very cold, an exceptionally severe and prolonged frost, with heavy falls of snow, lasting through December and January. February was cold and foggy, and almost entirely without rain. On March 9th there was a very heavy fall of snow, less severe, however, in Yorkshire than in the south-west of England. March and April were dry, with cold easterly winds.

† The following are instances of the various atmospheric conditions suggested to account for the origin of the Influenza epidemic in replies to the circular of the Medical Department:—

"Damp warm foggy weather."

"Sudden changes of weather."

"Entirely the result of sudden atmospheric changes."

"Catching cold. Cold N.E. winds."

"Wet and cold weather."

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preceding and
during previous
epidemics.

It will be seen on reference to Table B. that the fourth quarter of 1847, in which the last epidemic of Influenza occurred in London, had a high mean temperature (47.4°), as had also the fourth quarter of 1859, in which a minor prevalence occurred. On the other hand the first quarter of 1855, in which deaths ascribed to Influenza in London were unusually numerous, had the lowest temperature (34.1°) of any year in the whole series.

The dates of commencement of previous epidemics of Influenza in this country, and the preceding and concomitant weather, as given in Dr. Peacock's work, are here shown in tabular form.

Year of Epidemic.	Commencement of Epidemic.	Weather before and during Epidemic.
1847	November 22nd -	October remarkably warm. First two weeks of November dry, warm, and calm. Temperature on 15th, 54.3 ; on 19th, 32.1 . Calm, dense fog. On 22nd, wind veered to S.W.; temperature rose to 44.7 .
1837	January 7th to 10th -	Temperature fell 25° between December 22nd and 25th, 1836. On December 25th, gale from N.N.E., and much snow. Sudden and general thaw on January 2nd.
1833	Beginning of April -	Winter warm and moist. Spring, cold with bleak winds.
1831	Beginning of June, at height July 2nd.	Spring variable; warm days and cold nights. June and July warm and moist.

note to p. 77 continued.]

- "Mild season; damp soil; sudden chills and cold winds."
- "Fogs and stagnant air."
- "Warm damp S.W. winds."
- "Fog and E. wind." "Bitter N.E. winds."
- "Damp, mild, calm weather."
- "Infected condition of atmosphere, aggravated by cold easterly winds."
- "Perhaps electrical condition of air."
- "Wet weather and absence of wind." "Malarious."
- "Exposure to weather." "Exposure to cold."
- "Wave of infectious atmosphere; affecting susceptible persons."
- "Air-borne poison."
- "Epidemic malaria, no evidence of contagion."
- "Telluric poison, not contagious."
- "Peculiar state of atmosphere."
- "A germ floating in the atmosphere."
- "Microbe in atmosphere. Vague meteorologic influences."
- "An atmospheric wave."
- "Germs carried by atmospheric currents." "Microbes carried in air."
- "Poison, probably malarial, in atmosphere."
- "Poison given off by patient, and freely diffusible through air."
- "Spreads by air currents, as much as by personal contact."
- "Specific organism, diffusible in air."
- "Originating in ill-ventilated unsanitary buildings, not caused by cold."
- "Atmosphere contaminated by germ for all alike."
- "Rise in temperature of air."
- "Atmospheric cause. Incidence determined by telluric and geologic conditions."

Year of Epidemic.	Commencement of Epidemic.	Weather before and during Epidemic.
1803	End of February, at height in March.	Mild and damp; changing to frosty at end of March.
1782	Middle of May, at height June 11th to 25th.	Spring exceptionally cold, rainy, and inclement. Violent thunderstorms in May.
1775	November - -	Previous season remarkably equable.
1762	Beginning of April - -	Winter remarkably open; no frosts till spring.
1758	September and October	Warm and dry.
1743	End of April - -	April warm at beginning, cold at end.
1737	October and November	September fine; October fine and cool.
1733	February - -	Warm and moist.
1729	November - -	Cloudy and rainy.

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Of particular weather conditions, three may be especially mentioned as having been thought to stand in a causal relation to epidemic Influenza. Supposed influence of—

Fog.—Some previous epidemics are recorded as having been preceded by black fœtid fogs, and in some localities in this country, as at York and Langtoft, the development of local epidemics in 1889 has been attributed to fog. Fogs were also frequent during the week preceding the commencement of the epidemic in London; but on the other hand the month of January, which witnessed its chief development, was particularly free from fog, there being more or less bright sunshine on most days. It need hardly be said that fogs are common enough in London in years when there is no epidemic Influenza. fog;

Stagnation of the air is closely connected with fog: it commonly goes with anti-cyclonic conditions and a high barometer. In other words, there is a heaping up of the air over the locality, which produces a downward current and a slow general outflow in all directions, conditions which favour the retention in the lower layers of the air of impurities derived from organic sources, products of combustion, marsh exhalations, &c. A comparative stagnation of the air prevailed during the greater part of November and December 1889, though interrupted on several occasions by brisk breezes, but in January the epidemic continued to run its course notwithstanding the prevalence of high winds. Dr. Macphail, of Whifflet, Lanarkshire, says, (Glasgow Medical Journal, 1890,) "During our epidemic here we have had two wind storms, one of them of quite exceptional severity and duration, but they certainly were not followed by any decrease in the number of the cases. In fact within the week following the stagnation of air;

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and ozone.

“ severer storm we had probably more new cases than during any other
“ period of time. Since the onset of frost we have had fewer new
“ cases, though there have still been a good many.”

Ozone.—It was observed by Schönbein, the discoverer of this condensed and active form of oxygen, that its inhalation produced a painful affection of the chest, a sort of asthma with a violent cough, and he made the suggestion that the presence in unusual amount of this substance in the air might be the cause of the prevalence of Influenza and catarrhal disorders. This suggestion has been revived in connexion with the recent epidemic.

According to the Greenwich observations ozone was absent in the air or nearly so, from November 2nd to December 16th inclusive, during which period it was present only on eight days, on four days only did the amount reach 1° on the scale, and on the 9th it reached 3°. From December 19th to 27th ozone was present in considerable amount, except on one day, but from December 28th to January 2nd it was absent. During January on the contrary ozone was present in the air in large amounts, reaching 13·0 on January 7th, and 14·2 on January 23rd.

These amounts, however, have been exceeded at times when there was no epidemic of Influenza. I give a list of the dates in the years 1888 and 1889 in which the ozone exceeded 10 in the Greenwich scale.

1888.				1889.			
Day.		Ozone.		Day.		Ozone.	
March	9	-	11·0	March	7	-	10·5
„	28	-	11·3	„	8	-	17·5
„	29	-	11·2	April	4	-	11·2
April	17	-	11·5	„	12	-	10·5
„	22	-	10·8	„	29	-	10·5
May	1	-	11·7	May	30	-	12·0
„	2	-	16·5	„	31	-	12·8
„	15	-	11·5	July	10	-	15·8
„	16	-	11·5	„	23	-	10·5
„	17	-	19·7	Oct.	19	-	11·2
June	8	-	11·0				
„	12	-	12·2				
„	28	-	10·2				
July	24	-	12·3				
Aug.	20	-	10·2				
Nov.	12	-	11·5				
16 days.				10 days.			

The following are the mean daily amounts of ozone in corresponding weeks in December and January 1888-9, and 1889-90 :—

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1888-9.	Ozone.	1889-90.	Ozone.
Week ending Dec. 8, 1888 -	3·4	Week ending Dec. 7, 1889 -	0·0
„ „ 15 „ -	0·9	„ „ 14 „	0·6
„ „ 22 „ -	3·5	„ „ 21 „ -	1·6
„ „ 29 „ -	2·8	„ „ 28 „ -	2·2
„ Jan. 5, 1889 -	0·4	„ Jan. 4, 1890 -	0·4
„ „ 12 „ -	0·9	„ „ 11 „ -	5·9
„ „ 19 „ -	0·3	„ „ 18 „ -	3·9
„ „ 26 „ -	0·1	„ „ 25 „ -	5·4
„ Feb. 2 „ -	0·3	„ Feb. 1 „ -	1·3

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It cannot be said that these figures lend support to the ozone hypothesis of causation of Influenza. The most that can be claimed is that the abundance of ozone in January may have tended to the progress of the epidemic, though against this is the fact that the epidemic began at a time when ozone had for some days been absent.

2. A more probable hypothesis than that of meteorological influences is the one which attributes the Influenza epidemic to the presence in the air of some abnormal material, probably a living and multiplying organism, though no such organism has as yet been discovered. Epidemic Influenza is certainly a specific fever, and not merely an exaggerated form of ordinary catarrh such as may be brought on by exposure to cold or climatic changes; and the evidence is accumulating which connects specific fevers with the entrance into and multiplication in the body of minute living organisms. No such organism has as yet been detected peculiar to Influenza, but neither has there in such well-marked diseases of the class as small-pox and measles.

Supposed
abnormal
material in air :

On the hypothesis that the cause of Influenza is a foreign material present in the air, the assumption that this foreign matter is a living organism, capable of multiplication in the air, either generally or in that of particular localities, removes a difficulty, viz., that any non-living matter whether gaseous or particulate must become so diluted in the vast volumes of the atmosphere as to be present, (unless we accept the Hahnemannian doctrine,) in such infinitesimal proportions as to be harmless. But it is conceivable that a single living germ, brought by the wind or by human intercourse and let fall in a locality where the necessary pabulum existed, might speedily multiply till its progeny became so numerous that few susceptible persons in the locality could fail to come into contact with them, or (if we suppose that it is not the organisms themselves which are directly harmful, but the poisonous chemical substances which they manufacture in their life-processes) to take into their systems a mischievous dose of these products.

Microbe ;

This hypothesis fits in better than the climatic one with the irregular incidence of the disease, such as adjoining communities being attacked

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at different times or in different proportions. Weather changes can hardly fail to affect both alike; but a stray germ may reach one before the other, or on its arrival may find in one place but not in the other the conditions necessary for its propagation. It has not, I believe, been shown that any micro-organism multiplies in the air, but Dr. Symes Thompson suggests that dust in the air may supply a "raft" on which the microbe may live and be conveyed from place to place, and that the presence of dust in the air may be the condition which determines the prevalence of the disease in a particular locality. It is evident that the organism, if it is to live and multiply, must have some sort of food; it can hardly do so in pure air, and this food may be the organic matter present in the air of towns and crowded establishments. Thus, on this hypothesis, may be explained the severe incidence of the disease upon the inmates of crowded buildings, and the escape of persons, such as the deep sea fishermen, habitually exposed to very pure air. Moreover this hypothesis is not incompatible with the observed facts pointing to the disease being communicable from person to person, and being capable of conveyance from place to place by human agency, for the organism must be supposed to be capable of multiplication within the human body as well as outside, and if it may be wafted through the air, it may also be carried about in clothing, letters, and other articles appertaining to human beings. It is possible that particular states of the weather may favour the propagation of the organism (though as I have already shown, there is no evidence that the Influenza epidemic was associated with any particular kind of weather), and that particular bodily conditions such as "catching cold" may weaken the powers of resistance, and thus conduce to an attack.

or non-living
matter:

If the cause of Influenza be an aërial poison, but not a living organism or the product of one, it must apparently be either a gas or a non-living particulate material.

Of gases the only one which so far as I am aware has been suggested in this connexion is ozone, of which I have already spoken.

Under the heading of non-living particulate matter may be mentioned a suggestion which has been made in the daily press that the Influenza epidemic may have had its remote origin in the great floods of the Hoang-ho and other Chinese rivers which took place in the year 1888. In the "Times" of January 11th, 1888 it was reported that a great flood had occurred in China through the bursting of the banks of the Hoang-ho, and that an immense tract of thickly populated country had been inundated causing enormous loss of life. On October 9th, 1888, the newly constructed embankment gave way, and the low lying fertile land was a second time submerged. On January 1st, 1889, came also news of terrible floods in Manchuria. During the hot dry summer of these regions it is said that the fine powdery yellow mud left by the floods is carried up by the winds into the air in such quantities as almost to hide the sun. It was suggested that this mud, or the organic matter (or spores) which it contained, disseminated by the winds over the globe might have been the cause of the Influenza epidemic. On this hypothesis the epidemic should have begun in China, a country which is not hitherto known to have been attacked before February 1890, though an epidemic of Influenza might doubtless occur in remote districts of that vast empire without news of it reaching this country. Again, it is not clear why, seeing the rapid rate at which the epidemic when it occurred has spread over the globe, it should not have occurred in 1888 instead of in 1889.

Mud of Hoang-
ho.

Moreover it is stated in "Nature" of April 24th, 1890, on the authority of the "Shanghai Mercury," that there had up to the date of

writing been no epidemic of Influenza in China, and that the deposit left by the Hoang-ho is not alluvial mud, but unmitigated sand which for years refuses to grow any crops whatever.

It must be admitted that on this question we have little in the way of analogy to guide us. The behaviour of other diseases believed to be air-borne does not resemble that of Influenza. Of infectious diseases small-pox has been shown by Mr. Power and others to be probably transmissible through the air for some considerable distance, say up to a mile, and it has been thought that diphtheria may be thus transmitted even farther, though the evidence in favour of the aerial transmission of diphtheria is much weaker than that of small-pox. But it has not been thought possible that either might be carried by the air for the distances claimed for Influenza, *e.g.*, from one continent to another. Of air-borne non-infectious diseases I only know of malarious fevers (ague and the tropical remittent fevers) and hay asthma, but neither behaves like Influenza. The malarial fevers are endemic in certain localities, especially marshes: the hypothetical poison is said to be capable of being conveyed by the wind to distances up to three miles, but a belt of trees or a narrow intervening strip of water serves to arrest it.*

Hay asthma resembles Influenza in some of its symptoms, but only comparatively few persons are liable to it, and it never prevails as an epidemic. It is supposed to be caused in susceptible individuals by the irritation produced by the pollen of grasses.

The inhalation of irritating dust in rag factories causes, especially among workmen newly employed, a malady known among them as "flock fever," which presents some points of resemblance to Influenza. The symptoms are those of a severe catarrh of the bronchial passages, viz., shivering, difficulty of breathing, cough, soreness of the chest, and expectoration of mucus charged with dust. In about a week's time a tolerance for dust is established, the symptoms subside and do not recur as long as the man continues at work, but this tolerance is soon lost when exposure to dust ceases. Some men are more affected than others, and certain bodily states, such as loss of appetite, indulgence in strong drink, and catching cold, increase the hurtful effect of the dust.

It is conceivable that the cause of an epidemic of Influenza may be the presence in the air of an irritating material which affects different people more or less, or sooner or later, according to their different degrees of susceptibility or power of resistance: a tolerance having become established, the disease passes away. The relapses common in Influenza after renewed exposure to the air may be compared to the return of bronchial symptoms on renewed exposure to the dust.

The symptoms of Influenza, however, are those of a specific fever rather than those of an inflammation produced by local irritation, and it by no means necessarily affects the air passages.

A curious malady which may be compared with Influenza is the "stranger's cold" with which the inhabitants of St. Kilda, a remote island in the Atlantic Ocean, 60 miles from the Hebrides, are said to be affected on the arrival of persons from outside. The following passage is quoted from M. Elisée Reclus's "Géographie Universelle," "The small community of St. Kilda, consisting in July 1877 of 19 families and 76 souls, constitutes owing to its isolation such a distinct group that the arrival of a vessel with its crew and passengers, whose habits of life differ so much from those of the islanders, suffices to give the latter a general complaint accompanied with a cold. This illness

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Analogy of other diseases:

Malaria;

hay asthma;

irritating dust;

"Stranger's cold" of oceanic islands.

* Sir Thomas Watson, "Lectures," chap. xli.

“ which is called an ‘eight days sickness,’ or a ‘boat cough,’ is more dangerous for men than for women, and when the boat which has imported it comes from the Isle of Harris there are not infrequently deaths.”

This affection has been known since the last century, and in Boswell's "Life of Johnson" it is ascribed to the fact that landing can only be effected at St. Kilda when the wind is from the N.E.; the wind and not the stranger occasioning the epidemic cold. The inhabitants of other secluded oceanic islands are said, however, to be liable to a similar affection,* and a writer in the "British Medical Journal" of September 4th, 1886, states that a similar affection called *murri-murri*, indistinguishable in its main features from a severe "influenza cold," occurs in the island of Wharekauei, 480 miles E. of New Zealand, among the inhabitants, European as well as Maoris, on the arrival of a vessel. He says that the mere appearance of *murri-murri* is proof to the inhabitants—even at distant parts of the island, which is 30 miles long—that a ship is in port, so that on no other evidence people have ridden off to Waitangi, the port, to fetch their letters.

An interesting account of the "stranger's cold" in St. Kilda is given by Dr. Macdonald in the "British Medical Journal" of July 24th, 1886. He states that it follows almost immediately the arrival of a stranger, whether he has a cough at the time or is free from any bronchial affection. Some of the inhabitants even say that in the presence of a stranger they at once feel symptoms premonitory of the complaint, but these may be imaginary rather than real. As a rule, the invasion is sudden, but in some cases it is gradual. The patient complains of a feeling of tightness, oppression, and soreness of the chest; lassitude in some cases, pains in the back and limbs, with general discomfort and lowness of spirits. In severe cases there is marked fever and great prostration. Sooner or later a cough sets in, which for the first day or two is dry, then clear viscid expectoration appears, which soon becomes muco-purulent. The symptoms usually disappear in a few days, except the cough, which may last for several weeks. One attack does not protect against another, or only to a limited extent. The whole of the inhabitants (except the minister, who had been there in 1886, 18 years) invariably suffer when the first boat goes there every year, or when there is a long interval between the arrival of boats, but they do not now all suffer when strangers arrive within short periods of each other. It is not stated whether persons are attacked at first who have not been present at the arrival of the strangers; probably the arrival of a vessel would be the signal for a large proportion of the islanders to assemble at the landing place. Dr. Macdonald's explanation is as follows: "It is very probable that the air of St. Kilda is free from a number of disease-producing organisms which are rife in other parts where the inhabitants are more or less inured to them. In this way it is possible that these agents of disease are innocuous unless a chill, damp, or other condition inimical to health predisposes the individual to their attack. Not so at St. Kilda. This inoculation of the inhabitants does not take place, consequently they suffer when exposed to their influence."

The progress of the Influenza epidemic in a direction from E. to W., *i.e.*, in a direction contrary to the winds prevailing at the surface of the ground, is at first sight opposed to the hypothesis of an infective material being carried by the air. Dr. Buchan, of the Scottish Meteorology

Direction of
progress of
epidemic not
dependent on
atmospheric
pressure.

* Darwin, "Journal of a Voyage in H.M.S. Beagle," chap. 19.

logical Society, explains this progress by supposing the material to be caught up by the ascending currents into the upper regions of the air, where currents prevail in different directions from those at the surface of the earth, and brought down again in other places where descending currents (anticyclones) exist.

The rapidity and universality with which the volcanic dust from the great eruption of Krakatoa, in 1883, spread in the upper regions of the atmosphere all over the globe, manifesting its presence by peculiar optical effects at sunset, has been adduced to show the probability that the material cause of Influenza could be thus distributed. The eruption occurred on August 27th, and the sunset glows were noticed for the first time, at Panama, on September 2nd; Fanning's Island, September 4th; at Honolulu, on September 5th; and Strong's Island on September 7th.† Mr. G. J. Symons gives the rate of progress of the smoke stream at 75 miles an hour, in a westward direction.

In the case of the Krakatoa dust, however, there was an upward propulsive power to carry the dust into the upper regions of the air, greater than would appear to be available for the dispersion of the supposed material of Influenza, and the explosion took place in latitude about 6° S. close to the equatorial belt of ascending air, by which its dispersal over both northern and southern hemispheres would be facilitated. According to Mr. G. J. Symons, it does not follow that because there is a rapid current from the east in the upper atmosphere there, the same exists in other latitudes. I am informed moreover by the Rev. Clement Ley, inspector to the Meteorological Office, that the atmospheric conditions prevailing during winter over the central and northern regions of the continent of Asia and Europe are such that upward currents cannot occur there at that season; the cold prevailing over this great continental tract rendering it throughout the winter an area of high barometric pressure and descending currents.

Previous epidemics of Influenza have often been recorded to have been preceded by prodigies, such as volcanic eruptions, red rains, and abundance of insects of unusual kinds. The recent epidemic, however, was not preceded by any great volcanic outbreak, nor, so far as I am aware, by any unusual natural phenomena, such as the abundance of particular species of animals, unless it were the swarms of rats in Lincolnshire and other counties; the multiplication of these vermin being probably sufficiently accounted for by the destruction of the predatory animals and birds which keep them in check.

Mr. G. T. Brown, of the Board of Agriculture, writes on February 10th, 1890: "I have made inquiry and find that there are no reports of any special disease of food plants. The usual parasitic affections of cereals, *e.g.* ergot, smut, and ravages of insects, were not noticed to any great extent, except in the case of ergot, which was very abundant in some districts (Symes Thompson. Influenza, 1890. Introduction)."

Miss Ormerod, consulting entomologist to the Agricultural Society, in her annual report for 1889 says that great losses have now occurred for several successive years from attacks of moth caterpillars in orchards, but except orchard insects she is not aware of widespread attacks of any special kind of insect having occurred during 1889. She makes a similar statement in her report for 1890.

The greatest volcanic eruptions of recent years have been those of Krakatao (East Indian Archipelago) on August 27th, 1883; Tarawera (New Zealand) on June 10th, 1886; and Bandai San (Japan) on

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usual natural
phenomena
preceding
epidemic.

† "Nature," October 2, 1884.

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Hypothesis
of contagion.

July 15th, 1888. None of these appear to have had any relation in time or place with the late Influenza epidemic.

B. The opinion that Influenza is communicable from one person to another, although far from being generally held in the past, has nevertheless met with supporters from the time of Cullen (who named the disease "catarrhus a contagio,"—"a view," says Dr. Peacock, "little likely at the present day to find followers") downwards, and in particular was supported by Dr. John Haygarth, of Chester, in the latter part of the last century. Dr. Haygarth stated that Influenza was imported into Chester in 1782 by a gentleman who came down from London, being ill of Influenza at the time, to visit the family of the lady whom he was about to marry, and that this lady was attacked with Influenza two days after his arrival; hers being the first case which originated in Chester. He considered that Influenza did not spread from place to place quicker than human beings could travel, even in the last century when means of conveyance were much less rapid than they are now, and that the rapid development of an epidemic of Influenza as compared with that of other diseases known to spread by contagion might be explained by the circumstances, 1st, that the period of incubation, as shown by the above-mentioned case, is short, so that several successive generations of cases might arise in the time which it took small-pox (which has an incubation period of 12 days) to reproduce itself once, and 2nd, that the susceptibility to the disease must be very widespread, as shown by so many persons being attacked by it. He also pointed out that owing to the symptoms of the disease being less conspicuous than those of small-pox for instance, there was more opportunity for persons to come in contact with infection without being aware of it.

The latter consideration is strengthened by the circumstance that, in an epidemic of Influenza, besides the severe and well-marked cases, many persons suffer from lighter and transient ailments, as headache, catarrh, or a feeling of lassitude with flying pains in the limbs, which are not of sufficient severity to prevent their going about their business and mixing with other people as usual. If we suppose that these are really mild cases of Influenza, we may find in them an effective agency for the wide spread of the disease; just as with small-pox it is not the severe confluent cases, which are confined to bed, and recognised and shunned, that spread the disease, so much as the mild ones, in which the eruption is confined to a few pimples, and the patient is all the time able to pursue his daily avocations.

In the course of the late epidemic the opinion of the communicable nature of Influenza appears to have gained ground, and many medical men who at first disbelieved in its communicability from person to person have come round to the opinion that this is at least one of the modes by which it is spread.

Others indeed go so far as to consider that the disease spreads solely by direct communication (contagion or infection);* thus one medical

Distinction
between
"infection" or
"contagion."

* There is an ambiguity about the use of the words "contagion" and "infection," with their derived adjectives, which makes it sometimes rather difficult to understand the exact sense in which they are employed even by medical men.

Wynter Blyth ("Dictionary of Hygiene," Article,—Contagion) says, "The word 'contagion' is commonly used to express the communication of disease from one body to another whether by means of actual contact, or through a medium such as the air, &c. By some, however, 'contagion' is used only to express a communication by direct contact in contra-distinction to 'infection' which operates at a distance." The author himself employs the words in the latter sense, for he divides communicable diseases into two classes: (1) Those transmitted only by direct

officer of health says: "I am quite convinced that, if I had the time, I could trace all cases from a previously existing case."

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Accompanying this report is a memorandum by Dr. Bruce Low, in which the contagion theory of the causation of Influenza is discussed with an affirmative result (pages 243 and 257). I append also a report (page 265) by Dr. Casey, Medical Officer of Health of Windsor, in which various facts are given pointing to the same conclusion.

The arguments in favour of the communicability of Influenza are the following:—

1. *The frequent occurrence of multiple cases in succession in a household.*

Cases occur
frequently in
succession.

There is, as has been already said, much conflict of statement on this point, but some of the statements to the contrary were made early in the course of the epidemic, and the medical men who made them saw reason afterwards to modify them.

It was stated by some Medical Officers of Health that of the secondary cases, the earliest were generally in persons who had been most closely associated with the first patient. Thus, the head of the household being the first to contract Influenza, the next case was that of his wife, and afterwards the children.

2. *In numerous instances the first case in a household or neighbourhood could be traced to exposure to infection from a previous case, or a visit to an infected locality.*

First cases
traced to ex-
posure to in-
fection.

Instances in which Influenza, contracted by a visit to an infected locality, or introduced by a convalescent or otherwise, has spread in other members of the household in a locality otherwise free from the disease, are too numerous to mention, but in many of these (especially in the earlier part of the period) the spread of the disease was not traced beyond the invaded household, and if an epidemic has subsequently arisen, it has appeared to have a different origin.

inoculation or immediate contact (contagious), as syphilis, hydrophobia, and parasitic skin diseases; (2) Those transmitted through the medium of the air or other carrier (infectious), as small-pox, scarlatina, and measles.

This appears also to be the sense in which the words "contagious" and "infectious" are used in Acts of Parliament.

It would appear that in ordinary speech the use of the words is not strictly limited, "contagious" meaning, according to dictionaries, transmissible by contact or for short distances through the air; "infectious," transmissible through the air for, it may be, longer distances,—a difference in degree only.

In medical use, however, a sharper distinction seems to be drawn. One Medical Officer of Health considers Influenza to be "most infectious, but not in the least contagious," another thinks it to be "contagious, non-infectious; spreads like measles;" some consider it to be both contagious and infectious; while others do not admit it to be either. These replies, while well illustrating the diversity of opinion which prevails on this and other points relating to the disease, agree in showing that the difference between "contagious" and "infectious" is looked upon as one of kind, and not merely of degree.

On the other hand, Parkes ("Practical Hygiene," 4th edit., foot-note to chapter 19) says, "It will be seen that the old distinctions between infectious and contagious diseases, and between miasmata and contagia are not adhered to. They were at no time thoroughly definite, and are now, I think, better abandoned."

In French *contagion* and *contagieux* include both "contagion" and "infection" in the English sense. *Infection* according to Vallin ("Traité des Désinfectants et de la Désinfection") has received so many meanings as to be difficult to define, but implies especially the idea, conformable to its etymology, of contamination. *Infect* means having a bad smell; *infectieux* means contaminating with disease-producing agents, such as effluvia, miasms, germs, contagia and parasites (thus apparently not necessarily implying derivation from a previous case).

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Instances at
Llanegryn;

The following are instances in which a household outbreak, originating in imported infection, has developed into a local epidemic:—

“The manager of a slate quarry whilst in London for a few days lodged at a house where there were two cases of Influenza. He returned home on January 4th ill; he was seen on January 5th, and had well marked symptoms of a severe attack of Influenza. On the 6th there were nine other cases in the same house; five or six days later several of the workmen were laid up, and since then the disease has been prevalent in this locality.”—H. P. ROWLANDS, M.O.H. Llanegryn district, Dolgelley, R.S.D.

Bury St. Ed-
munds;

On December 24th a woman arrived at Bury St. Edmunds (which is in the centre of the Thingoe rural district) from Chantilly. I have reason to believe that the day before she left France she was attacked with Influenza, and she was ill for two or three days after her arrival in Bury St. Edmunds. On the 26th and 27th two of her female friends living in neighbouring houses, and with whom she was very intimate, were seized with Influenza. On December 28th the husband of one of them showed signs of Influenza; this man worked in an ironmonger's shop, and by January 2nd two or three other men working in the same shop had been attacked. I believe that these were the first or some of the first cases which occurred in this neighbourhood. I could also trace one or two other cases direct to the French woman. During the first week in January the disease had become very prevalent in Bury St. Edmunds, and it is now (January 18th) spreading to the adjacent parishes in the Thingoe rural sanitary district.—C. S. KILNER, M.B., D.P.H., M.O.H., Thingoe R.S.D.

Wilton;

At Wilton the first case of Influenza occurred on December 24th, 1889, and the disease began to be extensively prevalent the week following.

“It was brought from Greenwich by a person suffering from it. Three days afterwards two patients who had been exposed to infection from him were taken ill, and then each of the households to which these belonged. In all cases personal communication seems to have been the cause.”—C. R. STRATON, M.O.H., Wilton U. and R. districts.

For the following history I am indebted to Mr. G. Hodges, of Cleobury North, Salop:—

Burwarton;

Burwarton is a remote village in Shropshire in an elevated situation on the eastern slope of the Clee Hills, and 9 miles from the nearest railway station.

The first cases of Influenza occurred in the family of the rector of Burwarton. Shortly before Christmas the rector was at Portsmouth where he spent a day and two nights, viz., from 8 p.m. on December 18th to 7 a.m. on December 20th with a gentleman who was suffering from a very severe cold, with bronchitis and great depression, though his illness was not recognized as Influenza. (The Medical Officer of Health for Portsmouth reports that Influenza was first recognized there on December 9th, and began to be extensively prevalent about January 8th.) On his return on the night of December 20th, the rector was attacked with pain and running at the eyes, with weakness, but was able to go about and attend to his duties for about 10 days, when his temperature ran up and he had to take to his bed. His daughter was taken ill of Influenza on December 22nd, and two children on December 25th, also two others on December 23rd, but these were much milder cases. Within a week it had extended to the whole household with the exception of the rector's wife, and one housemaid.

On December 25th one of the servants went home ill, suffering as it was thought from a different disease. A day or two after her coming her mother was taken ill, and her brothers and sisters, seven in number, in the next week; all presumably suffering from Influenza, though they did not see any doctor.

Two young men and a boy (W. B.) who sat nearest to the rector in church, being members of the choir, were attacked within a week after him. Mr. B., the boy's father, is head gardener at Burwarton Hall, manager of the works upon the estate, and secretary to the village co-operative stores; consequently men are continually at his house for orders and upon other business. The boy W. B., besides associating with other boys, is always going about among the employes on the place. He felt ill on Sunday, December 22nd, after being at church, and was laid by a day or so, and then went about as usual. On January 2nd his mother was taken ill suddenly with a well-marked attack of Influenza, having severe headache and pain in the back, with extreme prostration. On January 4th her little girl was ill, and another boy was unwell afterwards. Mr. B. himself and one boy and girl escaped.

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Near Mr. B.'s house is a row of six cottages numbered 1, 2, 3 and so on, beginning next to his house. The first case of Influenza in these began on January 6th in No. 1, the patient being a young man who worked in the Hall gardens. On January 14th his brother was ill, and their mother was poorly one day, but a younger brother escaped.

At No. 6 resides the manager of the village co-operative stores, who is in frequent communication with the rector and Mr. B. He himself escaped Influenza, but his little girl was taken ill on January 9th, his wife on January 13th, and four other children in rapid succession afterwards.

In No. 5 of this row lives the rector's servant. His wife was ill of Influenza on January 17th; one child on January 20th; and another on January 21st. The man had been previously unwell, but did not lie by; he had a headache and cough on January 21st.

In No. 4 a little boy had bronchial catarrh on January 11th, and the baby had Influenza on January 15th. These were the only children in that family; the parents escaped.

In No. 3 Mrs. G. was taken very ill on January 18th, and a little girl on January 21st. The man had been previously unwell with congestion of the liver, but without symptoms of Influenza.

No. 2 was unoccupied.

About the same time that Mrs. B. was ill, several other families were affected with Influenza. In one the man who was affected, being a woodman, had to go to Mr. B.'s for orders. In another a game-keeper was the first affected. He had been talking to the rector's son during the first week of the outbreak, and was ill on January 1st; three or four of his children were ill, but his wife and baby escaped.

Mr. Hodges himself was unwell on January 4th to 8th, and again February 16th-18th. He believes these to have been mild attacks of Influenza, being quite different to an ordinary chill, especially in the sense of nervous prostration.

By February 22nd Influenza had appeared in several of the neighbouring villages, fresh cases occurring almost every day, and on March 8th it was very generally prevalent in the neighbourhood.

The district is a sparsely populated one, the villages being small and scattered. Burwarton is a central place, and the co-operative store there is largely attended by the people living in the surrounding district. Many cases, however, have occurred where it is difficult to trace any communication with Burwarton. The period of incubation seems uncertain; in some cases two or three days, in others a longer time having elapsed since the exposure. The outset in well-marked cases has been very sudden, with or without the premonitory symptoms of a cold in the head, &c.

It would seem, according to Mr. Hodges, that men who are much in the open air are less liable, or have the disease lighter, than women and children. It seems also that some persons are insusceptible of the infection.

The following account of an outbreak at Llanfyllin, Montgomeryshire, is given from information furnished by Mr. F. Felix Jones, Medical Officer of Health:—

The first case of Influenza at Llanfyllin, and which proved fatal, was that of a governess in a family at Llwyn, who was seen on December 26th. She had complained for two days before of having "had a cold," but the more marked features of Influenza appeared on the 26th. A few days before (the exact dates cannot be given) she had been engaged in unpacking parcels of cloth from a large establishment in the west end of London, in which during the fortnight before Christmas a large number of the employés had suffered from Influenza. (See page 123.)

On December 27th a kitchenmaid in the same house who had assisted the governess in unpacking the parcels was taken ill with Influenza. No other cases occurred in this house.

On December 30th two of the children of the master of the workhouse, about a mile distant (between whom and the Llwyn family there had been since the 25th communication personally and by letter respecting the postponement of a Christmas tree), were attacked by the same disease.

On Sunday morning, December 29th, three persons from the Llwyn household, themselves in good health, attended the English service at the Llanfyllin parish church, on which occasion there was a large congregation. The gas had been escaping for some time before the service commenced, and the air of the building was much contaminated by it.

On December 31st and January 1st the epidemic broke out in the town in several centres, and entirely among people who had attended this morning service. In five households two or more persons were taken ill without appreciable interval between them. Of the first 40 cases almost all were people who had attended the morning service, but the majority had had no personal communication with the members of the Llwyn household who were present.

The few early cases among other than church people included the workhouse master's children as above; the next was a lad taken ill on January 5th, and not in communication with Llwyn, but by this time the disease was widely spread in the town.

The service on Sunday evening was in Welsh, and by that time the air of the church was purified. The congregation consisted partly of townspeople, some of whom had attended the morning service, partly of country people, but the latter did not then contract Influenza, for the rural district did not suffer till later.

3. *The special incidence of the disease upon persons liable to come into contact with infection.*

This has already been spoken of in connexion with the question of the influence of exposure to air, and reason was there shown for believing that the often-observed incidence of Influenza earliest upon adult males was due, not to their exposure to the air, but to their more frequent opportunities of coming in contact with infection.

In the suburban districts around London it has very commonly been observed that the first cases were all among men who went to town on business every day, their wives and families being next attacked, and the locally employed population of tradesmen and artizans later still.

As instances, I give on pages 305 and seqq. some notes with which I have been favoured by Mr. Murphy, of Twickenham, Dr. Graham, of Weybridge, and others.

In industrial districts where people work many together in large factories and workshops, it has often been noticed that the earliest case in a household is usually the man or a breadwinner.

Dr. Niven, Medical Officer of Health for Oldham, gives, from particulars supplied to him by medical practitioners in that town, the

following figures respecting the first cases of Influenza in 125 households :—

FIRST CASE.					
Child.		Adult.			
At school.	Not at school.	Breadwinners.	Housekeepers.	Otherwise.	
13	2	96	9	5	
15		110			

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Dr. A. S. Underhill, Medical Officer of Health for Tipton, writes :—

“In some cases, probably in all, the cause is direct infection. I have not been able to trace direct infection in every case, but the first case in many infected houses has been the man, who, as a rule, is most exposed to infection, as in some of the slighter cases the patients freely move about their business in the workshops. In nearly every case most of the members of a household are affected.”

The working classes are noted as being affected first in the following districts :—

Rhymney. Wrexham. Erith.	Northfleet (cement burners). Coventry. Durham.
--------------------------------	--

On the other hand, in many “residential,” sea-side, and rural districts,* it has been noticed that well-to-do households have been the first attacked, probably owing to persons of this class going about more, seeing more company, and in other ways coming more into contact with their neighbours than the working class do in such districts.

(Perhaps, however, the apparent greater incidence upon the upper class may be in part due to medical advice being more frequently called in by them than by poorer people. The same explanation also applies in the case of men of the working class, who, being entitled when ill to the services of their club doctor, come under medical observation, whereas for their wives and children, who are not in any club, the expense of medical attendance is not incurred.)

The incidence of the disease upon medical men has been very great. Of the Medical Officers of Health (mostly in private practice) who have sent in replies to the Board’s circular, a large number have reported themselves victims of the epidemic.

In Windsor, Dr. Casey reports that, of 11 resident medical men, 10 have suffered from it.

Nurses in hospitals have also suffered in large proportions; patients in hospital for other complaints commonly escaping.

The comparatively small tendency of Influenza to spread among hospital patients has been frequently illustrated. Thus the Medical Officer of Health for Warrington reports that the nursing staff at the fever hospital were attacked, but that 40 patients in hospital for scarlet fever escaped.

At Bridgend three cases were admitted into the workhouse infirmary, but the disease did not spread.

Other examples of the absence of tendency of Influenza to spread among patients in infirmary for other complaints will be found in the appended reports of the outbreaks at the South London District Schools, at St. Mary’s Orphanage, North Hyde, and at Pentonville Prison.

* Examples are :—Salisbury, Lymington, Winchester Rural, Barton Regis, Friern Barnet, Poole, Denbigh, Bala, Wantage, Ecclesall Bierlow, Orrell, Penzance, Hornsea, Conway, Llanfairfechan, Tenby, Clevedon.

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but not always.

Railway and
post office
officials often
first.

Children often
escaped or suf-
fered lightly.

Persons not in
contact with
others escaped.

On the other hand I have received from Dr. Swain of the Bristol Royal Infirmary an account of Influenza having spread in a ward after a case had been introduced. He states that there was no Influenza in the ward on January 21st; there had been one or two cases among the household staff, but none in any of the wards. On January 22nd at 11.30 a.m. a girl was admitted with the usual symptoms of Influenza. In the evening of January 23rd, 3 other patients in the same ward, who had been in hospital respectively 4 weeks, 10 days, and 7 days, began to suffer with similar symptoms, and another on January 27th. There were 12 patients in the ward altogether. The patient admitted with Influenza occupied bed No. 7, and the numbers of the beds occupied by the 3 next cases were 5, 9 and 10; the two latter being side by side.

Mr. E. C. Stabb, of the Royal Free Hospital, London, states that in the wards of the hospital there were about 20 cases including 12 nurses. Only one case of Influenza was admitted, viz., on January 1st, the others developing the disease in the hospital; they all occurred early in January. They occurred in various wards, not specially in the one into which the Influenza patient was admitted. The nurses too were indiscriminately affected.

Railway officials and servants have in several districts been the first to suffer from Influenza.*

Thus the Medical Officer of Health for the Walsingham rural district says, "Railway officials at different stations suffered early, so that railway ways seem to have been one chief channel for the conveyance of the disease."

Post office officials have suffered early and severely in many places; in some villages the postmaster has been the first person to suffer from Influenza, and at Paignton the disease contracted by that official, it is believed from a foreign letter, spread and developed into an epidemic.

The post office officials were the first to be attacked with Influenza at Newcastle-on-Tyne, Swansea, Brighton (where, however, the telegraphists and not the letter sorters suffered first), Dorchester, and Reading.

Children, if they contract Influenza, as a rule suffer less than adults, and in many districts are reported to have, comparatively speaking, escaped the disease. In several districts, however, the children attending particular schools have suffered extensively from Influenza. Such outbreaks are reported at Whitland, Wimborne, Selborne, Liskeard, and in East Sussex and other districts. Notes by Dr. Bruce Low of some village outbreaks in Lincolnshire and Yorkshire, in which school children were especially affected, are appended.

4. *Persons living under circumstances in which the possibility of infection can be excluded have escaped Influenza.*

It is difficult on land to find persons living under such circumstances.† No one in this country leads the life of a hermit. Persons living in the most secluded places are more or less in communication with their fellows, as by letters and purchased articles, if not by attending markets, places of worship, or schools; and in all these ways infection may be introduced. In establishments, such as prisons and lunatic asylums, in

* Examples:—New Swindon, Mexborough, Bromsgrove, Rowsley, Ashby Rural, Bungay, Swaffham, Walsingham, Whitland, Hendon.

† It is said that the solitary meteorological observer stationed at the alpine observatory on the Sonnblick peak, in Austria, suffered from Influenza in January 1890. How far he was actually isolated from the rest of mankind I do not know. Influenza is reported to have been very rife among the inhabitants of the Alps of Styria and the Tyrol.

which the inmates are not permitted to go outside the walls, a communication with the outside is maintained by means of the staff, among whom in such institutions the first cases of Influenza have usually occurred; as well as by visitors.

At sea opportunities of communication are fewer and more easily remembered. Although several cases have been reported during the recent epidemic of outbreaks on board ship, I have not heard of any in which the outbreak commenced at sea in vessels many days from port.

The often-quoted case of the kind is that of Admiral Kempenfeldt and Lord Howe's squadrons in 1782. The former sailed from Spithead on May 2nd; on May 29th the crew of the "Goliath" were attacked with Influenza, and those of the other vessels at different times, so many of the men being rendered incapable of duty that the squadron was obliged to return to port about the second week in June, having had no communication with the shore, but having cruised solely between Brest and the Lizard. (It will be observed that it is not said that the fleet had had no communication with any other vessel, and also that the vessels were not all attacked at the same time, but one after the other.) Lord Howe's squadron sailed also in the beginning of May for the Dutch coast, and towards the end of the month Influenza appeared in ships of the squadron although there had been no communication with the land. If the following quotation from Dr. Gregory* refer to the same outbreak, the facts seem to show that personal communication may have had to do with it:—

"Our fleet was watching the Dutch ships in the Texel. The whole fleet was in excellent health and spirits, when a cutter arrived from the Admiralty, and the signal was given for an officer from each ship. An officer was accordingly sent with a boat's crew from every vessel, and returned with orders, carrying with them also, however, the Influenza. In the lieutenant's ship (from whom Dr. Gregory received the account) he was one of two who alone escaped it; the other ships fared scarcely better. Very early one morning the look-out frigates gave the signal for a fleet in sight. The seamen immediately sprang to quarters with alacrity, and the fleet was cleared for action. . . . But the men soon began to drop down beside their guns completely exhausted, and the officers themselves, hardly able to stand, found on making their rounds the seamen lying extended on the deck. . . .

"Although the helpless state of the British fleet was well known in Holland, no attempt was made to molest them, for the Dutchmen were in no better plight themselves."

Another often-quoted instance† is that of the "Stag," which on April 3rd, 1833—the day on which the Influenza epidemic began in London—was coming up the Channel, and arrived at 2 o'clock off Berry Head (not Beachy Head, as quoted by Parkes, in "Reynolds's System of Medicine"), on the Devonshire coast, all on board being well at the time. In half an hour afterwards, the breeze being easterly and blowing off the land, 40 men were down with the Influenza; by 6 o'clock the number was increased to 60, and by 2 o'clock next day to 160.

(In this narrative there seems to be some inaccuracy, for at Berry Head an easterly wind would not blow off the land, but down the English Channel. Nor is anything said as to any previous communication with the shore, *e.g.*, at Plymouth or Falmouth.)

Inquiries have been made as to the occurrence of Influenza among two classes of persons who, by their occupation, are for long periods almost debarred from communication with the rest of the world, *viz.*, the deep-sea fishermen and the keepers of lightships and rock lighthouses, and

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Previous
instances of out-
breaks at sea.

* "Life of Sir Robert Christison."

† Sir Thomas Watson ("Principles and Practice of Medicine," vol. II. p. 441).

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Deep-sea fisher-
men escaped;

both classes of men appear to have been exempt from the disease, with the exception of a few cases contracted ashore, or by communication with other cases.

As regards the deep-sea fishermen, a form of queries prepared in the Medical Department was, through the courtesy of the National Sea Fisheries Protection Association, and the Mission to Deep-Sea Fishermen, distributed at the principal ports engaged in the Dogger Bank fishery, and information in reply was received from Yarmouth, Lowestoft, and Grimsby. Mr. A. H. Smee kindly obtained information on a similar form prepared by him respecting the crews of the boats (mostly from Brightlingsea) engaged in oyster dredging on the Skilling Bank in the North Sea, and respecting others fishing off the mouth of the Thames.

Local inquiries were also made at Grimsby by Dr. Bruce Low, who reports on the subject as follows:—

“ My inquiries were made through the Medical Officers of Health for Grimsby, Cleethorpes, and Clee-cum Weelsby, and also through the Port Sanitary Inspector, but the results were negative.

“ The fishing smacks leaving Grimsby port are divided into four classes:—

1. Trawlers who go to the Dogger. These number 700, each employing about 5 or 6 hands. They remain at sea from 8 to 10 days, sometimes longer if the weather is bad.*

2. Cod fishing vessels furnished with tanks for bringing back live fish. These go also to the Dogger, and a number in summer (but only a few in winter) go as far as the Faroe Isles. They carry 8 to 11 men each. There are about 150 of these vessels. When fishing off the Dogger, or N.E. of it, they remain away 8 or 10 days, but when they go to the Faroes they are away three weeks or a month.

3. Oyster boats. These work off Heligoland and Schilling. There are about 25 such smacks, and they carry each six men. They are generally away about 14 days.

4. The coast fishing boats carry four hands. They gather bait (whelks, &c.) for the others. They seldom go far from shore, but may be some days away from home.

“ Through Mr. Keetly (Medical Officer of Health, Cleethorpes), and the Port Sanitary Inspector, Grimsby, I have only succeeded in getting particulars of six cases of Influenza on board the fishing smacks, and in all cases the information tends to show the illness was contracted on shore before leaving for the fishing grounds. I have obtained no information as to the actual meeting of foreign fishermen with our own on board each other's vessels. So far as my own investigation goes, it would appear that Influenza was not imported to this country by the fishing fleet, nor, so far, is there any evidence that any fisherman contracted the disease at sea from any peculiar atmospheric contagion, or from foreigners coming on board his boat, or *vice versa*.”

The secretary of the Great Grimsby Smackowners Association says (March 14th, 1890):—

“ I have made very diligent inquiries among the smacksmen as to Influenza, and so far have not been able to trace a single clear case. There have been plenty of cases of colds and rheumatism, &c. but none of Influenza. The only suspicious case I know of was a man brought in from sea very ill with some of the symptoms, but I found he had only been out to sea six days (? before attack, or before landing), and

* It should be mentioned that, during the time that the boats are out, communications are kept up between them and the shore by steam carriers, which convey the fish to London, Hull, and Grimsby.—H. F. P.

not more than 40 miles from land. He had spent the fortnight previous to sailing at Nottingham. None of the other hands took it, although they occupied the same cabin.”

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Similar testimony as to the absence of cases of Influenza among the fishermen on the Dogger Bank is given by the Mission to Deep Sea Fishermen, no cases having been treated up to March on either of the hospital smacks of that society.

In the journal of this society, “Toilers of the Deep,” for March 1890, it is stated: “The Influenza has attacked several of our men, but oddly enough the doctors have observed none at sea, though carefully on the watch for it.”

Later, however, one outbreak on a smack was reported through the same society. The case was as follows:—

The “Queen Victoria,” with a crew of 10 hands, sailed from Yarmouth for the fishing ground—the tail end of Dogger—on February 28th. She called at Gravesend and stayed there eight days, during which time several hands went up to London. On March 10th she was boarded by two men from the fish carrier “Australia,” who had recently had Influenza. On March 14th one of the hands of the “Queen Victoria” was taken ill with Influenza, and others two days later, in all 8 out of the 10 being attacked.

It appears therefore that the conditions of life on a fishing smack do not prevent the spread of Influenza among the crew if introduced.

From Great Yarmouth Sir E. Birkbeck sends particulars of 20 smacks, each with a crew of six men, which had sailed for the fishing ground—North Sea, lat. 54° to $54^{\circ} 50'$ —at dates between November 26th and December 14th, returning between January 29th and February 7th: on none of them did any Influenza occur.

Mr. A. H. Smee gives particulars of voyages of smacks from Brightlingsea, each carrying six hands, engaged in oyster dredging on the Skilling Bank, in the North Sea, in November, December, January, February, and March, on none of which did any Influenza occur.

He also gives particulars of 40 fishing boats from Leigh, carrying crews of from two to five hands, engaged in January in fishing off the mouth of the Thames at a time when Influenza was very prevalent in places both on the Kent and Essex shores. In only one of these did a case of Influenza occur, and this began on the day of sailing. These boats are out usually five or six days on a voyage.

Mr. Wrench Towse, secretary of the National Sea Fisheries Protection Association, informs me that the secretary of the Lowestoft branch reports that he can only trace two authentic cases of Influenza among smacksmen, and they were first attacked while their vessels were in the harbour. No case is known at Lowestoft, where anyone was attacked at sea.

By the courtesy of the Trinity House I am able to give the following facts respecting the occurrence of Influenza among the keepers of lightships and rock lighthouses. (See page 176.)

also lighthouse
keepers.

(It should be mentioned that even these men are not absolutely cut off from all communication with their fellows, for not only are they now relieved more frequently than formerly—at intervals rarely exceeding six weeks—but they are also often able in case of necessity to communicate with the shore by signalling to passing vessels.)

There are on the coasts of England and Wales and the Channel Islands 51 lightships, each with a crew of seven men, and 16 light-houses on detached rocks or piles, each containing two or three keepers. There are also lighthouses on the Farn Islands (2), Coquet Island, Lundy Island, and Bardsey Island; the keepers of these have their families residing with them, and on the two last-named islands there are other inhabitants as well. In all the number of keepers on these

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lightships and lighthouses amounts to about 415. Among these the following cases of Influenza occurred:—

1. At Coquet Island three children of a light-keeper were ill with Influenza: prior to the attack there had been frequent communication with the town of Amble on the mainland, where Influenza is reported by the Medical Officer of Health to have been prevalent.

2. One case on board the St. Nicholas lightship off Great Yarmouth, from which town the man had recently come. He joined the ship on December 16th, and was ill two or three days later.

3. A light-keeper from the Eddystone Lighthouse was landed at Plymouth on January 11th, and was taken ill with Influenza on January 13th. Influenza was then prevalent in Plymouth.

4. Three light-keepers at Bardsey Island suffered from Influenza. The disease was also general among the other inhabitants of the island, having broken out among them within a few days after some of them had gone to Pwllheli, where it had been previously prevalent.

The arguments against the theory of the propagation of Influenza by communication from person to person are as follows:—

Objections to
contagion theory
considered.

1. *The disease spreads, it is said, faster than human beings can travel.*

2. *The alleged sudden commencement of an epidemic; whole populations, it is said, being struck down with it at a blow.*

Both these points have been already discussed, and I have shown that (at least as regards this country and the last epidemic) there is no evidence that the disease travels faster than human communications, and that, although the development of an epidemic may be rapid, yet it is preceded by preliminary cases from which infection may have been derived.

Mediate infec-
tion probable.

The instances of the sudden appearance of a number of cases of Influenza without any known antecedent source of infection are perhaps not more difficult to explain, on the theory of the communicability of the disease, than were some outbreaks of scarlet fever before it was known that the poison of the disease might be conveyed in milk; or of cholera or enteric fever before polluted water had been recognised as the vehicle of their respective poisons. Indeed, before Dr. Snow's observation of the association of cholera outbreaks with specifically contaminated water supplies (since supplemented by Koch's discovery of a bacillus believed to be peculiar to the disease), epidemic cholera used to be ascribed, on grounds similar to those now adduced in the case of Influenza, to the presence of a poison generally diffused in the atmosphere. It is likely that it will one day be found that the Influenza poison can live and multiply in some medium outside the human body, and that this discovery will prove the key to solve what is now mysterious in the behaviour of the disease as an epidemic.

3. *The escape of many persons who, if Influenza were communicable, might be thought likely to have contracted it.*

I have adduced facts to show that persons who have many opportunities of coming in contact with Influenza do, as a rule, suffer from it earliest and most frequently, but it must be admitted that its incidence upon persons exposed to infection (if such exist) is often very irregular.

Personal sus-
ceptibility not
universal.

Thus in a household only one member may suffer, others in attendance on the patient escaping: husbands may be attacked and not their wives, or *vice versá*. In institutions one set of inmates may be attacked and not another; thus in hospitals the nursing staff have commonly been very largely attacked, but the patients in hospital for other diseases have as a rule escaped. In one instance sailors on a troopship suffered, and soldiers escaped.

In all infectious diseases personal susceptibility is necessary to determine an attack among those exposed to infection, and this susceptibility varies in different persons, and even in the same person under different conditions and states of health. Even a disease admittedly so infectious as small-pox does not attack all who are exposed to it; thus at Sheffield Dr. Barry found that of 736 unprotected persons living in invaded houses 552, or 75 per cent., were attacked, leaving 25 per cent. who, though exposed to the disease, nevertheless escaped. Susceptibility to Influenza as to other diseases seems to vary in different families; thus in some households it has been noticed that the members of the family have escaped, while visitors and servants have been attacked, or *vice versa*. As regards the occasional escape of one of a married couple sleeping together when the other was suffering from Influenza—an occurrence frequently adduced to disprove its communicability—it must be remembered that husband and wife are never closely consanguineous, and are therefore not unlikely to inherit different degrees of susceptibility. Of the unequal incidence upon different classes of inmates in one institution, the explanation probably is that occupation may exercise some predisposing influence; thus in persons equally exposed to it the disease may be more likely to develop in those undergoing fatigue and changes of temperature than in those at rest in bed.

It has also to be added that such unequal incidence of the disease is every whit as difficult to explain on the hypothesis of its cause being in the atmosphere at large to which all persons are alike and at the same time exposed, as on that of its communicability.

4. *In many instances Influenza occurs without any source of infection from a previous case being discoverable.*

But the same thing happens sometimes with other diseases, *e.g.*, small-pox and scarlet fever, which, nevertheless, are believed to be propagated solely by infection derived directly or mediately from a previous case. Instances will no doubt occur to every investigator. Such cases are spoken of as “sporadic,” a term sometimes incorrectly used to imply an origin apart from previous cases, although properly meaning derived from seed scattered one does not know how. The botanist who is acquainted with the flora of a particular locality will sometimes observe by the wayside, or in cultivated ground, a plant of a kind never previously found there by him, but he does not therefore suppose that it has originated *de novo*, but concludes that the seed or root has somehow been introduced, although he may not be able to trace in what way.

Such casual introduction of a disease is the more liable to happen in proportion as the symptoms of the disease are likely to be overlooked. Such diseases as small-pox and scarlet fever, which have usually a conspicuous rash and other well marked symptoms, are often spread by means of the mild cases in which these characters are ill-developed, and in which the general illness is not sufficient to prevent the person going about. Other diseases again, as measles and whooping-cough, are communicable before their characteristic features appear, and when the malady appears to be no more than a common cold.

There can be no doubt that in an epidemic of Influenza, besides the well-marked cases of the disease, there are numerous mild ones—transient headaches, chills, catarrhs, feelings of lassitude, &c. which, though not presenting the clinical picture of a well-marked case of Influenza, and not compelling the patient to deviate from his usual habits, are nevertheless of the same nature.

Zuelzer (“Ziemssen’s Cyclopædia”) says: “We must call attention to the rudimentary forms (of Influenza), a great number of which are observed in every epidemic. A considerable part of the population in fact, under the influence of the ‘genius epidemicus,’ exhibits a state of

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Source of infection not always discoverable in other diseases.

Many mild unrecognised cases.

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“ indisposition, which does not amount to a full febrile affection, but
“ which is shown to be a general invasion of the system by slight
“ coryza, by confusion of the head, by one’s quickly becoming fatigued,
“ by disinclination for business, and often by sore throat, tickling cough,
“ &c.”

At St. Thomas’s Hospital, in a ward occupied by chronic cases, it was observed that the patients on one occasion during the prevalence of the late epidemic showed a marked rise of temperature, which could not be accounted for at the time, but was afterwards considered to have been due to mild Influenza.

In an asylum for deaf and dumb children at Copenhagen, in which the teachers were attacked by Influenza, but not the children, the observation was made that the growth of the latter, ascertained by systematic periodical weighings, was suspended during the period of the epidemic.

The prevalence during the time of the Influenza epidemic of obscure and indefinite indispositions and uneasy feelings in persons not obviously suffering from the disease has been frequently noted. It may be considered that persons so affected have imbibed the Influenza poison into their system, but that, whether owing to the powers of resistance of the patients enabling them to throw off the malady, or to the circumstances in which they are placed being unfavourable to its development (*e.g.*, in the case of persons kept at rest and at an equable temperature in bed), its effects are limited to producing the minor symptoms which have been mentioned. As Metschnikoff says: (“British Medical Journal,” January 31st, 1891) “Immunity (from an inoculated infectious disease) is most often only *recovery in operation from the very onset of the disease.*”

Judging from the analogy of other diseases acknowledged to be infectious, *e.g.*, small-pox, scarlet fever, or diphtheria, a person suffering from Influenza in a mild or unrecognized form is capable, on the hypothesis of the communicable nature of the disease, of giving it to others. It is possible too that, as in some other diseases, persons incubating Influenza may be capable of propagating the disease before its characteristic symptoms have manifested themselves in them. Any person therefore going about among his fellows at a time when Influenza is prevalent has therefore many chances of coming in contact with unrecognized cases of the disease.

There are also facts showing that Influenza may be conveyed by infected articles of clothing, and if so, it may in some cases be conveyed by the articles of clothing worn by a person not himself suffering from it.

Add that the infection may be conveyed, as it would seem, by letters, merchandise, &c., and that the disease may apparently be contracted by and from domestic animals, and we have in most instances a number of possible channels by which it may have been introduced without assuming that it arose otherwise than from a previous case.

As I have pointed out, the evidence tends to show that Influenza does not occur under circumstances, *e.g.*, on board deep-sea fishing smacks and lightships, in which infection from a previous case is physically impossible.

It has been suggested by Dr. Clemow* and Dr. Squire, that the Influenza epidemic may have been propagated in different modes at different stages of its course; that in the earlier stages the poison was reproduced in great measure external to the living body, and was air borne, but that in its later course the germ has been conveyed in the course of human traffic.

Supposed propagation in different ways at different stages of epidemic.

* “Public Health,” April 1890.

In regard to this it has to be observed that, however the disease in its epidemic form may have originated, we should expect to find in its place of origin and in the regions in greatest proximity thereto, the conditions most favourable for its rapid extension. That this is so seems to be shown by the circumstance that those countries, and in each country those parts, which were the first to be attacked, have usually been affected severely, while those which were reached later have generally escaped lightly. As Dr. Sykes says ("Public Health," April 1890), "The more highly infectious a disease is, the shorter the incubation period or interval of attack, and the greater the number of individuals susceptible; the more closely does the disease resemble diseases spread by atmospheric, malarial, or telluric influences." Where therefore the conditions, whatever they may be, whether atmospheric or telluric on the one hand, or connected with the physical constitution or mode of life of the inhabitants on the other, were most favourable to the propagation of the epidemic, there (on the hypothesis of communicability), a shorter or slighter exposure to infection would be sufficient to determine an attack; the persons exposed to it would more speedily succumb; and a larger proportion of the inhabitants would suffer; and where this was the case, communication would be more difficult to trace, and the more sudden and general attack of the inhabitants would make the epidemic appear with a greater show of probability to be explicable by some assumed state of the general atmosphere. The existence of such favourable conditions, whatever they may be, in the regions in which the epidemic originated, must be postulated on any theory of its origin.

Another circumstance to be taken in consideration is, that at the commencement of the Influenza epidemic observers were unfamiliar with the disease, understanding by the word "influenza" a different assemblage of symptoms. By the time that it had reached its later stages, medical men, even if they had not seen the disease, had become familiar with its symptoms by description, and hence, knowing what to expect, on its arrival recognized the early cases more readily.

In opposition to the view which has been noticed, that the communicable nature of Influenza has been more manifest towards the close of the epidemic than at its commencement, many instances are to be found among the replies from Medical Officers of Health to the Board's circular in which Influenza has been introduced into a district, and has affected persons immediately in contact with the first patient, but has not apparently spread further; the epidemic arriving later, and seemingly in a different fashion. The following are examples:—

(α) "The first cases were confined to one house isolated in the country. R. C. came from London ailing on December 22nd. He had been staying in a house in which one after another of the occupants was invalidated with what was afterwards recognized as Influenza. On December 30th, Miss H. C. failed, then another brother, an invalid, and another sister. On the 31st, the father failed, and on January 2nd, P. P. C. an officer in the army home on leave. R. C. the original importer of the malady had dined out, feeling unwell, on December 21st in London. Seven days afterwards the lady whom he took in to dinner failed with the complaint. There was no general outbreak in this town and district (*i.e.* East Grinstead) till on or about the 10th January, when it broke out in 30 or 40 houses simultaneously, and has gone on increasing until now (January 27). The general outbreak, I believe, came atmospherically, travelling up the Medway

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Instances in
East Grinstead,

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Valley from Tunbridge Wells. The villagers *en route* were attacked in correct sequence, viz., 1, Groombridge; 2, Withyham; 3, Hartfield; 4, Forest Row; 5, East Grinstead."—PERCY E. WALLIS, M.O.H., East Grinstead Urban District.

(N.B.—Dr. E. F. Fussell, Medical Officer of Health for the East Grinstead rural district, is of opinion that at Groombridge, Influenza was disseminated by the National School, where the master and a pupil-teacher were the first severe cases he could hear of.)

Lymington,

(β) "January 23rd.—Three families in the neighbourhood of Sway and Buckley have been attacked between December 30th and January 7th. All the cases were adults. All of these had recently (within a day or two) been in London. So far the disease has not spread.

"I have a number of cases in my private practice in the adjoining district of Christchurch. The origin was undoubtedly infection from two persons who came into the neighbourhood while convalescent."

February 8.—"The disease is now spreading rapidly along the south-western border of my district, probably due to infection from the Christchurch and Ringwood districts, where it was very prevalent."

February 22.—"The date of the first occurrence of Influenza was December 30th, 1889, at Sway. The disease does not appear to have spread much from this point. But within the last 10 days a wave has passed from east to west, and the illness is now prevalent over almost the entire district."—H. W. HAILFORD, M.O.H., Lymington Rural District.

Cowes,

(γ) January 18th. — "Imported from London. Spreads by direct infection, but whole households seldom affected."

February 17th.—"Is now going through households where "some weeks ago isolated imported cases occurred. Has now a more "general epidemic character."—W. HOFFMEISTER, M.O.H., Cowes.

and Mere
districts.

(δ) Mr. Bartlett, Medical Officer of Health, Mere rural district, Wilts, gives the following account of the development of the epidemic in his district:—(Three cases in one house had previously occurred in a different part of the district after the return of a convalescent from London, but the disease had not spread beyond the house.)

"The disease commenced in Maiden Bradley and Kilmington on February 6th, and rapidly spread over the rest of the district. It passed from one village to the next in a wave: a few cases appeared and soon after the disease became general. In this way its course could be traced very easily. In some houses only one member was attacked, the others escaping so far. In others one member sickened with it, and the others followed at intervals of from one to three days. Its severity differed very much even in different members of the same household."—B. P. BARTLETT, M.O.H., Mere R.S.D.

(Maiden Bradley and Kilmington are on a high plateau of greensand. They are in frequent communication on market days with Frome, where Influenza was epidemic in January.—H. F. P.)

See also Dr. Thompson's report on p. 268.

Concentration of
Influenza poison
apparently
necessary for
epidemic spread.

It would appear as if a certain degree of concentration of the Influenza poison were necessary in order for the disease to take on an epidemic form. We may compare it to a fire kindled in a pile of green wood: if

the fire be small it will die out; but if a large fire be made to burn, it will propagate itself through the green wood, first drying and then consuming it. Mr. Power has shown reason for thinking that the infection of small-pox is increased in severity when a number of acute cases are collected together, and that under such circumstances the disease has a greater power of infecting persons at a distance than an equal number of scattered cases would have. Reverting to our simile of the fire, if the wood be dry, a small flame once kindled will spread rapidly through the pile, attaining a great intensity and consuming every piece; and to this we may compare the progress of the Influenza epidemic under circumstances favourable to its extension. What all these circumstances are, we do not know, but an important one appears to be the assemblage of a large number of persons together, especially in a confined space of air. In the accounts which are given in a later part of this report of the behaviour of the Influenza epidemic in certain institutions, it will be found that in institutions such as training ships in which the whole of the inmates are brought into close association with one another, the epidemic speedily attained its full development, affected a large percentage of the inmates, and was soon over; while in prisons, in which the inmates are to a great extent secluded from one another, the progress of the epidemic was slower, and it lasted longer, although a smaller proportion of the inmates were affected. The experience of the railway companies also was that clerks and other employes working many together suffered in larger proportion than men working singly or in small detachments, and other similar observations will be found recorded among the extracts from the replies of Medical Officers of Health to the Board's queries.

In view of the circumstances,—

1. That the progress of the epidemic was contrary to the prevailing winds, and that it was independent of season or any particular kind of weather;
2. That it has not been shown to have travelled faster than human beings could travel;
3. That it has not occurred among persons placed under circumstances precluding its communication by human agency;
4. That as a general rule in each country it has appeared first in the capital, or the ports of entry, or the frontier towns in communication with countries previously invaded, and that the towns, as a rule, have been affected earlier than country places;
5. That neighbouring communities have in certain instances been affected only at considerably different dates;
6. That many instances are recorded of the disease having been introduced into a district, and spread to persons in contact with the patient, and sometimes afterwards to others;
7. That persons brought much into contact with others, *e.g.*, people going daily to business in towns have generally been the first to suffer; their households, and people locally employed, being affected later;
8. That in public services and establishments persons employed together in large numbers in enclosed spaces have suffered in larger proportion than those employed few together, or in the open air;
9. That in institutions in which the inmates are brought much into association the epidemic has more quickly attained its height, has prevailed more extensively, and been sooner over

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Reasons for
opinion of
communicability
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than in those in which the inmates are more secluded from one another;

I am of opinion that the epidemic has been propagated mainly, perhaps entirely, by human intercourse; though not in every case necessarily from a person obviously suffering from the disease. I see no sufficient ground for believing in that world-wide spread by atmospheric agencies which has been so generally assumed. I do not say that the contagium once imported into a locality may not propagate itself outside the human body in such media as damp ground or air contaminated with organic exhalations, but the fact of adjoining communities suffering at different dates seems opposed to the notion of the poison travelling far through the air. I do not find sufficient evidence that the recent epidemic has anywhere commenced suddenly with a large number of simultaneous cases, unpreceded by any previous ones, and I think that the rapidity with which Influenza develops into an epidemic may be accounted for by its short period of incubation, by the comparatively general susceptibility to the disease, and by the existence of numerous slight and unrecognised cases. I do not, however, wish to exclude the possibility that the specific germ of the disease may multiply in appropriate media, *e.g.*, in damp organically-polluted confined air, outside the human body.

Origin of disease
unknown.

C. Even if it be admitted, however, that in view of the considerations I have named, *viz.*, the shortness of the incubation period, the susceptibility to the disease of a large proportion of persons, and the existence of numerous mild and unrecognised cases, but having the potentiality of infecting other persons, the epidemic spread of Influenza may be sufficiently explained on the hypothesis of its contagious nature, we have still to account for its origin. On this point we can do little more than express our ignorance; but it can hardly be said that we are in a much better position as regards other diseases commonly present with us, and generally recognised as communicable. Some of these, as small-pox, never, so far as we know, arise otherwise than by generation from a previous case of the same disease. Others, as diphtheria and erysipelas, are believed to be the result of the invasion of the human system by organisms capable of maintaining their existence in suitable media outside the human body, and probably commonly present in many localities and harmless, but which occasionally, under circumstances not yet known, take on a parasitic habit; the disease so caused, when once started, being capable of propagation from person to person under appropriate conditions. Other diseases, again, as cholera, are endemic in certain regions, but from time to time take on an epidemic character, and spread widely over other regions, from which, in the intervals of such epidemics, they die out.

It has been suggested that, as cholera has its home in the valley of the Ganges, so in the case of Influenza, such an endemic centre may exist in Russia where, as we have seen, "la grippe" figures largely year by year as a cause of sickness and mortality. (*See p. 14.*)

Supposed
endemic in
Russia.

One view already quoted traces the origin of the epidemic to Bokhara, where it appeared in May 1889, after a succession of extreme meteorological conditions, and while the inhabitants were depressed in health owing to want of nourishment. As an endemic disease, however, "la grippe" seems to be most prevalent in the west of Russia.

Prof. Tessier, of Lyons, from his investigation in Russia, believes that Influenza is a growth of Russian soil, and when not a raging malady is a smouldering one. The way the people live in winter, locked up in heated houses; the flatness of the ground, and its consequent bad

drainage and universally sodden condition when the April thaw sets in ; the filthiness of the farmyards and village streets, and the rivers which become suddenly swollen, and on falling leave a putrid mud behind, all conduce to make Influenza endemic. Dr. Tessier believes the disease to be due to a microbe which he calls strepso-bacillus, and which is found in this mud.

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It must be admitted that conditions such as those described are by no means confined to Russia, but may be found even in villages in this country (*see* Dr. Bruce Low's notes on an early outbreak of Influenza at Langtoft, on p. 254 of this volume). If such conditions may prove a breeding ground for Influenza in Russia, it may be asked why not elsewhere ?* And why is it that Influenza prevails as an epidemic only at comparatively long and irregular intervals, and is not constantly present ? This brings us to the consideration of another view which has been propounded, viz., that the epidemic Influenza is only a development, under certain favourable conditions, the nature of which is unknown, of the ordinary catarrhs always more or less present in this and other countries, and which, when severe and accompanied by febrile disturbance, are frequently called by the name of "influenza colds"; in other words, that in the late epidemic what has spread over the world has been the predisposing condition, and not the exciting cause of the malady. In favour of this view, it may be noted that in many places in this country the advent of the Influenza epidemic was preceded by an unusual prevalence of cases of ordinary catarrh, among which were scattered, according to some observers, cases having symptoms similar to the epidemic disease. The following are instances given by Medical Officers of Health, in reply to questions of the Medical Officer's circular, viz., as to whether epidemic Influenza, characterised by much nervous depression, severe frontal headache, and various muscular pains, had shown itself in their districts.

Suggested evolution from
ordinary catarrh
of this country.

"Yes. In my first communication I said, 'No,' for while there were many colds, none appeared to me sufficiently severe to be called Influenza. Now the malady, though less frequent, is more pronounced; there are also marked secondary affections, so that I have no doubt that what was passing over us in the second and third weeks of January was a wave of Influenza in a modified form."—F. J. JOYNES, M.O.H., Dursley R.S.D.

"A number of instances with these febrile symptoms; but many others might be classed as ordinary epidemic catarrh." — W. ALLARD, M.O.H., Tewkesbury.

Other Medical Officers of Health distinguish the cases of epidemic Influenza from the prevalent common catarrhs, by which they were preceded or accompanied. The following are instances :—

"There have been two distinct conditions prevalent during the past ten days (*i.e.*, before January 18): one a catarrh of more than usual severity which I attribute to climatic conditions; the other characterised by gastric pain, vomiting, severe supraorbital, temporal, and occipital neuralgia, pains and aching in limbs, cold shiverings, and, in some cases, slight delirium. These symptoms last two or three days, and are followed by great depression and bodily weakness. I attribute these symptoms to a miasma. They attack whole families indiscriminately, and often at the same time,

* Against the view that such conditions play a part in generating Influenza is the circumstance that epidemic Influenza as a rule prevails first and most severely in towns and not in country places. Sanitary conditions (except overcrowding and want) appear to have little influence over it.

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or within a few hours of each other. I have noticed this malady more particularly in the higher parts of the district, the valleys and lower parts being only slightly affected. It affects all sorts and conditions of men, women, and children."—W. MOXON, M.O.H., Matlock and North Darley U.S. Districts.

Dr. Ward, Medical Officer of Health of Harrogate, reports on January 18th a prevalence of "Influenza," not characterised by much nervous depression, frontal headache, or muscular pains, but specially by bronchitis, congestion of the lungs, and pneumonia. It was first noticed about the beginning of November, and had been more prevalent with the special characters mentioned since November 25. It was preceded by an extensive epidemic of measles of mild type, and was decidedly infectious. On February 22nd, however, he reports that a great deal of Influenza with the special characters of the epidemic disease, had occurred within the last ten or fourteen days. It was probably imported from Leeds and London, and certainly spread by infection.

"An epidemic popularly termed 'Influenza' prevailed in certain school districts, notably in Pleshey and Great and Little Waltham, during the months of November and December 1889. It first appeared among the children at Pleshey school on November 18th, and by November 30th had reduced the attendance about 50 per cent. Two-thirds of the whole children in the village were attacked within a month, and the disease spread into the surrounding parishes. Four or five deaths certified as being due to bronchitis or broncho-pneumonia resulted from this visitation. I am inclined to think that cases of a similar nature occurred in December around Maldon. The symptoms were those (so far as I have yet gathered) of a 'common influenza cold,' but children were almost solely attacked, few or no adults being affected. Dr. Cockey, who attended many of the serious cases, agrees with me that the disease was distinctly epidemic, and allied to, yet distinct from, the more recent epidemic. The epidemic of Influenza which affected the whole district in January 1890, was at Pleshey entirely confined to the adult population, few or no children being affected; but at Great and Little Waltham over 50 per cent. of the school children were attacked with Influenza in January 1890."—J. C. THRESH, M.B., D.Sc., M.O.H., Chelmsford and Maldon R.S.Ds.

It must be admitted that our knowledge of the etiology of even a common catarrh is not entirely satisfactory. Other local irritants besides exposure to cold will cause a condition of catarrh or superficial inflammation of the mucous surfaces, and if the inflamed surface be extensive, this may be accompanied by marked feverishness, chilly feelings, &c. In certain seasons catarrhs are very prevalent; but these are by no means necessarily very cold ones; they are often marked by mild damp changeable weather. There is a popular belief that "colds are infectious" and "run through a household." Certainly several members of a household often suffer from catarrh at the same time, but it is difficult to exclude the influence of exposure to common conditions.

Dr. M. T. Sadler (Catarrhal Fever, "Lancet," July 14th, 1888) considers that there is distinct evidence that ordinary febrile catarrh is infectious, and that cases of bronchitis and pneumonia and diarrhoea are often associated with catarrh in other members of the household.

The clinical characters of epidemic Influenza, however, seem opposed to the view that it is only a highly developed form of ordinary catarrh. As Dr. Gairdner says, it is a specific fever, and not a catarrh, and during

the late epidemic the most prominent symptoms have been those of the nervous system; catarrh of the mucous membranes being commonly but slight or absent.

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D. The Influenza epidemic was preceded or accompanied in London, Cornwall, Staffordshire, and other places by a prevalence of a disease known as "influenza," or "pink eye" among horses, especially affecting those in large stables where many horses are kept together. In London this epizootic preceded the Influenza epidemic by about six weeks. In other places, however, the disease among horses followed the epidemic among human beings, *e.g.*, at Newcastle-on-Tyne where it was prevalent in a very virulent form in October and November, 1890.

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"Influenza"
among horses;

Prof. G. T. Brown states ("Journal of the Royal Agricultural Society," 1890), that horses suffer more or less from "influenza" almost every year, and asserts that the outbreak among horses in this country in the autumn and winter of 1889 was in no way remarkable in comparison with previous great outbreaks in past years. It raged with more or less virulence in 1850, 1863-4, 1871-2, 1881 and 1883;* years in which there was no human epidemic. The symptoms of "influenza" in the horse closely resemble those of the human disease; and other points of resemblance between the two diseases are, that the treatment found most beneficial in both is of a supporting character, with rest and warmth, under which a fatal termination rarely occurs; and that veterinary opinion, like medical, is very unsettled as to the pathology and etiology of the disease, some veterinary surgeons holding it to be contagious, others the reverse.

By some veterinarians again it is held that, under the name of "influenza" in horses, more than one disease is comprised. Thus Prof. Csokor of Vienna ("British Medical Journal," March 29th, 1890, page 747) says, that under this name are comprised two morbid processes, which are clinically and anatomically quite different from each other. The true equine "influenza" (*Pferdestaupe*) is very infectious, and is transmissible to dogs, and even to man. The infectious matter is unknown, but exists probably in the excrement; it is volatile and transmissible by the air. The disease sets in with high fever, great depression, and muscular weakness; colic and diarrhoea are occasionally observed, and there is invariably inflammation of the structures of the eye. The second form of equine "influenza" (*Brustseuche*) is essentially a contagious pneumonia, and its infective agent is a capsulated coccus, different from the pneumo-coccus of man.

Prof. Bollinger of Munich ("British Medical Journal," February 8th, 1890, p. 323) recognises three forms of Influenza in the horse. First, the catarrhal, which affects the mucous membrane of the respiratory tract,—nose, larynx, trachea, and bronchi,—and may become dangerous through being complicated with capillary bronchitis and broncho-pneumonia. Secondly, epidemic erysipelas of the horse (also called *Rothlaufseuche* and "horse typhoid"), characterised by affection of the digestive organs and by the formation of petechial and erysipelatous swellings under the skin and intestinal mucous membrane. It spreads rapidly by contagion, but is relatively benign. The symptoms are high fever, severe nervous depression, drowsiness, and great muscular weakness. Gastric symptoms, conjunctivitis, and erysipelatous swellings of the chest, abdomen, and limbs are also observed. The duration of the

* "Veterinary Record," Feb. 1, 1890. In 1872-3 a great epizootic of "influenza" among horses spread over the whole of North America: 90 per cent. of the animals in some places were affected, and 3 to 4 per cent. died, but there was no similar epidemic at that time among human beings.

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affection averages one week, but may extend over two or three weeks. It is by some considered a form of anthrax, and anthrax bacilli have occasionally been discovered in the blood and tissues. Thirdly, "Pectoral influenza" (*Brustseuche*, contagious pleuro-pneumonia of the horse) is "influenza" in the old and large sense. The infectious substance consists of diplobacteria, which when inoculated in mice produce fatal septicæmia. In fatal cases a malignant gangrenous pleuro-pneumonia is found. The disease prevails enzootically in large stables. Of these three forms, Prof. Bollinger believes that only the catarrhal form is related to human Influenza; the erysipelatous and pneumonic forms, which are very frequent in army horses, being never communicated to man.

Relation with
human disease.

Veterinary opinion in this country seems to incline to the view that "influenza" in the horse and in man, though resembling each other, are distinct maladies, and are not communicable from one subject to the other. In some large establishments in London in which the horses suffered from "influenza" in the autumn of 1889, it was not found that the stablemen were the first to suffer, or were specially affected in the human epidemic which followed.

In some notes on Horse-influenza, by Dr. Bruce Low, in Chapter X. of this report, several instances are quoted of the apparent communication of "influenza" from horses to human beings, and *vice versa*, and other instances are given by other observers.

It would appear probable from Dr. Bruce Low's notes that the "influenza" among horses, which prevailed in England at about the time of the human epidemic, has comprised more than one of the forms recognised by the continental authorities above quoted, and if so, this may be the explanation of the discrepancy between different observers as to the communicability of the disease from horses to men, and *vice versa*.

The considerations—

1. That "influenza" among horses has frequently prevailed at times and places when there has been no human epidemic;
2. That in the late epidemic persons having to do with horses were not observed to be specially or earliest affected; and that cases of apparent transmission of the disease from the horse to man were of somewhat rare occurrence;
3. That in many places where the late Influenza epidemic prevailed (*e.g.*, at Newmarket. See County summaries, p. 131), the absence of any similar disease among horses, was affirmed;

appear to me inconsistent with the hypothesis that the epidemic Influenza in 1889-90 had its origin in the "influenza" of horses.

It has been suggested that although the human and equine maladies may be distinct, yet that both may have been due, or may have had their extension alike favoured by, some unknown atmospheric conditions. The first and third of the above considerations, however, seem opposed to this view, though doubtless the same weather conditions may give rise in both horses and men to an ordinary catarrh (which, when severe, is often called "influenza" in both).

Domestic
animals appa-
rently affected.

In many places where Influenza has been epidemic, domestic animals, especially those living indoors, as pet dogs, cats, and caged birds, have been noticed to be concurrently affected with symptoms resembling those of Influenza or of catarrh, and in a few instances (Brentwood, Bromsgrove, Cardigan) a cat was thus affected shortly before the members of the family were attacked with Influenza.

It has been suggested that migrating birds may have brought the specific poison of Influenza from the continent to this country. Some

inquiries made in this direction by Dr. Bruce Low are mentioned in his notes (p. 241), but have not yielded any definite results.

E. A suggestion was made that the infection of Influenza might have been brought into this country through the medium of Russian oats, and that thus the epidemic affected horses consuming them, and afterwards spread from them to human beings. In reference to this I had an interview with Mr. J. Aste, the chairman of the Corn Exchange, who kindly gave me the following information respecting the trade in Russian oats. Mr. Aste says that a large proportion of the oats used in this country, especially in London and the south of England, are of Russian origin, but that in the winter of 1889-90 the proportion was larger than usual owing to the failure of the Swedish crop. Comparatively few oats come to London from Scotland or from other countries. He says, that the 1889 crop would begin to arrive in London in October of that year, but that none would come from St. Petersburg later than the first or second week in November owing to that port being closed with ice. Other Baltic ports, however, as Libau and Revel, are always open, except in very severe winters. Archangel is closed from September to May. Few oats comparatively come to this country from the Black Sea ports. The oats are grown up the country, but Mr. Aste could not tell me anything as to the Russian mode of thrashing and handling them. They are brought to St. Petersburg and Riga by barge and rail, and to other ports by rail. Barges holding 700 or 800 tons are loaded during the winter in the eastern provinces and brought to St. Petersburg when the ice melts. They are conveyed in bulk or in mat bags. Mr. Aste thinks that Russian oats are little likely to be used in the rural parts of Lincolnshire and Yorkshire where the earliest reported outbreaks of Influenza occurred, as these districts grow more than sufficient oats for their own consumption. He does not think that corn merchants were specially early or numerous attacked with Influenza. (In a case mentioned in Dr. Thompson's report, on p. 270, a cornhandler was thought to have contracted Influenza from handling Russian oats.)

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Suggested in-
troduction by
Russian oats.

Sanitary conditions do not seem to have had any influence in determining the occurrence of Influenza, and what share they have had in determining its extent or fatality cannot yet be decided. On the occasion of the last great epidemic, Dr. Peacock concluded, "The more common predisponents to disease, *e.g.*, defective drainage, want of cleanliness, overcrowding, impure air, deficient clothing, innutritious or too scanty food, powerfully conduce to the prevalence and fatality of Influenza." And Dr. Farr showed ("Vital Statistics," p. 333), that in the last six weeks of 1847, while in the least unhealthy districts of London the annual rate of mortality was raised from a mean rate of 20 per 1,000 to 38, in the unhealthiest districts it was raised from a mean rate of 27 to 61.

Influence of
sanitary condi-
tions.

That overcrowding and impure air must have a powerful influence in aiding the development of the epidemic follows from what we have seen of its greater prevalence among persons associated together in a confined space; and though rich and poor have alike been sufferers from the epidemic, and even royal personages have been fatally attacked by it, it cannot be doubted that poverty must have in many cases conduced to a fatal issue in persons who, if placed under more favourable circumstances, might have recovered, seeing that it often involves not only inferior conditions of lodgment, but also want of appropriate food, of sufficient warmth and clothing, and of ability to take the needed rest.

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That conditions, such as drainage and water supply, more under the control of sanitary authorities, have had any influence upon the extent or severity of the epidemic is more doubtful. Many observers say that they have not.

By some Medical Officers of Health it has been thought that low-lying damp localities were most affected, but others state the reverse, while others again state that high and low-lying localities have been alike affected. Brattanich ("Dublin Journal of Medical Science," August 1890, p. 152), from observations in the district of Podersam, Bohemia, is of opinion that the situation of a given place is in itself without significance as regards the occurrence of Influenza; not so, however, for its mode of propagation. In districts with extreme dampness of soil the disease attacked at one blow a relatively large number of the inhabitants, while in drier localities the disease spread only very gradually, and a very high-lying locality on rock remained exempt. This does not seem, however, to have entirely held good in this country, for some high-lying localities, *e.g.*, the villages of Monkton Farleigh, Maiden Bradley, and Kilmington, on the borders of Wilts and Somerset, on high plateaux of oolite and green sand, have been reported to have been severely affected.

The apparent progressive diminution in the severity of Influenza epidemics in this country, as well as of their frequency, and also the comparative lightness with which this country has suffered, as compared with some continental ones, may perhaps be held, without undue self-laudation, to be connected with our present better sanitary condition as compared with former times and other places, though possibly improved medical treatment may have had much to do with it, especially considering the prevalence in earlier times of the practice of bleeding, a practice which in the later of the previous epidemics became generally acknowledged to be hurtful in Influenza.

In the year 1890, 638 deaths in London were ascribed to Influenza, while in the six months October 1st, 1847, to April 1st, 1848, the deaths registered from Influenza were 1,739 in a smaller population. The excess of total deaths during the epidemic period, above the average, was 5,000 in 1847-89, 2,258 in 1890.

In 1847, Dr. Peacock estimated that one-fourth of the population of London were affected; in the late epidemic I think it likely, from the figures discussed on the next pages of this report, that the proportion affected was not nearly so large among the general population. In 1837 it was estimated that half the population of London were attacked, and in 1782 the proportion attacked in some places was set down as high as three-fourths or four-fifths of the whole.

How far these favourable comparisons may have to be modified owing to the recent recurrence of epidemic Influenza in 1891 time must show.

V.—EXTENT AND FATALITY.

There appears to be no doubt that as compared with many countries on the continent of Europe, England experienced the Influenza epidemic of 1889-90 comparatively lightly. Although at the height of the epidemic the number of persons disabled was sufficiently large to cause serious inconvenience, yet there was at no time any serious disorganization of the public services, such as was reported to have been caused by the epidemic in some continental countries.

The following estimates have been given of the proportion of the inhabitants attacked by Influenza in certain foreign countries and cities :—

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Extent of epi-
demic abroad

Country.	Per cent.	Country.	Per cent.
St. Petersburg - - -	50	Vienna - - -	30-40
Berlin - - -	33	Belgrade - - -	33
Nuremberg - - -	67	Antwerp - - -	33
Grand Duchy of Hesse - -	25-30	Gaeta - - -	50-77
Do. other districts - -	50-75	Massachusetts - - -	39
Heligoland - - -	50	Pekin - - -	50
Buda-Pesth - - -	50	St. Louis, Mauritius - -	67
Portugal - - -	90		

In one district in Ceylon 89 per cent. of the population are estimated to have suffered.

Such estimates of the proportion of the inhabitants attacked are, no doubt, very untrustworthy, and liable to exaggeration, especially in a time of panic. For institutions and public services more exact figures can often be given, but upon persons living massed together the incidence of Influenza is greater than upon the general population.

Again, different parts of the country have suffered in different proportions, so that an estimate based on London experience would probably give an exaggerated idea of the extent of the epidemic in the country at large.

The following are examples of the extent of Influenza prevalence in certain large establishments in and near London :—

and in this
country;
at London,

—	Per cent.	—
General Post Office* - - -	33·6	
Bank of England - - -	20·8	
London and Westminster Bank - -	21·0	
London and North-Western Railway, Secretary's Department.	23·8	
Great Northern Railway (south of Hatfield) -	12·8	
Great Eastern Railway - - -	13·8	
Darenth Asylum - - -	10·4	Staff and inmates.
Do. Imbecile Schools - - -	13·6	Do.
Wormwood Scrubs Prison - - -	12·3	Do.
Wandsworth Prison - - -	18·2	Do.
Pentonville Prison - - -	8·4	Do.
Customs officers - - -	11·0	
Troops in Home District - - -	9·3	
Royal Gunpowder Factory, Waltham Cross -	25·0	

* The facilities in the General Post Office for obtaining medical advice (see p. 179) may partly account for the large proportion of cases among the staff there,—light cases being recorded, of which elsewhere notice would not be taken.

In certain reformatories, industrial schools, and training ships the per-centage attacked was higher, reaching from 50 to 75 per cent. These, however, cannot fairly be taken as an index to the prevalence of Influenza among the general population. Using the above figures as the basis of a rough guess, we may estimate that the proportion of persons in and near London disabled by Influenza was about 25 per cent., or 1 in 4, among those employed in large offices, and about $12\frac{1}{2}$ per cent., or 1 in 8, among those employed out of doors. If the Army returns may be taken as a criterion the proportion of cases was smaller among women and children than among men, but in some elementary day schools in Dr. Thresh's district in Essex the proportion of children absent from school through the Influenza epidemic was as high as 50 per cent.

The only figures which I have as to the average duration of disablement occasioned by an attack of Influenza are the following:—

Custom House officers	-	15·0	days per case.
Bank of England	-	9·4	„ „
London and Westminster Bank	-	9·4	„ „
Great Northern Railway (Traffic and Goods Departments)	-	7·0	„ „
Navy*	-	4·5	„ „

Taking 10 days as the average duration of a case, the loss of working power occasioned by the Influenza epidemic in and near London may be roughly estimated as from one to three days for each individual of the whole population.

and in kingdom
generally.

For the kingdom generally these figures will probably be too high, as the epidemic of 1890 was much less severe in the north of England than it was near London. In the Locomotive Department of the Great Northern Railway the table on page 199, which embraces the period to the end of February, and includes the northern sections of the line, shows that 17 per cent. of the staff in the London district were disabled, while over the whole line the per-centage was only 6·5.

The Army returns show a total per-centage affected for the United Kingdom of 6·2 and the same for England and Wales; but the per-centage varied from 10·3 in the Eastern district and 9·3 in the Home district to 3·8 in the Western district and 1·6 in the North-eastern and North-western districts, which comprise the populous towns of the Midlands and North of England.

The following are some instances of local estimates of the extent of incidence of the Influenza epidemic:—

Penzance.—Two-thirds of population estimated to have suffered.—G. B. MILLETT, M.O.H.

Coventry.—40 per cent. of population probably affected.—M. A. FENTON, M.D., M.O.H.

Thetford Rural District.—Population 13,598. The medical officer of health gives for five weeks the number of cases which have come under medical observation: they amount to 1,010. These, he says, represent probably only about 70 per cent. of the cases that have occurred. If so, the total cases would be 1,450 or 10·7 per cent. of the population.

Lymington.—One-third of school children now suffering.—J. RENDALL, M.O.H.

* The short average duration of disablement in the Navy is accounted for by the circumstance that a considerable number of sick—394 out of 4,626 cases, these no doubt comprising many of the more severe and protracted ones—were sent for treatment to hospitals on shore. I am informed also by Dr. Blaxall that a seaman is often placed on the sick list for an indisposition so slight that it would not deter a civilian from going about his ordinary avocations.

Newport, Isle of Wight.—Out of 500 Oddfellows 100 were incapacitated for work for an average period of two weeks.—F. B. LUTTRELL, M.O.H.

Melton Mowbray, R.S.D.—75 per cent. of inhabitants fell victims to the disease.—W. TIBBLES, M.O.H.

Nottingham.—1,918 cases among 8,374 employés in various occupations = 22·9 per cent.—P. BOOBYER, M.O.H.

The following table (for which the Board are indebted to Mr. A. H. Snee, medical officer to the Gresham Life Assurance Company, an office doing a large business on the continent as well as in this country) gives some idea of the relative frequency and severity with which, in the different countries, persons of a class to insure their lives have suffered from Influenza. The table shows in each branch, first, the number of policy holders and the deaths among them from Influenza up to March 24th, 1890, and second, of the number of persons newly assured between January 1st and March 31st, 1890, the proportion who had recently suffered from Influenza. Excluding branches in which the numbers are small, there seems to be some sort of proportion between the mortality and sickness rates in the different countries; thus, both are somewhat higher in France, Bavaria, and Italy than in England, and higher still in Belgium and the Rhine provinces.

The ages of the deceased were as follows:—

Age 29 and under	40	-	-	-	-	6
" 40	" 50	-	-	-	-	13
" 50	" 60	-	-	-	-	17
" 60	" 70	-	-	-	-	14
" 70	" 80	-	-	-	-	4
Over 80	-	-	-	-	-	1

The average age at death was 53·9 years.

Branch.	Country.	Deaths from Influenza among Assured Persons.			Number of New Policies issued since January to 1890.	Number of newly Assured who had recently had Influenza.	Per cent.
		Policies.	Deaths.	Per 1000.			
A	England - -	13,167	9	0·69	695	88	12·68
B	France - -	6,520	11	1·77	388	54	13·91
C	Belgium - -	1,831	6	3·34	76	17	22·35
D	Rhine Provinces, Mannheim.	1,871	11	5·88	5	1	20·0
E	Bavaria - -	1,508	3	1·99	23	4	17·39
G	Slip, no business, Switzerland.	413	7	17·0	—	—	—
H	Hungary - -	8,191	9	1·11	727	57	7·84
I	Italy - -	4,577	5	1·14	431	80	18·56
K	Slip, Austria and Hungary, antecedent to 1870.	1,265	2	1·58	—	—	—
M	Holland - -	268	—	—	4	2	50·0
N	Slip, Egypt - -	94	—	—	—	—	—
Q	Austria - -	6,118	8	1·31	479	41	8·56
R	Spain - -	130	—	—	20	2	10·0
S	Saxony - -	625	—	—	33	3	9·09
T	Hamburg - -	285	—	—	23	2	8·69
—	South Africa -	—	—	—	130	5	3·84
	Total - -	46,863	71	1·51	3,034	356	11·73

Mr. Snee believes that over 8 per cent. of the total population of Europe have been attacked. He estimates that in England the insurance com-

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Among persons insured in Gresham Company;

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panies and friendly societies paid not far short of 1,000,000*l.* on account of the increased mortality and sickness caused by the Influenza epidemic of 1889-90, and that the loss by loss of wages and disorganization of business cannot be much less than another 1,000,000*l.*

The following extract is taken from the report of the Hearts of Oak Benefit Society, for 1889, for which I am indebted to Mr. Thomas Marshall, secretary:—

in Hearts of Oak
Benefit Society.

“Although the serious Influenza epidemic through which we are now passing does not properly belong to the history of the year 1889, we shall perhaps be expected to refer to the subject in this address. The epidemic came upon us, almost suddenly, in the week ending January 11th. The following figures show the number of new cases of sickness from all causes during each of the weeks named, the total number of claimants of sick pay at the end of each week, and the amount disbursed for sick pay in town and country. The amount spent during the same period in 1889 is also shown, and if we disregard, for the moment, the increase of the society during the interval, we may say that the epidemic appears to have cost us, up to the present time, about 17,600*l.*:—

“NUMBER OF NEW CASES (all kinds).

Week ending	1890	1889
January 11, 1890	3,808	Week ending February 1 - 2,013
“ “ 18	3,305	“ “ 8 - 1,877
“ “ 25	2,448	“ “ 15 - 1,698

“NUMBER CLAIMING SICK PAY (from all causes).

1888.		1889.	
Week ending December 27	- 2,989	Week ending December 26	- 3,391
1889.		1890.	
Week ending January 3	- 3,411	Week ending January 2	- 4,137
“ “ 10	- 3,875	“ “ 9	- 6,473
“ “ 17	- 3,999	“ “ 16	- 8,715
“ “ 24	- 3,964	“ “ 23	- 9,024
“ “ 31	- 3,913	“ “ 30	- 8,442
“ February 7	- 3,924	“ February 6	- 7,640
“ “ 14	- 3,896	“ “ 13	- 7,017

“SICK PAY DISBURSED.

Week ending	1889.	1890.
January 10 - - - -	£ 2,777	£ 4,197
“ 17 - - - -	2,906	6,077
“ 24 - - - -	2,784	6,699
“ 31 - - - -	2,810	6,103
February 7 - - - -	2,771	5,674
“ 14 - - - -	2,779	5,101 ”

The number of members at the end of 1888 was 122,942; at the end of 1889, 130,991. Taking the number of new cases in the week ending February 15th, 1890, as the normal weekly number for the time of year and all in excess of this as due to the Influenza epidemic, we have in the five weeks ending February 8th, 5,961 cases of Influenza, or 4.5 per 100 members. It is likely, however, that this number is under the mark, for it will be observed that the number of members claiming sick pay in each of the weeks ending respectively December 26th, 1889, and January 2nd and 9th, 1890, was above the number for the corresponding week of the previous year.

The mortality in London in 1890 ascribed directly to Influenza has been 648 deaths, or at a rate of 146 per million of the estimated population. These 648 deaths were distributed through the several weeks of the years as follows:—

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Mortality in
London,
direct

LONDON.—DEATHS from "INFLUENZA" in 1890.

First Quarter.		Second Quarter.		Third Quarter.		Fourth Quarter.	
Week ending	Deaths.	Week ending	Deaths.	Week ending	Deaths.	Week ending	Deaths.
Jan. 4-	4	Apr. 5	10	July 5	2	Oct. 4	2
" 11-	67	" 12	7	" 12	1	" 11	2
" 18-	127	" 19	9	" 19	1	" 18	1
" 25-	105	" 26	6	" 26	1	" 25	—
Feb. 1-	75	May 3	2	Aug. 2	3	Nov. 1	2
" 8-	38	" 10	3	" 9	1	" 8	2
" 15-	30	" 17	2	" 16	1	" 15	6
" 22-	24	" 24	1	" 23	1	" 22	3
Mar. 1-	23	" 31	1	" 30	1	" 29	2
" 8-	24	June 7	3	Sept. 6	—	Dec. 6	1
" 15-	11	" 14	—	" 13	1	" 13	1
" 22-	17	" 21	2	" 20	1	" 20	1
" 29-	13	" 28	1	" 27	2	" 27	3
						Jan. 3, 1891	1
Total	558	Total	47	Total	16	Total	27

On reference to the table B. given on an early page of this part it will be seen that the mortality ascribed directly to Influenza during the late epidemic has been much less than that in the last previous great epidemic, on which occasion in London, with its then much smaller population, 1,161 deaths from Influenza occurred in the last quarter of 1847, and 578 in the first quarter of 1848.

The mortality ascribed directly to Influenza is, however, but a small part of that occasioned by the presence of the epidemic. During the four weeks ending January 25th, 1890, which may be taken as the period over which the epidemic lasted, the deaths registered in London, and indirect.

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from all causes taken together were considerably above the average, the excess being as follows:—

In the week ending January 4	-	423	deaths above the average.
„	„	11	„
„	„	18	„
„	„	25	„

Giving a total in the four weeks of 2,258 deaths above the average numbers registered in the corresponding weeks during the previous 10 years. This excess is equal to a rate of 6,638 per million inhabitants per annum. In the week ending February 1st the total deaths in London had fallen to 211 below the average, although, as already shown, the deaths ascribed to Influenza were still numerous, and continued so till the end of the quarter. The explanation is probably that the later deaths ascribed to Influenza were due for the most part to sequelæ or complications occurring at a late stage in the case, whereas the influence of the presence of the Influenza poison in turning the scale against persons ill of other diseases would be greatest when the epidemic was at its height.

The principal causes contributing to the excess of deaths in the four weeks ending January 25th, 1890, were as follows, the numbers given being the aggregate number in excess of the deaths from the same cause registered in the corresponding period of the previous 10 years:—

Cause.	Excess over Average.
Influenza - - - - -	302
Whooping-cough - - - - -	64
Phthisis - - - - -	337
Bronchitis - - - - -	911
Pneumonia - - - - -	465
Other diseases of respiratory organs	78
Diseases of circulatory system	318
Alcoholism - - - - -	49

The greatest excess of deaths from bronchitis and diseases of the circulatory organs occurred in the week ending January 11th; that from Influenza, phthisis, and pneumonia a week later, viz., in the week ending January 18th.

The deaths from phthisis continued somewhat above the average until the middle of March, but those from bronchitis and pneumonia fell below the average in February.

In 1847-8 an excess of deaths above the average was observed during the period of the epidemic, not only from pulmonary and cardiac affections and whooping-cough, but also from "typhus," measles, scarlet fever, laryngeal diseases, erysipelas, rheumatism, cerebral diseases, and childbirth.

For the other large towns and for the kingdom generally similar figures cannot be given until the Registrar-General's Report for 1890 is published.

In rest of king-
dom.

Town.	Recorded Date of Influenza.		DEATH-RATE per 1,000 (ESTIMATED) POPULATION per Annum in Weeks ending																
			1889.				1890.												
	First Cases.	Epidemic began	Dec. 7.	Dec. 14.	Dec. 21.	Dec. 28.	Jan. 4.	Jan. 11.	Jan. 18.	Jan. 25.	Feb. 1.	Feb. 8.	Feb. 15.	Feb. 22.	Mar. 1.	Mar. 8.	Mar. 15.	Mar. 22.	Mar. 29.
Birkenhead	-	-	14.2	23.9	14.8	20.4	16.4	17.4	17.9	17.9	18.4	19.4	23.8	19.9	22.3	22.8	14.4	18.4	19.4
Birmingham	December 23 (?)	Dec. 30 (?)	18.9	19.2	26.3	20.4	23.5	24.5	27.4	22.9	26.5	26.1	30.6	27.0	23.1	27.8	23.8	21.0	22.4
Blackburn	Reported absent	-	25.0	32.8	33.6	31.4	31.7	21.9	24.9	21.5	27.0	23.2	23.2	30.4	36.3	38.8	35.9	28.3	27.9
Bolton	-	February 15	19.1	30.0	33.2	21.8	31.1	21.2	24.8	23.9	20.7	20.7	33.8	30.6	43.7	40.1	37.8	26.6	19.4
Bradford	January 3	?	24.2	27.1	23.3	19.3	25.4	24.1	20.2	19.5	22.8	23.2	22.3	30.6	34.9	32.7	24.1	24.1	24.9
Brighton	January 1	January	16.7	18.0	14.1	20.1	18.1	18.1	15.6	20.2	24.5	22.8	22.8	14.8	18.1	20.7	20.7	17.7	28.7
Bristol	January 4	-	19.8	20.5	23.4	21.4	26.3	23.8	25.8	27.2	26.5	34.8	37.5	25.6	27.2	26.5	26.0	24.2	19.1
Cardiff	First week, January	January 8	25.5	24.5	21.8	19.0	24.1	23.2	18.3	21.4	19.2	22.7	24.5	18.7	16.5	19.2	20.9	23.6	20.9
Derby	Middle February	-	30.7	18.0	28.1	26.0	22.2	27.4	17.6	15.0	17.1	18.6	21.7	18.6	24.8	22.2	24.8	17.1	21.7
Halifax	February 12	February 16	24.5	30.2	22.5	23.2	22.2	19.1	21.0	24.8	19.1	22.2	26.7	29.2	29.9	35.0	29.9	26.1	23.5
Huddersfield	Reported absent	-	29.8	25.3	20.8	18.5	16.6	23.8	18.8	17.7	23.8	19.9	26.0	24.9	26.6	28.2	20.5	24.3	20.5
Hull	December 16	January 18	26.8	23.8	25.1	25.3	24.6	24.6	21.5	27.1	23.7	20.5	25.1	23.9	21.5	22.7	22.2	25.1	23.7
Leeds	December, end	January, end	25.4	27.0	24.8	25.8	27.1	29.0	26.1	27.1	24.7	25.5	30.1	29.4	36.5	29.5	27.4	26.2	22.6
Leicester	January 14 (?)	January 6	18.0	19.4	17.0	19.4	14.5	21.3	17.2	20.3	19.9	16.6	24.7	23.3	17.9	22.6	20.3	14.5	22.6
Liverpool	December 23	January 13	23.0	25.4	27.6	26.7	27.5	24.7	25.2	22.9	22.8	27.6	31.0	30.2	29.5	30.9	26.0	23.2	22.3
London	Oct. 13 (?). Beginning of December. Oct. (?)	January 1	20.2	21.2	21.8	20.3	28.0	32.4	32.1	26.3	21.8	20.6	21.3	21.8	21.3	22.3	20.9	19.3	18.5
Manchester	December	February(?)	27.3	31.1	32.1	26.6	32.8	33.8	28.4	26.9	29.3	30.4	38.6	35.3	40.8	45.6	35.9	30.5	31.9
Newcastle-on-Tyne	December 15	January 13	22.4	28.2	27.6	26.6	25.0	28.5	27.2	29.1	25.9	29.1	28.2	25.9	28.5	29.4	29.4	24.3	28.8
Norwich	January 8, in barracks	-	23.2	17.1	24.8	11.6	19.7	19.7	20.2	15.9	21.9	30.6	24.1	26.8	29.0	25.2	24.1	16.4	26.2
Nottingham	December 28	January 18	17.3	20.4	18.9	16.9	17.7	19.4	14.9	16.8	14.5	19.4	24.1	25.1	21.3	21.9	19.4	19.6	17.9
Oldham	December, end	January 20	19.1	31.9	24.9	22.7	19.9	24.2	14.9	23.5	21.7	24.9	30.9	33.4	30.9	26.3	19.2	27.4	21.3
Plymouth	December 9	January 5	36.7	34.7	27.4	28.7	26.5	30.4	21.2	20.5	28.5	25.8	34.4	23.8	23.8	31.1	27.1	21.2	21.8
Portsmouth	December 9	January 8	19.2	25.9	22.5	25.1	28.5	20.4	22.6	25.5	20.1	29.9	23.0	24.1	22.3	22.6	21.2	25.9	20.8
Preston	January 18, about	-	26.5	26.0	26.5	27.0	32.2	23.8	25.8	27.8	24.3	26.8	27.8	37.7	43.3	38.7	27.8	25.8	23.3
Salford	December, middle	Feb. begng.	21.6	22.0	21.4	24.5	22.6	19.8	20.9	18.9	21.3	23.0	26.0	28.0	28.8	33.1	22.4	22.8	26.7
Sheffield	First week, February	Mid. Feb.	21.2	23.1	24.6	21.5	24.4	26.6	23.5	21.0	26.2	23.2	27.3	32.0	35.1	38.7	33.4	28.0	29.3
Sunderland	December 16	January 9	21.8	28.8	21.8	24.1	21.8	26.4	20.3	18.3	28.6	25.6	27.5	26.0	26.4	24.4	26.4	18.3	21.8
Wolverhampton	December 24	-	28.4	20.2	30.3	25.3	28.1	19.4	21.9	25.6	23.1	25.6	33.1	33.8	35.6	39.4	21.9	28.8	19.4

Figures underlined mark periods of high mortality, probably due to Influenza epidemic.

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The preceding table gives the death-rate week by week in the 28 largest towns of England and Wales, in December 1889, and January, February, and March 1890, with the date of commencement of the epidemic so far as known. Any noteworthy increase of mortality apparently due to the Influenza epidemic is indicated by underlining the figures in the weeks during which it occurred; but the large northern and midland towns of England were but lightly affected with the Influenza epidemic (some indeed are reported to have escaped), and any increase in the death-rate due to its presence is liable to be obscured by fluctuations due to other causes.

The following figures are given by local registrars of births and deaths in footnotes in the Registrar-General's return for the first quarter of 1890.

District.	Sub-District.	Population 1881.	Deaths from Influenza.
Strood - - -	Northfleet - - -	12,768	6
Medway - - -	Gillingham - - -	42,298	6
Edmonton - - -	Edmonton - - -	23,463	14
Wellingborough - - -	Higham Ferrers - - -	10,790	13
Bath - - -	Lyncombe - - -	12,277	6
Do. - - -	Batheaston - - -	7,763	5
Barton Regis - - -	St. George - - -	26,433	6
Hull - - -	Myton - - -	67,470	16
Merthyr Tydfil - - -	Aberdare - - -	38,137	5
Carnarvon - - -	Llanrug - - -	14,794	5

None of these sub-districts in which deaths from Influenza have been so numerous as to be specially noted are purely agricultural. Several are urban in character; at Northfleet the chief industry is cement burning; at Higham Ferrers, shoemaking; in the Batheaston and Llanrug sub-districts, quarrying; and at Aberdare, coal mining.

The return for the second quarter of 1890 contains no notes as to deaths from Influenza.

The local distribution of the mortality from Influenza cannot be worked out until the Registrar-General's Annual Report for 1890 is published.

The case mortality of Influenza varies according to the age of the patients, the circumstances under which they are placed, and also whether all the cases, mild and severe, are counted, or only the severe ones, *e.g.*, the in-patients at hospitals.

Among children in Essex Dr. Thresh reckons the deaths ascribed to Influenza as 4 per 10,000 cases.

In the Army, where the patients' ages and circumstances are favourable for recovery, there were 9 deaths among 8,103 cases, or 1.1 per 1,000.

Among Custom officers at London and Gravesend there was 1 death in 96 cases.

Case
mortality.

In the London hospitals from which I have obtained returns the cases and deaths were as follows:—

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Hospitals.	In-Patients.		Out-Patients.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
St. George's - -	20	—	389	—	409	—
Royal Free - -	1	—	1,754	—	1,755	—
St. Mary's - -	106	2	774	—	880	2
Middlesex - -	39	1	1,282	—	1,321	1
St. Thomas's - -	76	6	1,075	—	1,151	6
Westminster - -	32	1	?	—		
King's College - -	14	—	?	—		
Guy's - - - -	30	1	?	—		
Totals - - - -	318	11	—	—	5,516	9

Among the in-patients only the proportions of deaths was 34·5 per 1,000 cases. Among the total patients at those hospitals at which the numbers of both classes of patients are given the proportion of deaths was 1·6 per 1,000 cases.

VI.—PROPHYLAXIS.

Since our action for the prevention of disease, in order to be effectual, must be based on a knowledge of its causation, it cannot be said that we are yet in a position to advise any measures with a view to prevent the occurrence of another epidemic of Influenza, though we may hope that any action taken for the improvement of the general health and well-being of the population will not be without influence in mitigating the extent and severity of another epidemic, should it again invade our shores.

If the arguments be valid which have been adduced in this report to show that Influenza is—in this country at least—a disease wholly or mainly propagated from person to person, or by human agency, then it would seem that isolation of the sick, especially the early cases, or the drawing of a "cordon sanitaire" between infected and uninfected communities, should theoretically be the most efficacious means of preventing its spread. But owing, on the one hand, to the comparative mildness of the disease to be guarded against, and on the other hand, to the wide diffusion of the infection and the difficulty of recognizing its presence, any such measures applied to the general population would be impracticable: the game would not be worth the candle, even if success were assured. For certain classes of persons, however,—*e.g.*, those in whom from their age or infirmity an attack of Influenza would be specially dangerous, or the inmates of institutions, such as asylums, whose mode of life is subject to regulation, as well as for the first cases in a locality or household (where these are known and their isolation is practicable),—precautions of this nature are advisable, and have been taken in some instances with a measure of success. Thus Dr. Whipham ("Lancet," Feb. 22, 1890) states that Influenza ceased to spread among the nurses at St. George's Hospital when those affected were isolated. In the Darenth Asylum the separation of the female from the male patients seems to have had the effect of delaying, though not preventing, the outbreak among them. Dr. Soutar, of the Barnwood House Asylum, Gloucester, quoted by Dr. Symes Thompson ("Influenza," 1890, pp. 428, 429), concludes that the spread of Influenza among the inmates was prevented by the rigorous measures of isolation which were adopted from the very commencement of the outbreak. With isolation should be combined disinfection of infected clothes and other articles, and of infected places.

The ventilation and cleanly keeping of buildings in which many persons are collected together should receive special attention when Influenza threatens or is present, with a view to avoid the accumulation of dust and dirt, and to secure that the air of the building shall be frequently changed, at any rate during the intervals of its occupation.

Since the development of an attack of Influenza in persons exposed to infection seems to depend very largely upon the receptivity of the subject, it is important that at the time of an epidemic all persons should, as far as they are able, pay attention to such measures of individual hygiene as may best maintain their general state of health, avoiding exposure to cold and fatigue, unwholesome food, and excessive use of alcoholic liquors. Medical opinion, divided in other points relating to Influenza, seems unanimous as to the deleterious effect of exertion or fatigue upon those suffering from Influenza, or exposed to the influence of the epidemic. It has proved the worst policy to "fight against" the disease. Unfortunately, however, during the strain in places of business caused by the disablement of so many of the staff, and in the case of

medical men, nurses, and others, advice as to avoiding undue fatigue is more easily given than followed.

A prophylactic measure which has been recommended by some medical men, based upon the supposed malarial nature of the disease, is the administration of quinine in rather large doses, say 12 grains for an adult daily. At the Birmingham Prison this was thought to have had beneficial results, but the epidemic was already on the decline when the administration of quinine was commenced.

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Prophylaxis.

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CHAP. VII.

Collective
inquiry through
Medical Officers
of Health.

VII.—SUMMARY OF INFORMATION DERIVED FROM
MEDICAL OFFICERS OF HEALTH AS TO THE
DISTRIBUTION OF THE INFLUENZA EPIDEMIC IN
ENGLAND AND WALES.

With a view to collecting information on a uniform plan as to the origin and mode of distribution of the Influenza epidemic in England and Wales, a circular form of queries, of which a copy is annexed, was drawn up by the Medical Officer of the Local Government Board, and sent to the Medical Officer of Health of every sanitary district in England and Wales. (There are 1,777 sanitary districts in England and Wales, viz., 41 metropolitan, 1,003 urban, 675 rural, and 58 port districts, and they are all supervised by Medical Officers of Health; in some instances several districts being combined for the appointment of a single Medical Officer of Health; in other instances one rural district having several Medical Officers of Health, each acting for a different division.)

Medical Department,
Local Government Board,

DEAR SIR,

Whitehall, S.W., January 17th, 1890.

THE Medical Department is endeavouring to gather information respecting the origin and mode of distribution of the Influenza prevailing in England and Wales, and I rely on your assisting me by your experience. I am desirous of collecting such information on a somewhat uniform plan, and would ask you to reply on the enclosed sheets so far as you may be able; filling up one sheet at once, and others at weekly intervals while the epidemic continues in England and Wales. Please post them to me (unpaid), addressed to the Medical Officer of the Board.

I am, dear Sir,

Yours faithfully,

GEORGE BUCHANAN.

The Medical Officer of Health.

Period ended _____ . Name of District _____ .

(Urban or
Rural?)

1. Has any "Influenza," particularly if characterized by much nervous depression, severe frontal headache, or various muscular pains, shown itself in your district?
2. The date of the first occurrence (as far as you know) of such an Influenza.
3. The date of commencement of any extensive prevalence of such Influenza.
4. Any opinion you have formed (or that you wish to modify) as to the mode of origin of introduction of the disease, and as to its method of spread.
5. Have you observed among domestic animals any unusual complaint; and in what animals, and with what symptoms?
6. Illustrations or observations as to the behaviour of any observed Influenza, especially as to the intervals of attack in members of households, its dissemination among particular communities, and its incidence on particular localities.

Signed _____

In reply to this circular answers were received relating to about 1,150 sanitary districts, but the information received from different districts has varied much in quantity and quality. As a general rule the most satisfactory replies have been received from Medical Officers of Health who, being in private practice, have had opportunities of observing the disease and giving information at first hand. In the larger towns, and in combined districts the Medical Officer of Health is usually debarred from private practice, and as Influenza is not among the diseases which are required to be notified to the local authority, or one which usually comes under the cognizance of the Medical Officer of Health as such, the ordinary channels of information are not available to such officers. Hence it comes that the information in the Board's possession respecting the Influenza epidemic in the large towns and in combined districts is often less complete than in the case of the medium sized and smaller districts. Some Medical Officers of Health, not themselves in private practice, have, however, by means of circulars sent to the medical men practising in their districts, obtained very valuable information, which they have collated and forwarded. Among such I may mention Drs. J. F. J. Sykes, of St. Pancras; Niven of Oldham; and Ashby of Reading, among officers of urban districts, and Drs. Woodforde of Berkshire; T. W. Thompson (now of the Local Government Board); and Turner of Hertfordshire; Butterfield of West Kent, and Kelly of West Sussex, among officers of combined districts.

The period covered by the replies has also varied. Some medical officers have sent replies week by week, so as to enable the commencement, height, and decline of the epidemic to be fixed; others have sent but a single reply, perhaps a negative one, although the district may have been subsequently invaded, and for this reason the epidemic may have been more general and severe in the North of England (which was invaded latest) than the replies indicate it to have been. From many districts, again, no replies were forthcoming; but on the whole I think that the Board has less ground for surprise at the omissions than for gratitude to the busy practitioners, who amid the stress of extra work imposed upon them by the epidemic, and at a time when many of them, as the replies mention, were themselves sufferers from it, found time to contribute so much valuable information.

Information obtained from other sources respecting the prevalence of Influenza in particular localities is given in brackets [] in the following summaries.

COUNTY SUMMARIES.*

(The arrangement of these follows that of the Registrar-General.)

I.—LONDON.

(41 districts; 52 Medical Officers of Health.)

Replies received relating to 26 districts or divisions.

Many Medical Officers of Health in London appear not to be in a position to speak from personal observation concerning the amount of behaviour of Influenza in their districts, and only Dr. Sykes of St. Pancras appears to have made systematic inquiries of medical practitioners. Hence their replies as a rule give comparatively little information. Dr. Bristowe of Camberwell, however, gives a good clinical

* As regards the dates given in these summaries as those of the first recorded cases of Influenza, the difficulties noticed on page 10 of this report must be borne in mind, especially when single early cases are in question.

history of the disease quoted on page 59 of this report. The medical officers for Poplar and Battersea also send printed copies of reports made to their Boards on the subject of the epidemic.

Dr. Sykes's summary of the replies received by him is here given:—

Has any "Influenza," particularly if characterised by much nervous depression, severe frontal headache, or various muscular pains, shown itself in your district?	Replies received from 56 medical practitioners in the district recording some 8,000 cases.
The date of the first occurrence (as far as you know) of such an Influenza.	October - - - - - 1 reply. November - - - - - 3 replies. December 1st week - - - - - 4 " " 2nd " - - - - - 7 " " 3rd " - - - - - 9 " " 4th " - - - - - 14 " " 5th week or 1st week in January - - - - - 13 "
The date of commencement of any extensive prevalence of such Influenza.	December - - - - - 4 " January 1st week - - - - - 31 " " 2nd " - - - - - 15 " " 3rd " - - - - - 1 reply.
Any opinion you have formed [or that you wish to modify] as to the mode of origin of introduction of the disease; and as to its method of spread.	Infectious - - - - - 17 replies. Atmospheric - - - - - 16 " Malarial - - - - - 8 " Contagious - - - - - 8 " Non-contagious - - - - - 4 " Non-infectious - - - - - 1 reply.
Have you observed among domestic animals any unusual complaint; and in what animals, and with what symptoms.	Influenza in horses - - - - - 2 replies. Catarrh in dogs - - - - - 4 " " in cats - - - - - 9 " Dyspnoea in cows - - - - - 1 reply. Number of horses affected by Influenza in mews in parish from inquiries made by sanitary inspectors:— October - - - - - 499 horses. November - - - - - 92 " December - - - - - 12 " January - - - - - 4 "
Illustrations or observations as to the behaviour of any observed Influenza, especially as to the intervals of attack in members of households, its dissemination among particular communities, and its incidence on particular localities.	Intervals of attack:— 1 day and under - - - - - 9 replies. 2 days - - - - - 6 " 3 " - - - - - 3 " 4 " - - - - - 3 " More - - - - - 4 "

Dissemination and incidence general as to communities and localities. Adults especially attacked, particularly males. Relapses and intermittence of symptoms observed more or less generally.

February 8th, 1890.

(Signed) J. F. J. SYKES.

The date of the commencement of the epidemic, as given by London Medical Officers of Health, is in most cases the last week in December, and the first few days of January, at which time the epidemic seems to have become general all over London (Dr. Tidy, of Islington, gives January 11th as the commencement of the epidemic; but this date is that of the first death). Earlier dates are, however, given in some districts as that of individual cases, *e.g.*, Poplar, November 18th (a case not recognized at the time, but thought afterwards to be Influenza, others in November and December). December 2nd, Hampstead. December 8th, Hackney. In St. Pancras, one medical practitioner reports a case October 21st; another, one on November 2nd; another, one in the middle of November, and another, one in the end of November.

[Information from other sources shows that there was a considerable prevalence of Influenza in the western suburbs of London, as Bayswater and Shepherd's Bush, during the fortnight before Christmas. Dr.

Domett Stone, medical officer to the Paddington district of the Post Office, informs me that of 340 postmen under his medical charge, about 50 were ill in December with symptoms of Influenza; they were entered by him as "catarrh," although the principal symptoms were nausea, depression, and muscular pains, and catarrhal symptoms were usually absent. The number of cases entered as catarrh by him day by day was as follows:—

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Date.		No. of Cases.	Date.		No. of Cases.
December	2nd	1	December	17th	3
"	3rd	1	"	18th	8
"	5th	2	"	19th	8
"	6th	1	"	20th	2
"	7th	2	"	23rd	1
"	11th	2	"	26th	2
"	12th	1	"	27th	10
"	13th	2	"	28th	1
"	14th	3			
"	16th	5			50

Dr. Brendon Curgenvin, of Bayswater, states that he saw a first group of 12 cases December 16th to 19th, and then after an interval of a week, during which there were only six new cases, a second group December 27th to 31st, of 54 cases. The first cases were mostly solitary ones in different houses in Bayswater; the second group included multiple cases in several houses, and cases occurring among the employés at a large retail establishment at Bayswater.

I am informed by Dr. Watson of Westbourne Grove, the medical attendant at this establishment, (at which there are about 6,000 persons employed,) that there were many cases of Influenza before Christmas, beginning on December 9th or 10th, and attaining a maximum on December 20th, on which day there were 113 cases (chiefly men), after which the number rapidly declined. The daily and total number of cases could not be given; some cases were very slight, and there was believed to be a good deal of malingering. There was at that time no great prevalence of similar cases among his patients outside this establishment.

The proprietor of this establishment could not tell me which was the earliest case of Influenza there, and was not aware of any special predominance of the disease in any one department, or boarding-house, but thinks that drivers and deliverers of goods were most affected. The epidemic commenced in several departments at about the same time, and the fancy department in which most foreign goods are received was not affected before the rest. The horses, of which 300 are kept, were affected with "influenza" before the staff, but not more than 10 or 12 horses were off work at any one time. The stablemen were not particularly affected.

The earliest case diagnosed as Influenza in London, of which I have received information, was one occurring in the household of Mr. Edwin Sass, surgeon, of Gloucester Place, Portman Square, who says, "He commenced on October 13th. His was rather a bad case, but with exactly the same symptoms as we are having now (January 15th), commencing with violent shivering and inability to get warm, pains in head and neck, very violent, then in back and limbs. Temperature rose by the 4th day to 105." (This is not like the temperature curve

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of Influenza, which rapidly attains a maximum, and falls the second or third day.) No explanation could be given of the origin of this case.

The annexed diagram is compiled from lists of the daily number of new cases coming under treatment as out-patients at St Mary's, St. Thomas's, the Royal Free, St. George's, and the Middlesex Hospitals, and as in-patients at these and at the Westminster and King's College Hospitals. These lists have been kindly furnished me by the medical registrars of the several hospitals. At the other large London hospitals I was informed that no accurate record was kept of the number of cases during the stress of the epidemic.* The diagram, however, may be taken to illustrate the rise and fall of the epidemic in London. As few cases apply for treatment on Sunday, but a large number on Monday, I have inserted a mean between the Sunday and Monday numbers instead of giving the two days separately. The few cases before December 25th were almost all at St. Mary's Hospital, Paddington (Influenza, as I have said, having been early present in that part of London); those in February mostly at the Royal Free Hospital.]

II.—SOUTH-EASTERN COUNTIES (SUMMARIES).

SURREY.—(Extra-Metropolitan.)

(31 districts, of which some are combined, and one is divided into three divisions; 26 Medical Officers of Health.)

Surrey.

Replies from 13 districts or divisions.†

Influenza generally prevalent throughout the whole county.

Date of first case in 10 out of 13 districts, within last 11 days of December; in others first days of January. Earliest, December 20th, Croydon; latest January 2nd, Farnham. Extensive prevalence in the 10 earlier districts began in last three days of December and first week in January; in others in middle of January. The epidemic practically over by the middle of February.

Almost all the Medical Officers of Health consider the disease to be spread from person to person. In many of the suburban districts the first cases have been among people going daily to business in London, the disease spreading first to their wives and families, and then to the locally-employed and labouring population. [See notes by Dr. Graham, of Weybridge, on page 309 of this report.]

Low, damp, and overcrowded localities have been observed to be severely attacked.

Cases of "influenza" among horses are mentioned in four districts, but not to any great extent, and in most districts a negative reply given to question 5.

2.—KENT.

(61 districts; 42 Medical Officers of Health.)

Kent.

Replies from 46 districts or divisions.

County in general early and severely attacked.

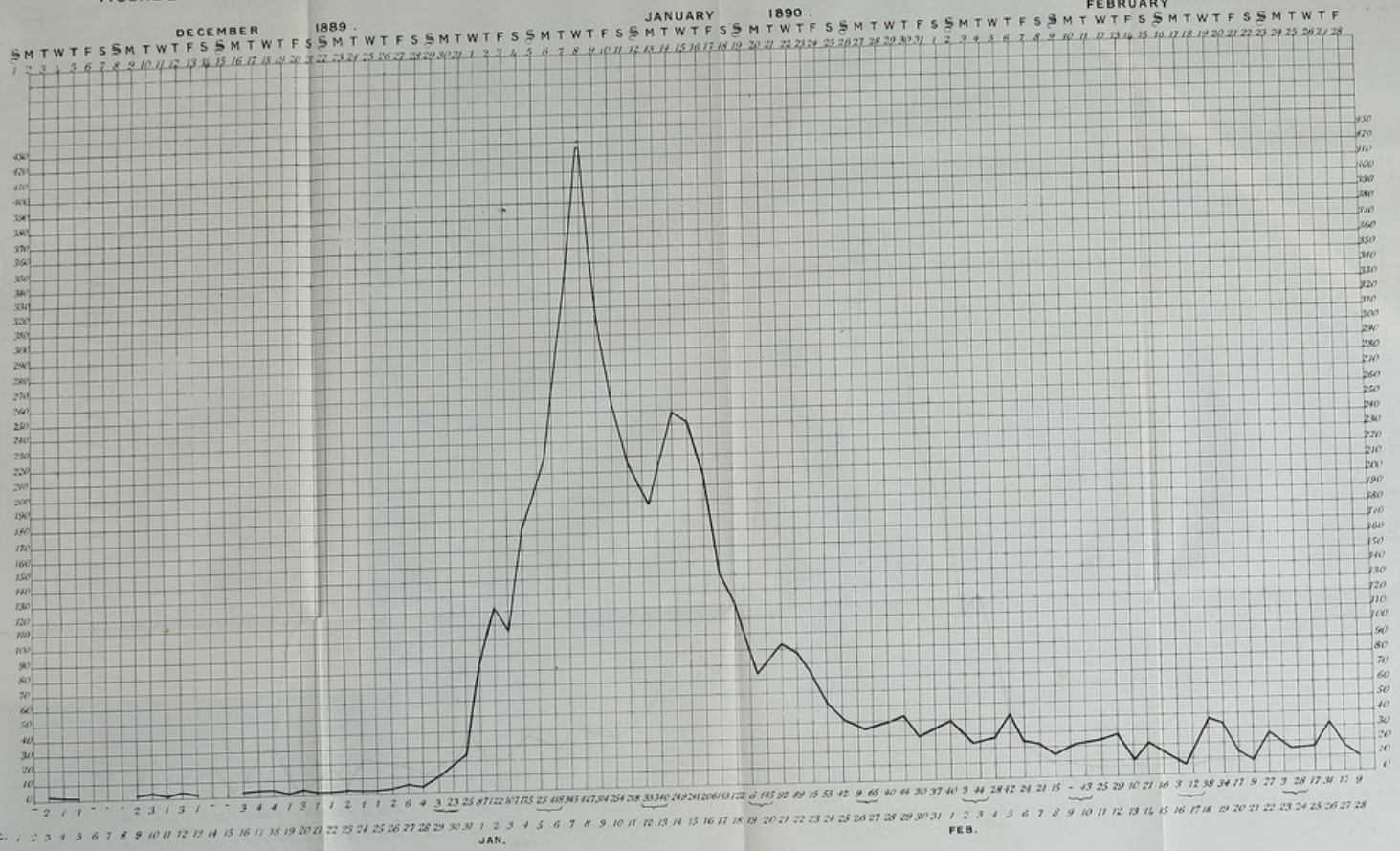
Date of commencement in most districts latter half of December and first days of January, and prevalence soon followed.

* A table of the daily number of cases of Influenza in the out-patient department at the London Hospital in January is, however, given in Dr. Symes Thompson's work (pp. 438-9). It compares closely with the statistics which I have been able to obtain from other hospitals, the greatest number of cases being on 7th January.

† In these summaries R. following the name of a place means Rural Sanitary District; U., Urban Sanitary District.

AGGREGATE DAILY NUMBER OF NEW CASES OF INFLUENZA TREATED AT CERTAIN LONDON HOSPITALS.

To face page 124.



JAMES LEE, 75, 77, Farringdon R.S. District Council. 5084. J. 37.

Early dates. December 12th.—Deal; 24 hours after receipt of letter from Influenza patient at St. Petersburg. The disease was prevalent in the beginning of January, and there was a recurrence in the beginning of February.

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December 21st.—Dover. First cases in garrison, contracted in London by an officer's children; rapidly spread in garrison from January 5th. Prevalent among civil population from January 7th.

December 21st.—Margate, imported case.

December 20th.—Walmer.

December 18th.—Wrotham. No history of introduction there.

At Folkestone not till January 10th.

In several districts (Deal, Sandwich, Wrotham,) a recrudescence in February.

Majority of Medical Officers of Health attribute disease to atmospheric causes, but in many districts there is a distinct history of introduction. In those near London the first cases were all town-going men; their wives and families being later affected. Workmen at cement works and military also largely attacked.

Especially severe in low-lying places by Thames and Medway.

Men first attacked; women and children later and more mildly.

Horses reported to have "influenza" in many districts.

3.—SUSSEX.

(44 districts; 21 Medical Officers of Health.)

Much of this county is comprised in combined districts under two Medical Officers of Health, Drs. Kelly and Fussell. Sussex.

Replies received relating to 29 districts. County generally affected; in some districts one eleventh to one fourth of the inhabitants are estimated to have suffered.

No district reported free except Shoreham Port.

Earliest cases. End of November and early in December, at Hastings: not prevalent there till early in January.

December 6th,—a single case at Coastguard Station, Lancing (Steyning R.).

In nine districts the first case occurred in the last 10 days of December; in all the others in the first three weeks of January, and mostly in the first week. Extensive prevalence in most districts in first 10 days of January; in more than half occurring within a week after first observed case. The epidemic reached its height about the middle of February, and gradually declined, having almost ceased at the end of March; a few fresh cases still occasionally arose.

In many districts the disease was, or was thought to have been, imported from London or other infected places. Dr. Kelly thus accounts for its origin in almost all his districts.

Dr. Kelly says:—

"Meteorological conditions throw no light on the causes of the epidemic. Winds prevailed from all quarters. When rough south-westerly winds blowing in from the sea were common, there seemed no difference in the number attacked."

But in East Grinstead the disease when imported on December 22nd did not spread beyond the household (an isolated one); the town and district remaining free until January 10th, when it broke out in 30 or 40 houses simultaneously, having apparently travelled up the Medway valley from Tunbridge Wells. Many simultaneous cases at commencement observed at Bognor and East Grinstead above. Market towns were affected before the surrounding villages.

Men were commonly first attacked, especially those employed out of doors, but at Brighton especially those in crowded establishments. Few

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pauper cases. School children affected; schools had to be closed in many places, owing to reduction in attendance or illness of teachers. Dr. Fussell believes Influenza to have been spread by schools.

Some Medical Officers of Health consider disease atmospheric in origin, and not infectious. Others consider it infectious, but most express no opinion. In Dr. Kelly's districts medical men seem to have come round to the opinion that it is infectious.

In five districts cases of catarrh or "influenza" recorded among horses, but no great prevalence, and the greater part of the county free.

4.—HAMPSHIRE.

(46 districts; 41 Medical Officers of Health.)

Hants.

Replies received from 38 districts. Of these only Portsea Island R. and St. Helen's, Isle of Wight, are reported free, and Isle of Wight R., as having had no extensive prevalence.

Early dates. November 17th.—The Medical Officer of Health, Whitchurch, saw a case which, in view of subsequent experience, he is inclined to think to have been Influenza. No other occurred till January 18th, and no large prevalence till beginning of February.

December 5th.—Winchester R. December 9th, Portsmouth. (No particulars.)

In all the other districts the disease was first recognised between December 20th and January 25th, mostly in the last week of December and first half of January.

Epidemic prevalence in 17 districts followed the first case in a week or under; in six more in two weeks or under; in five more within three weeks. In Lymington R., Influenza was introduced from London into three households on December 30th, or beginning of January, but it did not spread from these nor become prevalent till February 1st, when it seemed to extend into the district from the adjoining Christchurch and Ringwood districts. Increase in middle of February, after decline, in Cowes and Sandown.

Previous prevalence of ordinary catarrh, apparently merging into Influenza, in Ryde, Sandown, and (?) Southampton.

The Medical Officer of Health, Southampton, believes that he had "influenza," like the epidemic form, in February 1888. The Medical Officer of Health, Whitchurch R., records 25 cases in January 1888, and the Medical Officer of Health, Winchester R., speaks of "influenza" as having occurred probably at decreasing intervals for two years past.

In many districts there was a history of importation of the first case from London or elsewhere, but from some of these the disease did not appear to spread beyond the household, and in other districts, on the other hand, the origin of the disease could not be traced to importation, although when started it spread as by infection. The Medical Officer of Health, Shanklin, believes it to be certainly and largely conveyed by letters. Opinion of Medical Officers of Health generally, though not universally, was in favour of infectious nature of Influenza. Others attribute it to cold damp foggy weather, or other atmospheric influence. The Medical Officer of Health, Sandown, says that the cases increased in numbers in dry frosty weather.

Low damp localities were specially attacked at first, but later high and dry ones have suffered as well.

In particular districts men have suffered before women; adults before children, and the upper class before the labouring class.

Little mention is made of diseases among animals; a few cases of catarrh among horses, and diphtheria (?) among cats are mentioned.

5.—BERKSHIRE.

(18 districts; 10 Medical Officers of Health.)

Replies received relating to 23 districts or divisions.

Many of the districts in this county are under the care of Dr. Woodforde, who has collected information from the medical men practising there, as also has Dr. Ashby, Medical Officer of Health, Reading. (See page 278.)

The whole county has been generally attacked, no district being reported to have escaped, and cases in most have been numerous, and with four exceptions, the date of the invasion of every district is given as in the last week of December, or the first fortnight in January. The exceptions are:—

Windsor, one case reported first week in November, but Medical Officer of Health gives December 23rd.

Reading, "probably one on December 7th (a Post Office employé), a few more in December."

Thatcham, Newbury Rural Sanitary District, one case about December 1st, but doubtful both as to nature and date.

Aston, Wallingford Rural Sanitary District, December 7th, first case a lady, who had received a letter from a relation at Monte Carlo, whose family were all down with Influenza.

But within the limits of a Rural Sanitary District different villages have been affected at different times, *e.g.*, in Abingdon Rural District, Clifton Hampden on December 28th, and Drayton, three miles E. January 17th, three weeks later. Epidemic prevalence soon followed the first cases (except as above); in most districts it occurred in first and second week in January, subsiding in February, but in two places, a revival in middle of February was observed. The County Lunatic Asylum, Wallingford, was not invaded until February 1st, although Influenza was prevalent in the town by January 7th. At Hagbourne (Didcot) the Influenza which prevailed extensively among the railway men from January 14th was preceded by much epidemic catarrh, and at Lechlade Influenza was preceded by croupous pneumonia.

Some histories of introduction are given, as Aston above, Buckland, and Reading; at Windsor the first cases were men going daily on business to London.

Opinion of medical men appears generally to be that the disease is infectious from one person to another, but not to so great an extent as such diseases as measles, but that it is also capable of wide aërial dissemination. Two say that it is malarial, and two consider it like dengue. Dr. Casey, Medical Officer of Health, Windsor, gives strong grounds for attributing its spread to personal communication rather than to atmospheric causes. In several districts well-to-do people were most attacked at first. Males often first attacked. In Bradfield and Wantage R. districts villages on low ground and on clay were attacked first; those on high ground on chalk later and more lightly.

In most districts no epizootic observed, but in several, cases of "influenza" or catarrh among horses are recorded. In Newbury R. a cat and a dog in infected houses are said to have shown symptoms of the disease.

III.—SOUTH MIDLAND COUNTIES.

6.—MIDDLESEX (Extra-Metropolitan).

(26 districts; 24 Medical Officers of Health.)

Replies received from 23 districts.

Early and largely attacked.

In almost all the districts the commencement of disease is given as some date in December.

So late as first week in January only in South Hornsey, Staines, and Uxbridge. Dates early in December are given in several districts.

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Middlesex.

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December 16th.—Brentford, a bedridden lady.

December 5th.—Chiswick.

November 30th.—Finchley (C. J. Harper; P. P. Langford gives December 9th).

December 18th.—Isleworth. Norwood.

December 4th.—Hampton Wick.

The epidemic prevalence of the disease began in almost all districts in the first few days of January: January 1st-4th—in a few only at the end of December; and at Uxbridge and Southgate in the second week in January.

The epidemic seems to have subsided about the end of January.

In the exceptionally early cases no history of introduction is given, but in many suburban districts it is noted that business men employed daily in London were the first to be affected, and that their wives and children were later attacked; the locally employed population suffering later than the town-going one. [See some notes by Dr. Howard Murphy, of Twickenham, at page 302 of this report.]

No disease was apparently prevalent at the time among animals, but a few instances are noted of "influenza" among horses and of illness of cats.

7.—HERTS.

(26 districts; 11 Medical Officers of Health.)

Herts.

Replies relate to 19 districts. (See communications by Dr. Thompson and Mr. G. Turner on pp. 268 and 271.)

Influenza has been generally and extensively prevalent in Hertfordshire: no district is reported as exempt, and in every district it is reported as having been extensively prevalent.

The epidemic nearly coincided with that in London. Excluding a case on December 9th at Cheshunt, imported from Holland, the earliest known cases in every district occurred in the last half of December or the beginning of January; extensive prevalence following in the course of about a week, except in Cheshunt, Watford R., and Welwyn where an interval of three weeks elapsed between occurrence of an imported case, and extensive prevalence.

Medical opinion is divided on the question of the infectious nature of Influenza, but several instances are given of the spread of the disease from an imported case, and in several districts men going daily to business in London have at first been the chief sufferers.

Horses are reported to have suffered from "influenza" in several districts, especially in those near London.

8.—BUCKINGHAMSHIRE.

Replies from 10 districts or divisions only.

Bucks.

District.	First recognized case.	Prevalence began.
Aylesbury - - - -	Third week in December.	First week January.
Chesham - - - -	Middle of December	Middle January.
Wycombe R. (two divisions)	December 30th	1st week January.
Amersham - - - -	January 2nd	January 7th.
Winslow - - - -	January 4th*	January 29th.
Newport Pagnell - - -	January 2nd	January 12th.
Wycombe, N. - - - -	January 1st	January 7th.
Aylesbury R. - - - -	January 5th	January 15th.
Buckingham - - - -	January	January

* According to the Medical Officer of Health of Buckingham, who reports his town then free, but who saw an imported case at Winslow on January 4. The Medical Officer of Health Winslow, on the other hand, says that the disease came from Buckingham to Winslow.

Previous prevalence of catarrhs is reported at Chesham and Winslow, merging into Influenza epidemic.

In several districts adults have chiefly suffered, but at Chesham, children, the disease being thought to be spread by schools. At Aylesbury inmates of workhouse and prison escaped, though prison warders and their families suffered severely. At Winslow several persons confined to house were attacked, in one instance through an infected letter. In several instances disease imported from London. Several Medical Officers of Health believe disease to be contagious, others express no opinion as to its etiology.

Catarrhal disease among horses in Aylesbury R., Newport Pagnel R., concurrent with epidemic; preceding it in Wycombe borough; and following it in Wycombe R. Instances also among dogs and cats.

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9.—OXFORDSHIRE.

(18 districts; 4 Medical Officers of Health.)

Reply received from Oxford only. Most of the districts in the county are combined under one Medical Officer of Health, who did not reply to the Board's circular. Oxford.

[Some of the places referred to under Berkshire are in Oxfordshire, the sanitary districts overlapping the county boundaries.]

At Oxford Influenza was first observed, December 17th, and was prevalent January 5th. Some of the cases originated in London, others without known exposure to infection. Medical opinion is divided as to its infectious nature. It was specially prevalent at University Printing establishment, Post Office, and large business houses. Children at first escaped. A few cats are said to have suffered.

10.—NORTHAMPTONSHIRE.

(22 districts; 14 Medical Officers of Health.)

Replies received from 15 districts. One Medical Officer of Health is unable to give any information. The Medical Officer of Health Wellingborough R., reports an unusual amount of catarrh, but does not believe it to be different from ordinary "cold." [But see page 116.] All the other districts are reported as affected, and several extensively. Northants.

No very early dates are given, the earliest being the third week in December, viz., Towcester R., where it was imported from London. The date of the first observed cases in five districts was in the latter half of December, in eight in the first half of January. Extensive prevalence in some districts began at once, and in none was it delayed more than a fortnight after the first cases. Generally prevalent in January.

Commencement by a number of simultaneous cases observed in Brackley, Daventry, Northampton R., and Kettering districts. Origin traced to importation from London in Oundle R. and U., and Towcester R. districts, in others attributed to atmospheric causes. Some of the Medical Officers of Health who hold the latter view of its origin believe the disease to be in some degree infectious. Special incidence on men observed in some districts; in Potterspury R. on those associated together in workshops; farm labourers being not much affected.

At Brackley low-lying damp situations were thought to suffer most, but in Daventry people on the hills were quite as much affected as those in low-lying places.

"Influenza" prevalent among horses in Daventry, Oundle, and Towcester districts; at Daventry of a severe kind "certainly not ordinary influenza."

11.—HUNTINGDONSHIRE.

(8 districts; 6 Medical Officers of Health.)

Replies from six districts.

No great prevalence, except perhaps at St. Neot's, where introduced, December 24th, by visitors from London; in other districts dates of first cases given at January; no extensive prevalence.

Medical Officers of Health mostly appear to think cause an aggravation of ordinary atmospheric and malarial conditions. No prevalent disease among animals. "Influenza" existed among horses at St. Ives, but not prevalent.

12.—BEDFORDSHIRE.

(9 districts; 6 Medical Officers of Health.)

Bedford.

Returns from six districts, Influenza prevalent in all. Earliest date, December 10th, Bedford.

District.	Date of first known Case.	Date of extensive prevalence.
*Bedford - - -	December 10th - -	January 5th.
*Bedford R. - -	After Bedford town -	January 20th.
Luton - - -	December 27th - -	End of January.
*Biggleswell R. - -	January 2nd - -	Soon after January 2nd.
Dunstable - - -	Beginning January -	February 5th.
*Woburn R. - - -	January 12th - -	January 22nd.

* Under one Medical Officer of Health.

Extensive prevalence followed immediately in some districts, in others not till after lapse of a month, a succession of cases filling up the interval.

History of importation of disease in some districts, *e.g.* Bedford R., Dunstable, and Luton. In Woburn R. it is said to have broken out in several places independently. Its infectious nature was more or less recognized in all districts. Towns were invaded before villages, and of villages some were invaded, while others escaped, the difference not being connected with difference of soil (whether sand or clay). In Biggleswade R. the disease was thought to have been originally contracted from a horse. No other record of disease among animals.

13.—CAMBRIDGESHIRE.

(17 districts; 11 Medical Officers of Health.)

Cambridge.

Replies from 10 districts.

Influenza has prevailed more or less in several districts; extensively at Sawston and Whittlesford in Linton R.D., at Newmarket and at Cambridge.

In most districts the date of commencement was the first week in January, and the disease became prevalent in the second and third week in January. At Cambridge cases occurred in middle of December in persons recently come from the south. At Newmarket it began in the last week in December, and became prevalent in the first week in January. At Doddington one case, December 29th, introduced from Edinburgh. No very early dates.

At Cambridge the main incidence fell first upon well-to-do people who had been away for Christmas, and next upon undergraduates immediately after coming up to the colleges.

In some districts it was considered to have been introduced by holiday makers from London, &c., and to have spread from them. In general no cause assigned.

No diseases among animals observed. Absence of "influenza" among the large number of thoroughbred horses (some 2,500) kept at Newmarket, was affirmed by veterinary surgeons.

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IV.—EASTERN COUNTIES.

14.—ESSEX.

(34 districts; 33 Medical Officers of Health.)

Replies received relating to 31 districts or divisions.

The epidemic was early established over the whole county. No district was reported free, and few without extensive prevalence. Epidemic was very severe and widespread in many districts.

First recorded case in November in one district*; in December in 17; and in January in 13.

The Medical Officer of Health of Leytonstone thinks that he had Influenza himself on November 1st, and again on November 29th (extensive prevalence began January 3rd).

December 9th, at Forest Gate District Schools.

In all the other districts the earliest cases are reported as occurring between the middle of December, and the middle of January. But within the limits of a Rural Sanitary District intervals of two or three weeks have been observed between the dates of invasion of different parishes. Extensive prevalence usually followed the first cases within one or two weeks, and in most districts the epidemic prevailed in January, declining in the first or second week in February.

The disease was imported from London into Billericay R., Braintree (?) and Maldon U. districts. At Chelmsford, Leyton, and Walthamstow the first cases were in London business people, their wives and families suffering later. But in many districts (*e.g.*, at Bradwell in Maldon R., *see* page 74), the circumstances of the occurrence of the disease were such as to lead observers to attribute it to wind-borne infection, though several Medical Officers of Health who hold this view think that when established it can be propagated from person to person. Towns were generally attacked before the neighbouring villages, but at Halstead the reverse was the case.

Males were specially attacked at first in several districts, women and children later. But children have suffered in large numbers, though less severely than adults, and many elementary schools have had to be closed.

At Walthamstow children in three large school institutions escaped, though the staff suffered. At Forest Gate District Schools on the other hand, although numerous cases occurred among the children, yet only one of the staff was affected. At Ingatestone the girl's side of an elementary school was so numerously attacked that it had to be closed, while the boys' side was unaffected. [Training ships in the river Thames at Grays suffered largely, *see* page 214.]

Other special incidences observed were on London business people, as noted above, on workmen in foundries at Maldon, and on employés in Royal Gunpowder Factory at Waltham Cross, of whom 25 per cent. were attacked. [Colchester garrison was largely attacked.]

"Influenza" among horses was recorded in five districts. At Walthamstow at a livery stable where nearly all the stablemen had Influenza, of 30 horses only one said to have taken "influenza," the others remaining healthy. At Brentwood a cat suffered from symptoms

* In November and December 1889 an epidemic locally called "influenza" affected 50% of the children in the schools at Pleshey and Great Waltham (Chelmsford R.S.D.), but the Medical Officer of Health does not think it the same as the Influenza which affected other schools in that district in January 1890. In the epidemic in January children in these villages escaped, but adults were affected.

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of "influenza" a week before the household, and at Chelmsford one died at the time the family were ill.

15.—SUFFOLK.

(28 districts; 21 Medical Officers of Health.)

Suffolk.

Replies received from 26 districts. The whole county generally and somewhat severely affected. Several deaths. Only East Wickham Rural district is reported free.

Earliest reported case occurred December 10th, at Fulton in the Mutford and Lothingland R.S.D., and was that of a gentleman who had just returned from a ball at Sandringham.

With this exception, the dates of the first cases in every district are given as between December 21st and January 16th; extensive prevalence usually commencing in the beginning or middle of January, and being continued on through February. But within the limits of the same R.S.D., different villages were attacked at different dates, *e.g.*, in Hartismere R., the first case occurred at Occold, December 24th, and that at Gislingham, January 14th; in Mutford and Lothingland R. first case at Fulton, December 10, as above; at Ashley, December 22nd; at Pakefield, January 23rd. (N.B.—I find a difficulty in some districts in Suffolk in locating the early cases, as in that county the Rural Sanitary Districts do not generally bear the name of the principal place therein.)

There was a history of introduction at Lowestoft from Antwerp; at Bury St. Edmunds and Eye from France; at Stowmarket from London. In Bosmere R. Influenza is said to have appeared simultaneously in several villages, and in Mildenhall R. first at an isolated house in the Fen. Several Medical Officers of Health consider the disease infectious; others consider its cause atmospheric, damp mild weather or other unknown condition.

Men were first attacked, women and children later. Farmers going to market were attacked before agricultural labourers. Upper class people were attacked first in some places. People in factories and works were largely attacked, also gamekeepers and others out at night.

Absence of noteworthy disease of animals in most districts. "Influenza" prevailed among horses in Eye, Lowestoft, Sudbury R., and Southwold, and that at Lowestoft was said by a veterinary surgeon to be of very bad type unlike ordinary catarrhal Influenza, and to be contagious and infectious, though due in the first place to atmospheric malaria.

16.—NORFOLK.

(32 districts; 28 Medical Officers of Health.)

Norfolk.

Replies from 27 districts.

County generally affected. Cases numerous in many districts, but apparently mild, few deaths being recorded. Aylsham is the only district returned as free. Invasion from middle of December (Smallburgh R. and Wells) to middle of January, but mostly first week in January. Early in December at King's Lynn, but no extensive prevalence there.

Prevalence in districts attacked in December began in the first week in January; in places attacked first week in January it began in the middle of January. (An exception was Smallburgh, where the first cases occurred in the middle of December; but extensive prevalence not until January 27.) But the towns have been attacked before the rural places in their neighbourhood. Railway officials seem to have been specially attacked.

History of importation from London and elsewhere to many districts, the disease spreading through the households. Medical opinion preponderates in favour of infectious character of the disease, though several Medical Officers of Health think that infection is conveyed

through atmosphere. Men seem to have been specially attacked at first rather than women and children. No marked prevalence of disease amongst animals, the existence of any such disease in several districts was denied. Cases of "influenza" in horses are mentioned in two districts, and also catarrhal symptoms in cats.

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V.—SOUTH-WESTERN COUNTIES.

17.—WILTSHIRE.

(30 districts; 25 Medical Officers of Health.)

Replies received relating to 22 districts, and incidental information as to another. Only one district reported free (Amesbury R. January 25), no extensive prevalence in three others. Severe in New Swindon, Chippenham U. and R., Melksham U. and R., and Mere R.

Wilts.

First observed case in December in five districts, in January in 14, not stated in three.

Pewsey R. Medical Officer of Health first gives January 12th as date of first case, but afterwards says there were isolated cases about middle of December. Extensive prevalence began January 27th.

December 18th.—Salisbury, prevalent January 4th.

December 24th.—Wilton, spread from imported case, prevalent end of December.

December 25th.—Calne R., an imported case.

December 28th.—New Swindon, prevalent January 10th.

In most other districts extensive prevalence began latter half of January or beginning of February, decline in latter part of February and March. Imported cases, from London or elsewhere, in many districts. In some of these (*e.g.*, Wilton, Tisbury R., and New Swindon) extensive prevalence developed soon; in others the imported infection did not spread, or not beyond the household, and the disease, if it became epidemic, did so later, and had apparently a different origin (Mere R.).

At New Swindon brought to G.W.R. Works by men returning from holiday-making in London and other places, and spread largely among railway employés, being taken by those residing in the country to the villages where they lived.

At Devizes simultaneous cases in three localities, one-half to three quarters of a mile apart, ascribed to the patients having received infection at a church from the soldiers present at the service; two cases being admitted to the Barracks hospital the next day.

Opinion of Medical Officers of Health preponderates in favour of disease being more or less infectious. Some think it malarial. At Melksham, low damp localities near canal most affected. (But Mere R. District extensively affected lies high and dry on chalk and green sand.)

Special incidences on post office officials at Salisbury and Chippenham, on railway servants and workmen at Salisbury and New Swindon.

No special diseases of lower animals were observed in most districts, and several districts are declared to be unusually free from animal disease. "Influenza" was present among horses near Wilton in October, but did not spread to the stablemen. Cats and dogs suffered from catarrhal symptoms in Salisbury, Alderbury, Devizes, and Malmesbury R. districts (apparently during course of Influenza epidemic).

18.—DORSETSHIRE.

(22 districts; 19 Medical Officers of Health.)

Replies from 18 districts or divisions.

The epidemic was early established in the end of December, at Weymouth and Portland. The disease was imported by soldiers returning off furlough in London, and spread rapidly among the garrison and seamen, reaching the civil population at Portland "tophill" later (page 289-290).

Dorset.

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It developed late, end of January or February, at Bridport, Dorchester, and Wareham.

Escaped to date of report,—Beaminster (January 27).

County in general apparently lightly attacked; severe at Poole and neighbourhood, Wareham, and Weymouth.

At Portland medical men concur in attributing spread to infection, elsewhere opinion divided.

Animals generally reported as free from disease. "Influenza" prevailed among horses at Dorchester, while the town was as yet free from human epidemic. Stray concurrent cases among cats and dogs at Shaftesbury and Weymouth.

19.—DEVONSHIRE.

(51 districts; 44 Medical Officers of Health.)

Replies from 36 districts.

Devon.

Prevalent in many districts. Only Axminster returned as free up to date of return (January 20); in some other districts there were only a few introduced or scattered cases.

Date of first cases generally end December to middle January, especially first week in January; an early centre being established at Plymouth.

A marked increase in end of January and beginning of February in many districts in which there had previously been scattered cases. The Dartmoor villages escaped till late; but Lynton which is on the top of a hill was attacked before Lynmouth which is in the valley below.

Introduced in many instances. Among newspaper staff at Plymouth by editor returning ill from London (page 287).

December 18th.—First case at Paignton, postmaster who had sorted a heavy mail from Paris (page 288).

But where Influenza was introduced an extensive prevalence has not always followed (Salcombe and Honiton) or not until some time afterwards (in Tavistock R. and Holsworthy R. districts not until after one month interval); or no connexion could be made out between the first group of cases and the subsequent epidemic (Lynton, Ilfracombe, Devonport).

Medical opinion divided, but balance in favour of its being more or less communicable. Others assign exposure to weather, stagnation of air, or poison borne by air currents. Men working in open air and in factories generally most affected.

Diseases of animals.—"Influenza" among horses noted in many places, but not as specially prevalent: catarrhal symptoms among cats.

20.—CORNWALL.

(35 districts; 29 Medical Officers of Health.)

Cornwall.

Replies from 26 districts and divisions, and incidental information as to another district.

Cornwall has been affected unequally; the districts in the west of the county seem to have suffered more than those in the north and east. Bodmin and Camelford R. districts are reported to have escaped, and others to have been but slightly affected; cases have been numerous in Camborne, Liskeard, Penzance, Phillack, Redruth, St. Austell, Newquay, and one village in Truro R.

Influenza reached Cornwall late. No cases are reported before January 1st. Cases are reported in the first week in January in Helston, R., Newquay, Redruth, St. Austell, and St. Germans, but these were not followed by epidemic prevalence till the end of January or first half of February. The epidemic reached the Scilly Isles about the middle of February. [There is frequent communication with the mainland at this time of year through the flower trade.]

The disease was introduced from London into Liskeard R. and Redruth (two cases, January 1st and 3rd), and is believed to have been introduced into St. Columb Major R. (by commercial travellers), Stratton R. (source not stated), Newquay (from Denmark), and Truro (by German and Russian letters). Some Medical Officers of Health attribute its spread to direct infection, others to atmospheric causes, especially mild damp weather; more express no opinion. No special incidence noted on any particular class of people, except at Liskeard, where Influenza prevailed among the scholars at a day-school at which the teachers had previously suffered. At Penzance people of upper class first affected.

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Horses have suffered notably from "influenza" before the human epidemic at Camborne, Penzance, St. Columb Major, and Truro R., and from quinsy at Liskeard R. Dogs and cats in affected households are noted to have been attacked at Padstow and Penzance.

21.—SOMERSET.

(36 districts; 32 Medical Officers of Health.)

Replies received from 24 districts or divisions. Influenza occurred generally throughout the county. No district reported free, but in several no great prevalence up to date of return.

Somerset.

Earliest case, middle of December, at Milborne Port in Wincanton R. S. D. (prevalent there first or second week in January).

December 30.—Yeovil R. December 31st.—Langport and Wells.

In all other districts first case some time in January. Extensive prevalence followed first case usually in one to three weeks.

History of importation at Clevedon, Wellington, Weston-super Mare, and Wincanton R. (three places). But in Minehead division, Williton R., the first eight cases began on one day, Monday, January 6th, occurring in several parishes, and several more on the Monday following.

Most Medical Officers of Health recognise the disease as more or less infectious, though several attribute it wholly or in part to atmospheric causes (cold damp weather mentioned).

Persons working together in large numbers in factories, &c. especially attacked (Frome, Street, Wellington); at Wellington those employed in hot weaving sheds suffered most. In Wincanton R. and Wellington R. low damp localities attacked first or most; in Bath R. and Midsomer Norton places on hills especially attacked; in latter colliers are said to have escaped.

A few cases of "influenza" among horses recorded, but in most districts no epizootic observed.

At Stogumber (Williton R.) "influenza" said to have been prevalent among dogs at Christmas (human epidemic beginning January 20th). Sheep dogs, which are always out of doors, escaped.

VI.—WEST MIDLAND COUNTIES.

22.—GLOUCESTERSHIRE.

(33 districts; 23 Medical Officers of Health.)

Eleven districts in this county are combined under one Medical Officer of Health, who reports on January 18th that up to that time there had not been to his knowledge any prevalence of epidemic Influenza in any of his districts. Replies have been received from 17 other districts or divisions, in all of which Influenza had occurred, though in four it was not extensively prevalent. Severe epidemic at Stroud, Haresfield, and Leckhampton. In several districts cases seem to have been generally mild, the typical cases being interspersed among a number of others like ordinary catarrh.

Gloucester.

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November 23rd.—Cheltenham; introduced into Medical Officer of Health's household from London, and spread. Prevalence began middle of December among post office employés.

Dec. 20th.—Haresfield division, Wheatenhurst R., prevalent Jan. 13th.

December 25th.—Frampton division, Wheatenhurst R., no extensive prevalence.

First observed case in one district in November, in four in December, in 13 in January. Extensive prevalence followed immediately in some districts, developed in January, and continued through February, declining towards end of that month.

Imported from London at Leckhampton and Cheltenham, from Paris at Charlton Kings. In Haresfield division occurred simultaneously over a wide area, but continued to spread by individual contact.

Medical Officers of Health who express an opinion generally attribute it to atmospheric causes (miasm, mild damp weather), several consider that it also spreads by infection.

Special incidence at Barton Regis, first on upper class [? on Bristol business people]; working class, children, and servants being affected later; Stow-on-Wold R., on working class, confined to portions of three villages; in Haresfield division first on thickly populated localities. About Stroud places on high ground escaped, or were more lightly affected than those in valley. At Cheltenham scarlet-fever convalescents in Delancy Hospital were attacked after the nurses, and in one case the two diseases appeared to be concurrent.

Previous prevalence of catarrh is mentioned in Bristol, Dursley, Newent, Stroud (especially among school children), and Tewkesbury.

Little mention of illness among animals.

23.—HEREFORDSHIRE.

(12 districts; 6 Medical Officers of Health.)

Hereford.

Several of the districts in this county are under one Medical Officer of Health, Dr. Sandford, who has consulted with the medical men in different districts. Replies relate to 8 districts.

Date.—Commencing over the county generally about middle of Jan.

Earliest reported case, beginning of January, at Leominster, reported by Medical Officer of Health in private practice. January 7th, Kington.

Generally diffused over county, but cases not numerous and of mild type.

Dr. Sandford thinks the disease of atmospheric origin, and later (February 19th) attributes it to east winds (which, however, did not prevail in January). He has heard, however, of some cases pointing to its spread by contagion.

Diseases of animals nil, except that Medical Officer of Health, Leominster, reports strangles and "influenza" among horses last spring.

24.—SALOP.

(26 districts; 7 Medical Officers of Health.)

Shropshire.

Returns from five districts only, most of the districts in the county being under one Medical Officer of Health, who has not sent in any reply. All five districts affected; in two districts, first cases in December; in three, in January.

December 9th.—Wem, imported from London.

Medical Officer of Health, Drayton R., reports that catarrh has been generally prevalent in the district, but that comparatively few cases have been characterised by special pains or prostration. Many children have been absent in rural schools through colds. People working in the open air suffered less from Influenza and catarrh than the well-to-do.

[The "British Medical Journal" of January 18th, 1890, states that Influenza was then prevalent in Shrewsbury, having first appeared about 10 days before; it was then spreading to the surrounding country. For accounts of other localities see pages 88 and 316.]

Medical Officer of Health, Oswestry U. and R., reports (January 24th) that for the last month there had been severe colds in children, ending in bronchitis and catarrhal pneumonia, affecting all the children when once a case appeared in a house. Influenza in adults seemed to follow this; some of the cases having severe neuralgic pains with tendency to catarrhal pneumonia. He considers the disease, however, to be a specific fever, having not the slightest resemblance to the ordinary English "influenza."

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25.—STAFFORDSHIRE.

(48 districts; 45 Medical Officers of Health.)

Replies received from 43 districts or divisions. The county unequally attacked; the Black Country, on the whole, very severely; the Potteries and rural districts less so; Biddulph, Newcastle R., Stoke R., and Stafford R. reported to have escaped; the former up to March 8th, the others, however, only up to January 27th and 18th. No extensive prevalence recorded in Burslem, Kidsgrove, Leek U. and R., Stoke, Stone R. (two divisions) in north of county; in Rugeley and Stafford in centre; and in Harborne, Tettenhall, Walsall R., and West Bromwich R. in South Staffordshire.

Stafford.

Early dates.—November 23rd, Rugeley. A single case, believed to be true Influenza, no history of introduction. About 10 others in succession through December, unconnected with each other.

Early in December, at Burslem (origin attributed to neglected cold), no extensive prevalence reported.

December 9.—Burton (extensively prevalent first week in January to March 11).

December 16th.—Smethwick. December 17th, Newcastle.

In other districts in last week in December, or in January, except Leek R. and West Bromwich R., not attacked till February.

Extensive prevalence began in most instances in course of first and second week after first case. In most districts it existed in January. In Darlaston a recrudescence about February 10th. Epidemic declined in the districts as to which information exists, in the end of February or first half of March.

Few instances of importation. Imported into a convent at Stone, and nine days later affected many of the nuns, who never go out. To West Bromwich, as supposed, by letters from Germauy.

In Rowley Regis said to have affected whole area of district simultaneously and whole families together, date of first cases and of prevalence being both given as January 10th.

Much difference of opinion as to origin of disease. The majority of Medical Officers of Health ascribe it to atmospheric conditions (foggy weather, mild damp weather, and sudden changes, are mentioned), and look upon it as little if at all infectious. Others look upon it as entirely or largely propagated from person to person.

Adult males have in many districts been especially affected, particularly those employed together in large works. The first case in a household usually the father; women and children less affected. An exception at Rowley Regis, where disease was particularly rife among children of 2 to 15 years. One Medical Officer of Health thinks disease most severe and prolonged in unhealthy localities; others think locality and sanitary condition have no influence.

Prevalence of catarrh, without typical symptoms of Influenza, recorded in Lichfield R. and U. [no information given as to whether Influenza followed, but it occurred in the Lichfield barracks], Leek (before Influenza epidemic), Tamworth U. and R. (merging into the more severe type about January 22), Stoke-on-Trent (only simple cases of "ordinary influenza"), and Willenhall and neighbourhood (unusually free from

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catarrh until end of December, then prevalence of acute catarrhs of ordinary character; and finally, a number of cases presenting characters of the epidemic).

Horses in many parts of the county (especially about the Potteries) have before the human epidemic been largely affected by "influenza," catarrh, or "pink eye," and in one case in the Wolverhampton district a groom in an infected stable was taken ill (? of Influenza), followed by pneumonia. But in the Potteries, where the horse "influenza" seems to have been most prevalent, the human disease was not particularly so, and in Tamworth R. the "influenza" among horses occurred where there was no epidemic among human beings. A few cases of catarrhal symptoms among cats and dogs in houses in which Influenza existed.

26.—WORCESTERSHIRE.

(34 districts; 34 Medical Officers of Health.)

Worcester.

Replies received from 23 districts or divisions. Two reported free (to January 18th and 21st only), and in two, Shipston-on-Stour and Stourport, though catarrhs have been prevalent, Medical Officer of Health is not sure that there was true Influenza. Extensive epidemic at Kidderminster, Bromsgrove, and Worcester. First case observed in five districts in December, in 13 in January, and in one in February. Extensive prevalence in January and February, decreasing toward end of latter month.

December 8th.—Kidderminster. The first case a German just returned from the Continent. A centre of infection early established at Kidderminster. Cases in two divisions of the Kidderminster R. district before end of December. Second week in December at Worcester.

Mid-December (?) at Balsall Heath, but not recognised. First undoubted case, January 5th.

The majority of Medical Officers of Health consider the disease infectious. Some attribute it to atmospheric causes (germs, malaria, warm moist air alternating with cold winds).

Special incidences.—On colliers near Bewdley; on railway employés and people going daily to Birmingham, at Bromsgrove; on adult males and children of labouring class, in Chaddesley Corbett division, beginning in parts next Kidderminster, where many people working in the carpet factories live; higher classes attacked later; at Worcester, in factories, schools, and densest parts of city.

Horse "influenza" recorded at Chaddesley Corbett only. Cats have had symptoms of "influenza" at Dudley, and at Bromsgrove in one house the cat died with such symptoms a week before the Influenza appeared among the family.

27.—WARWICKSHIRE.

(25 districts; 15 Medical Officers of Health.)

Warwick.

Replies received from 11 districts.

Information imperfect. No reply from Birmingham, nor from Medical Officers of Health of two combined districts, comprising the greater part of the county.

[From newspapers, however, it would appear that the Influenza commenced in Birmingham, December 23rd and began to prevail as an epidemic about January 4th.]

Earliest dates.—November 10, Coventry R. (imported), not prevalent till January 15th; December 8th, Aston R., but no great prevalence; (Medical Officer of Health, Aston Manor, however, only reports prevalence of ordinary catarrh until February 26th); at Saltley, middle of December. At Nuneaton R. and U., Chilvers Coton, Leamington, and Sutton Coldfield, in last week in December, becoming prevalent (if at all) first week in January.

At Coventry began early in January, and in the adjoining district of Foleshill soon after.

Severe at Coventry, especially among working class, 40 per cent. of population affected. [Birmingham does not seem to have been so severely affected as many neighbouring places, especially those in the Black Country.]

Two Medical Officers of Health consider disease infectious; one not; two attribute it to atmospheric causes (warm days and cold nights); most express no opinion. No history of introduction.

"Influenza" among horses prevalent at Leamington and some cases are reported at Nuneaton.

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VII.—NORTH MIDLAND COUNTIES.

28.—LEICESTERSHIRE.

(22 districts; 15 Medical Officers of Health.)

Replies from 12 districts.

Leicester.

Some districts, as the manufacturing towns of Leicester and Loughborough, attacked severely; rural districts apparently less so.

Epidemic prevalence began in several districts in second week of January, *e.g.*, at Hinckley, Belgrave, Leicester, Market Harborough, Shepshed; in others not till later, February, *e.g.*, Measham and Loughborough.

Earliest reported cases.—December 21st, Shepshed; last week in December, Belgrave.

In Ashby R., railway men first attacked.

History of importation at Quorndon, January 12th.

In Melton Mowbray R., considered to have spread from neighbourhood of Grantham.

Opinion of Medical Officers of Health that contagion has less to do with its spread than atmospheric causes,—something in the air, or mild damp weather.

No marked prevalence of diseases among animals. Ordinary "influenza" among horses at Measham before epidemic.

In Melton Mowbray R., villages on ironstone were attacked later and less severely than those on the lias clay.

29.—RUTLANDSHIRE.

(2 districts; 1 Medical Officer of Health.)

No return received.

Rutland.

30.—LINCOLNSHIRE.

(38 districts; 34 Medical Officers of Health.)

Replies from 36 districts or divisions.

Lincoln.

Influenza prevalent in many districts, and severe in several.

Date of commencement very different in different districts, but early in many.

Early dates.—Barton on Humber middle November, prevalent middle December; Cleethorpes, middle November, prevalent December (but in contiguous district of Clee-cum-Weelsby not seen till January 2nd, and not extensively prevalent); Grantham R., first week in December; Grantham U., November 15th, at New Somerby School, which in consequence was closed December 9th; Holbeach, December 14th, prevalent December 20th; Horncastle U., Middle September, ("three well marked cases") prevalent middle January; Louth R. and U., began November, prevalent December 1st; Caistor R., end

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November; Market Rasen, December 7th (no great prevalence); Donington, November 26th (but Spalding and other parts of R. district free); Spilsby R., middle November; Winterton and neighbourhood, end November, prevalent about Christmas.

But other localities not affected till January, and Medical Officer of Health, Boston, reports town free week by week till February 12th. Renewed outbreak at Grantham about that time. Spalding U. and R. (except Donington) reported as escaping. A prevalence of "ordinary bad colds" previous to Influenza epidemic noted in Sleaford R., Donington, Spilsby R., Boston R., Brigg R. and Broughton, Grimsby (?), Horncastle R. and U., Lincoln R., Louth R.; and in some of these (Brigg R. and Donington) it is stated that among the cases of ordinary catarrh were some marked by frontal headache, pains, &c.

High-lying places seem as a rule to have suffered first, those in the fens later (exceptions, Cleethorpes, Holbeach, Donington, which were early attacked).

The medical men generally attribute the disease to atmospheric causes, either to a poison in the air, or to climatic causes, as fogs, east winds, mild damp season, sudden changes. Several recognise it as spreading by infection under certain circumstances.

Few histories of introduction. By vessels from foreign ports at Grimsby; by trippers from London, at Horncastle; but after cases had been reported to have originated in the neighbourhood.

Primary incidence on male adults not so generally noticed. At Brigg, Grantham, and Donington children early affected.

Outdoor people first or most affected at Bourne (apparently), Brigg and Clee; indoor people at Sleaford R. and Donington.

Well-to-do people first at Gainsborough only. Labouring classes especially in several places.

Animals reported free from disease at Barton-on-Humber, Boston, Gainsborough, Market Rasen, Skegness, Spalding U. and R., Stamford U.

In several districts "influenza" reported as very prevalent among horses. Mr. Gresswell, veterinary surgeon, Louth, believes "influenza" was communicated from horses to human beings. Cats and dogs in several districts thought to have contracted the disease when prevalent among human beings.

It would seem as if Influenza may have originated in Lincolnshire, either by progressive development from catarrhal affections of ordinary kind, or by transference to man of equine disease.

31.—NOTTINGHAMSHIRE.

(22 districts; 20 Medical Officers of Health.)

Nottingham.

Replies received from 16 districts or divisions. Of these Mansfield R. is reported free, and in six other districts it is doubtful whether there was any extensive prevalence.

Extensively prevalent in and around Nottingham, where up to March 8th it had been the certified cause of 18 deaths, and the probable cause of a large excess over previous years of deaths from bronchitis and pneumonia (page 275).

The county was attacked early, and as in the adjacent one, Lincolnshire, there is evidence pointing to the disease having originated in several village centres.

First observed cases in the different districts occurred in the following months, viz. in November, 1, in December, 9, and in January, 5 (all in first three weeks).

In the northern division of the Newark R.S.D. (in which the chief village is Collingham, in the alluvial valley of the Trent) a case of

Influenza answering to the description in the form of queries occurred on November 1st, though not recognised at the time, and others kept cropping up occasionally afterwards, becoming prevalent on December 24th. "From time to time a complaint similar to this occurs in the district, the only difference being that this is more severe and epidemic." On January 27th it had disappeared, but on February 28th there were a number of fresh cases, attributed to the east winds, and occurring chiefly among men working in the fields.

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In the southern division of the Newark R.S.D. (in which the chief place is Long Bennington, in the valley of the Witham, about 12 miles below Grantham) the Medical Officer of Health reports that ordinary catarrh exists as an epidemic in this district. In three to five days a whole village may be attacked. A few cases of "influenza" characterised by nervous depression, frontal headache, and muscular pains have come under notice, the first being on December 12th, but there was no extensive prevalence of such cases; they occurred in households where ordinary catarrh had existed (in one case, it is mentioned, among the children).

At East Retford the Medical Officer of Health reports (January 18th) that for a month back there had been an unusual prevalence of "feverish colds" with pains in the head, back, and limbs, and in nearly all cases attended with bronchitis, and in one or two with pneumonia. This prevalence commenced at the time when fogs and cold weather prevailed. He did not at first look upon these cases as different from the "ordinary influenza," though other medical men did, but later he came round to the opinion that they were a true Influenza like the epidemics of former years.

In the Retford rural district the Medical Officer of Health reports the first case of typical Influenza as on December 23rd, he does not think the severe form has been very prevalent, though many children had the disease in a mild form.

At Nottingham the epidemic of Influenza was preceded by an unusual amount of catarrh of various kinds, of rheumatism, bronchitis, and pneumonia.

At Warsop the Medical Officer of Health reports only the natural prevalence of "bad colds," due to carelessness and variable weather, until February 22nd when he reports an epidemic of Influenza marked by nervous prostration.

At Worksop the first case was contracted in London.

Several Medical Officers of Health attribute the disease to atmospheric conditions,—cold, fogs, east winds, sudden changes; but Medical Officer of Health of Nottingham, says: Meteorologic variations, though closely watched, do not appear to have affected its prevalence. He considers the disease spread by personal contagion, especially where large numbers of persons are closely aggregated in confined air; but mentions its occurrence among people isolated in the scarlet fever hospital.

Horses in several districts reported to have suffered from "influenza."

The Medical Officer of Health for the south division of the Newark R. district reports cases in which it was communicated from horses to men. In Carlton "influenza" was thought to be contracted by a calf from a man.

32.—DERBYSHIRE.

(35 districts; 32 Medical Officers of Health.)

Replies received from 24 districts or divisions of districts.

The progress of the epidemic in this county is difficult to understand, perhaps on account of the different views of different observers as to what Derby.

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constitutes "Influenza." Thus one observer at Chesterfield reports that that neighbourhood was free from Influenza until January 29th, on which day a wave of the disease passed over affecting a large proportion of the inhabitants; another at the same place reports the first observed case in second week of December and the disease prevalent by December 31st or January 1st.

Four districts are reported free, but three of them only up to January 18th, and in one information of the presence of the disease comes from another source. One return gives no information.

Dates of first observed cases were in December in five districts, namely:—

Second week in December.—Chesterfield, or neighbourhood, as above.

December 18th.—Rowsley, among railway employés, supposed to have been imported from Leicester (where, however, Influenza is not reported to have existed at that time).

December 20th.—Glossop, New Mills.

December 21st.—Shardlow

In 12 districts, the first case was recognised in January, and in two not till the middle of February, viz., Buxton and Derby; in both the latter the cases were generally mild. Introduced from London in Ashbourne, R.; by railway employés at Rowsley; by commercial travellers and others at Long Eaton.

Not many Medical Officers of Health consider the disease infectious; most either express no opinion, or attribute it to atmospheric causes, (miasma, cold winds, fogs, continued wet weather).

Special incidences noticed in certain districts, on schools, railway men, business people; at Buxton on working men and servants. At the Devonshire Hospital [a building in which all the wards communicate with a central dome], the servants were attacked and not the patients. In Ashbourne R., damp localities; at Matlock high ones were thought to be most affected.

Horses suffered from catarrhal symptoms in three or four districts; cows also at Ashbourne.

VIII.—NORTH-WESTERN COUNTIES.

33.—CHESHIRE.

(47 districts; 29 Medical Officers of Health.)

Cheshire.

Replies relating to 38 districts.

Cheshire seems to have escaped lightly: in 12 districts there is stated to have been no Influenza, and in many others there is no history of extensive prevalence. But a number of districts are combined respectively under two Medical Officers of Health whose sources of information as to Influenza seem to be limited to death returns. Also the districts reported free are so reported in January, and not week by week; they may therefore have been attacked later.

Cases seem to have been numerous in Macclesfield, Congleton, and Yeardley-cum-Whaley, all in the hilly country on the south-east side of the county.

The county generally seems to have been invaded comparatively late; early cases, however, are reported at Altrincham (November or December); Congleton (November 17th); Crewe (beginning of December); and Reddish (December 8th); these do not seem to have presented marked symptoms, and were perhaps only ordinary catarrhs which in some districts are stated to have been very prevalent. Prevalence of the disease began January 10th at Congleton, end of January at Macclesfield, and in other districts about middle of February.

In some districts (Altrincham R. and U., Runcorn) introduced from London; at Sale supposed to be contracted by letters from France or Germany. At Cheadle, men engaged in Manchester were the first, and sometimes the only ones in a household to suffer. Some Medical Officers of Health consider the disease to be infectious; others attribute it to climatic causes or aerial poison; many again express no opinion.

No "influenza" among horses is mentioned; in Congleton and Wallasey they are expressly stated to be very free. Dogs, &c. attacked with symptoms of "influenza" at Altrincham and Bowdon, in one case before members of the family.

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34.—LANCASHIRE.

(151 districts; 140 Medical Officers of Health.)

Replies from 107 districts or divisions.

Lancashire.

Lancashire was reached by the Influenza epidemic late and seems to have been affected in general but slightly.

In 16 districts (except Blackburn, rural or smaller urban districts) Influenza is reported as entirely absent. In others there is reported only a prevalence of catarrhs, bronchitis, and "ordinary influenza," and in a good many of the districts in which cases of the type described have been observed they have been few in number, and have not amounted to an extensive prevalence.

It has been widely prevalent in several large towns as Bolton, Preston, Oldham, and Wigan, also at Lancaster and Lytham.

No information comes from Liverpool, Bury, and Rochdale.

Reports as to Manchester and Salford are appended, pp. 280-283.

There seems to have been during the winter an unusual prevalence of catarrhs, by some spoken of as "epidemic catarrh," of affections of the respiratory organs, and of "common Influenza," and among these cases have been a few with severer symptoms resembling the "Russian influenza." In several districts after a prevalence of such catarrhs there has been a sudden marked change of type, and Influenza proper has become prevalent. This change has taken place about the end of January, or in the middle of February, *e.g.*, at Accrington, middle February; Ashton-in-Makerfield, February 12th; Aspull, February 12th; Bolton, February 15th; Burnley, February 2nd; Clitheroe R., February 18th; Kersley, February 10th; Lees, February 11th; Southport, February 15th.

Few early dates are given. Medical Officer of Health, Lancaster, reports cases of "influenza" some time in November, but nervous depression not very great, and attacks rare until about January 11th.

Medical Officer of Health for Orrell and Upholland reports cases in December (variously given in different replies as beginning, middle, and end of December), but there was no extensive prevalence at any time.

Medical Officer of Health, St. Anne's-by-the-Sea, reports first case about beginning of December, and extensive prevalence about December 12th. The symptoms have been those of "ordinary epidemic Influenza," but the epidemic has not been a severe one. Gastric symptoms most common. A doubtful case in the adjoining district of Lytham, December 10th.

[The "Lancet," April 19th, 1890, states that the Influenza epidemic was late in arriving at Manchester, but was as extensive there as elsewhere.]

On December 5th, a sailor at Fleetwood, on a vessel from Glasgow, had "influenza," but no epidemic followed there.

Dates of commencement about end of December or beginning of January in several districts, mostly near Manchester, Liverpool, and

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Blackpool. In others later in January or February. A great extension of the disease took place about the middle of February, freshly appearing in some districts, and becoming prevalent and typical in others, in which only scattered or doubtful ones had previously existed.

Few instances of introduction given.

Medical opinion preponderates in favour of atmospheric origin, especially mild damp changeable weather, but this opinion may refer to the prevalence of ordinary catarrhs rather than epidemic Influenza. Many Medical Officers of Health, however, recognise the disease as infectious when introduced into a household, or a place where many people are congregated at work.

No special incidence upon any class generally observed.

"Influenza" among horses noted in several districts, and Medical Officers of Health, Oldham, and Ormskirk R., and Ulverston R., give instances in which it was supposed to be communicated to men. In the majority of districts no special disease of animals noticed.

IX.—YORKSHIRE.

35.—WEST RIDING.

(168 districts; 128 Medical Officers of Health.)

Yorkshire.

West Riding.

Replies received relating to 104 districts or divisions.

Of these, 29 are returned as free from Influenza up to date of report or only affected by catarrhs indistinguishable from those of former years, and not especially frequent. Some of these districts are reported free to March, but of the majority the information only comes down to January, and some of them may have been attacked later. In some of these districts too the occurrence of Influenza is alluded to by Medical Officers of Health of other districts. In 21 districts there had been no extensive prevalence of Influenza up to date of last return, and in 15 others the replies leave it doubtful whether there was any such prevalence. In 12 districts only are the cases spoken of as very numerous. The cases too appear, as a rule, to have been mild, and few deaths are mentioned. The Riding therefore appears to have escaped lightly, but the information from the large towns is scanty or none, except from Leeds, as to which see page 277.

Several early dates are given, but most, or perhaps all, of these refer to ordinary febrile catarrh, and not to true Influenza. One Medical Officer of Health has seen cases from the commencement of his practice in 1866, but not more lately than usual. Another states that Influenza, as described, has been endemic in his district for two years (though mistaken for lead poisoning), and gives date of commencement of extensive prevalence as beginning of October; he considers it malarial.

The Medical Officer of Health, Harrogate, speaks of "influenza" as first occurring in his district about the beginning of November, and prevalent since November 25th; it was not characterised by much nervous depression, frontal headache, or muscular pains, but rather by bronchitis and pneumonia, the pneumonic symptoms being the first and most prominent in the majority of cases. It was preceded by a mild epidemic of measles, and it was decidedly infectious. (This was evidently a different disease from the epidemic Influenza, perhaps the pneumonic fever described by Dr. Ballard.) Later however (February 22nd), the Medical Officer of Health records the occurrence in Harrogate of Influenza with the usual characteristics; he considers it to have been imported from Leeds and London, and to have spread by infection.

November 13th.—Barnsley. "Isolated cases answering the description have been met with, but nothing amounting to an epidemic, only what is met with every year to a greater or less extent." Later

Dr. Sadler reports : " Since February 5th an unusual number of cases of Influenza have been met with in this district, the majority not distinguishable from ordinary febrile catarrh, but many with all the nervous symptoms mentioned."

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November 15th.—Baildon. Prevalent December 1st. The Medical Officer of Health says that those cases which he saw might be described as "ordinary influenza," plus a mild case of pneumonia, and that the disease invariably began after catching cold in a fog. He attributes it to the prevalence of cold foggy weather. [But Dr. Bruce Low suggests that as there is a German colony at Bradford, which is near Baildon, the disease may have been introduced from abroad. See page 240.]

November, last week.—Wortley R.—1st Division (Chapelton). The Medical Officer of Health states that there has been no prevalence of typical Influenza, though there were a few cases before Christmas; he considered them "ordinary influenza."

Last week in November.—Skipton. The Medical Officer of Health states that one medical man positively certifies that he attended cases of Influenza of a distinctive type in the last week of November. These were preceded by a prevalence of ordinary colds. About 100 cases of Influenza occurred in a steady succession through December and January, and in the second week of February there was a decided increase.

December 3rd.—Kirkburton (with characteristic symptoms, began three days after return from London); two other cases contracted from this, but no general spread.

December 16th.—Sowerby Bridge. No extensive prevalence till February 21st.

December 18th (about).—Rawdon. Prevalent December 22nd (about). "Its spread so rapid and universal as to preclude communication from case to case."

At Mexborough, a week before Christmas, first cases among railway employés.

In the other districts first observed between last week of December and beginning of March.

First case in November in	5 districts.
" " December in	12 "
" " January in	23 "
" " February in	20 "
" " March in	2 "
" " uncertain in	13 "
No Influenza recorded in	29 "

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Extensive prevalence, where it followed, did so in 17 districts in a week or under, in 10 not till after the expiration of more than a month. In most districts in which epidemic prevalence occurred, this began in February, declining (where date given) about middle of March.

In Sedbergh R. district, a very secluded district of mountains and dales, Influenza with all the symptoms mentioned began in the end of December, and became prevalent between January 5th and 10th, declining February 5th. Besides the well marked cases there were numerous mild ones without much rise of temperature, and 80 per cent. of the inhabitants of Sedbergh are estimated to have been affected. One infant died. The disease appeared to invade all parts simultaneously,

affecting chiefly people exposed to weather during their work. The weather then was very damp and mild, with little wind.*

History of importation from London, Leeds, and other places in about 10 districts. A few Medical Officers of Health attribute spread of disease wholly, and more partly, to contagion. Others attribute it to atmospheric causes: germ; malaria; changeable weather; mild, calm, damp weather; cold foggy weather; cold east winds.

Nature of locality not observed to have had any influence.

Special incidences observed in different districts upon adult males; upon those exposed to weather; upon those working in crowded factories; upon those working in heat.

At Mexborough, railway employés were first attacked; glass blowers later; and miners and stovemakers later still.

Few instances recorded of disease among lower animals. At Mexborough horses observed to be affected with severe colds at the same time as members of the family. At North Bierley much catarrh and bronchitis among horses, but no human Influenza.

YORKSHIRE.—NORTH RIDING.

(38 districts; 30 Medical Officers of Health.)

North Riding.

Replies received from 28 districts or divisions. The Riding comparatively lightly affected. Six districts reported free to date of last return, and in seven no extensive prevalence.

The earliest dates given for first occurrence are—

End of September, Thirsk R. no extensive prevalence (no other particulars).

At Filey, Medical Officer of Health reports plenty of "common influenza" during the whole winter since November, which he attributes to the very mild and changeable winter. It went through whole households, and he thinks that almost every one in Filey had an attack. It was not different in character from the ordinary disease; the cases were mild and there were no deaths and few complications.

Of the other districts three were attacked in the latter part of December, eight in January, six in February, and one in March, (besides others not stated). Extensive prevalence established about Northallerton and Redcar in middle of January (over at the latter place by February 18th); in other districts began in February or March, abating, where reported, about March 18th.

Previous prevalence of catarrh noted at Aysgarth and Pickering.

Spread from introduced cases at Deighton (Northallerton R.) and Egton (Whitby R.). Few Medical Officers of Health express an opinion as to its causation; of those who do, most regard it as propagated by infection.

The Cleveland ironstone villages were especially attacked. Little mention of diseases among animals. Horses with catarrh at Hinderwell; fowls out of sorts at Filey.

YORKSHIRE.—EAST RIDING (including YORK).

(18 districts; 18 Medical Officers of Health.)

East Riding.

Replies from 13 districts, Driffield U. and York R. reported free by Medical Officers of Health, but from another source information

* The adjoining district to the east, Aysgarth R., which is of similar character, remained free from distinct Influenza till March, but there were many cases of "epidemic catarrh," *i.e.*, ordinary colds which were infectious.

comes of an extensive prevalence of Influenza in the latter district. In five other districts no extensive prevalence reported.

Dates of first observed cases,—November 12th, Patrington, “Mild cases were very prevalent during the last four months of the year, but medical attendance was seldom required; they were spread by infection, though attributed originally to the damp weather.” On November 12th, one case occurred, characterised by nervous depression, frontal headache, and muscular pains; and another on February 1st. No wide prevalence of such cases.

November or December at Langtoft, Driffild R., a secluded village in a hollow among the chalk wolds; whole village affected, especially children. One child died. Attributed to calm stagnant air and dense fogs; rest of district free. [See report by Dr. Bruce Low on page 254.]

Began in December at Flaxton (York R.), abating, but reappearing about January 1st, and extensively prevalent middle of January.

December 16th, Hull. Introduced by infected ship’s crew from Riga, (Russia). In contiguous Sculcoates district about same time.

Of other districts in one first case, December 31st; in three, January; in two, February. Extensive prevalence at Langtoft and Sculcoates in December; at Bridlington not till middle of February. At Hornsea, outbreak deemed too sudden to have resulted from contagion. First case, December 31st; extensive prevalence January 3rd or 4th. Medical Officers of Health of Hull and other districts believe it spread by contagion. At Hornsea outbreak confined to upper and middle classes; outdoor labourers escaping.

At Flaxton, York R., “influenza” very prevalent among horses, and some cases communicated to man; but these presented different clinical features from ordinary cases. Cats, dogs, and rabbits affected in infected households at Bridlington and Sculcoates.

X.—NORTHERN COUNTIES.

38.—DURHAM.

(42 districts; 45 Medical Officers of Health.)

Replies from 39 districts or divisions.

Durham.

Prevalent in most districts; its presence denied in Darlington R. (February 4th), Felling, Gateshead, and Hartlepool (present, but not extensively prevalent in West Hartlepool).

Date of commencement in most districts first week in January.

Early dates (November) given by Medical Officers of Health of Durham R., Hebburn U., and Teesdale R.S.D. (but in Weardale not till February).

Prevalent in January in most districts, but not till February in Felling, Stockton, and Weardale.

Medical opinion about equally divided between atmospheric causes (of varying nature) and infection; some hold both.

In some instances history of importation.

In some districts, *e.g.*, Sunderland, there was a general invasion at one date; in others, *e.g.*, Sedgefield R., the disease was confined to certain localities, others escaping. Special incidence on limestone quarrymen at Stanhope; on steel workers at Wolsingham; on colliers at Trimdon in Sedgefield R. Men generally attacked first (exception at Lanchester).

Catarrhal symptoms in some places were noticed among horses, dogs, and cats, and Medical Officers of Health, Durham R. and Sunderland R., believe that such disease was communicated from lower animals to men.

Absence of disease in animals, although human Influenza was present, is noted at Durham U., Hebburn U., Hetton-le-Hole, Sedgefield R., Stanhope, Stockton, Sunderland, Wolsingham.

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39.—NORTHUMBERLAND.

(32 districts; 28 Medical Officers of Health.)

Replies from 26 districts or divisions.

The populous districts near the Tyne were extensively affected, but the northern and sparsely populated part of the country lightly.* No place is reported as having escaped, but Medical Officer of Health, Alnwick, reports merely prevalence of catarrhs without any special characteristics.

Dates.—Early in December, Blyth, but only “the ordinary ‘influenza’ which prevails in this district annually in the winter months” and not extensively prevalent.

December 15th.—Newcastle, first among sorting clerks at post office.

Middle of December, at Willington Quay.

December 19th.—Glendale R. December 20th, Berwick.

Other places at various dates up to February 10th, Bellingham.

The disease extensively prevalent in Newcastle by January 7th.

No extensive prevalence in six districts. In eight disease extensively prevalent within a week after first known cases; in eight others followed after intervals of one to six weeks.

Many Medical Officers of Health attribute disease to climatic causes, mild damp changeable weather, though several recognize it as more or less infectious.

No history of importation from abroad or other parts of England, unless it be the post office clerks.

Catarrhal disease among horses in several districts.

40.—CUMBERLAND.

(23 districts; 20 Medical Officers of Health.)

Cumberland.

Cumberland has not been early, nor very severely affected. Bootle and Workington are reported free. Brampton R. and Millom districts appear to have been severely affected.

Catarrhs are noted to have been prevalent in some districts, (*e.g.*, Cleator Moor and Whitehaven).

No early dates; the first December 28th or 29th at Millom. In most districts the first case occurred at some date in January, but the disease was not prevalent till the end of January or February. At Egremont appeared first about middle of February, and epidemic in March.

Introduced at Keswick by letters from London, at Maryport from Edinburgh, and at Wigton R. one case was believed to have been contracted at a ball in another district; another came from Glasgow.

Medical Officer of Health, Brampton R., attributes the introduction of Influenza to people going to Carlisle where the epidemic had prevailed for some time previously, and its spread entirely to infection. Medical Officer of Health, Cleator Moor, ascribes disease to cold weather, but most offer no opinion as to its cause.

“Influenza” among horses mentioned only at Penrith (a single case). Cats at Keswick said to have been ill before the outbreak.

41.—WESTMORELAND.

(10 districts; 2 Medical Officers of Health.)

Westmoreland.

Return from Kirby Lonsdale U. only. The rest of county under a Medical Officer of Health who has not replied.

In Kirby Lonsdale a few cases have occurred marked by symptoms of Influenza; the first, February 15th, attributed to chill.

[It was prevalent in Kendal, but the prison escaped. See page 175.]

* The “Lancet,” April 19th, 1890, reports a high death-rate in Morpeth in March, due to the Influenza epidemic.

XI.—WELSH.

42.—MONMOUTHSHIRE.

(25 districts; 32 Medical Officers of Health.)

Replies from 28 districts or divisions.

The county generally and severely attacked, especially the mining and manufacturing towns. Only the small districts of Marshfield and Henllis are reported to have escaped. Earliest dates.—December 11th. Easter, Magor, (? specific); December 14th, Nantyglo and Blaina U.

In end of December at Newport, Monmouth, and Mynyddislwyn.

In all other districts first case some date in January, extensive prevalence soon following. At Newport epidemic over by January 25th. At Pontypool and Nantyglo a recrudescence second week in February.

Young adult males generally earliest affected. Post office staff early and severely at Newport. In some places lower class before those better off.

At Monmouth, introduced from London; in several other places from Newport, which formed a centre of diffusion of disease to surrounding districts. General course from lower ground up the valley. Atmospheric conditions mentioned, damp mild foggy weather, sudden changes, south-westerly gales. Opinions divided as to infectiousness, distinct history of spread from imported case in some districts. In others disease said to have begun simultaneously at several points. Many medical men have suffered.

Previous prevalence of "influenza" among horses in Llanfrechfa and Mynyddislwyn. In other districts single cases among horses at time of human epidemic.

43.—SOUTH WALES.

(1.)—GLAMORGANSHIRE.

(26 districts; 34 Medical Officers of Health.)

Replies from 21 districts or divisions, and incidental information as to Glamorgan. another.

This county was severely attacked, especially the large industrial and commercial centres.

Cardiff and Penarth, Neath and Cadoxton, and Swansea all first attacked in last week of December, extensive prevalence following in first week January, and being over in some by the beginning of February.

The other districts and divisions from which returns have been received all attacked between January 1st and 18th, extensive prevalence following in a week or two in most. No district reported free, though no extensive prevalence occurred in Cowbridge, Oystermouth, and Llanfabon. Aberdare, Cardiff, Cadoxton, Mountain Ash, Swansea and Ystradyfodwg severely attacked.

Previous prevalence of catarrhs noted at Morryston.

Several Medical Officers of Health give histories of the disease being imported into their district, and spreading by infection. Cardiff seems to have acted as a centre from which the disease spread to surrounding districts. At Cardiff and Swansea the post office officials early and severely affected. Some instances of introduction by shipping.

Some Medical Officers of Health attribute disease to atmospheric poison. Medical Officer of Health, Ystradyfodwg, mentions mild close damp foggy weather; Medical Officer of Health, Swansea, great daily range of temperature with cold nights as coincident with height of disease.

In several districts men were especially attacked.

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Monmouth.

In some districts preference noted for low-lying damp localities (but these are generally nearest to railway and sea communications); in others all localities have alike suffered.

A prevalence of "influenza" or catarrh among horses and cows occurred in several districts prior to the epidemic. Concurrent cases of illness noted among cats and rabbits.

(2.)—CARMARTHENSHIRE.

(10 districts; 14 Medical Officers of Health.)

Carmarthen.

Replies from 13 districts or divisions.

Influenza very prevalent at and about Llanelly, especially among tin-plate workers, also in Cenarth and Llandyssil divisions of Newcastle Emlyn Union. Llandovery U. and R., and three divisions of Carmarthen R., escaped, and others slightly affected.

Earliest date. Llanelly, middle of December, prevalent middle of January; other places in January. Two divisions of Carmarthen R. attacked in February and one in March. Prevalence where it occurred soon followed.

In Carmarthen and Cenarth Influenza epidemic followed a prevalence of ordinary colds.

In two districts supposed to have been introduced by letters or newspapers; in others, cause doubtful. In three districts prevalence of "influenza" among horses is said to have preceded the human epidemic.

(3.)—PEMBROKESHIRE.

(7 districts; 12 Medical Officers of Health.)

Pembroke.

Replies from 10 districts or divisions.

Not early affected, nor apparently severely, except Pembroke, where the disease prevailed extensively among the dockyard men. Fishguard and St. David's U. reported free.

First,—December 30th, at Milford, where introduced into a shipyard by men returning from Christmas holidays in England. January 4th, at Haverfordwest R. (where, however, Medical Officer of Health considers disease endemic, and thinks that he saw an outbreak two years ago, and had it himself in October 1889). About January 20th, at Begelly, Whitland, Tenby, and Pembroke. February 8th, St. David's Rural District. Prevalence followed one to two weeks after first case.

History or probability of importation of disease in most of the districts in which it occurred.

One Medical Officer of Health thinks that the disease increased, another that it diminished, in dry frosty weather.

School children in some districts much affected.

Catarrh and strangles in horses are in several districts reported as having preceded or accompanied Influenza epidemic.

(4.)—CENTRAL WALES.

(22 districts; 26 Medical Officers of Health.)

Central Wales.

Little affected, and not early.

No returns from Radnorshire, and only from Brecon R. in Breconshire, where Influenza appeared January 4th, but does not seem to have attained extensive prevalence. In Cardiganshire answers from eight districts or divisions; two reported free, the others attacked at dates between January 9th (Cardigan, where, however, only four cases

occurred, the first being thought to be contracted from a cat) and February 3rd. No district seems to have suffered very largely.

At Newquay disease imported January 15th by sailors from Dunkirk.

No disease among animals except in the case of the cat above-mentioned.

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44.—NORTH WALES.

(54 districts; 45 Medical Officers of Health.)

Replies relate to 33 districts or divisions.

North Wales.

Most parts affected with Influenza, but in few apparently has it been very prevalent or severe.

No report from Anglesey, except the part in Carnarvon Union where a case was imported from Chester on January 19th. Absence reported from Hawarden, Denbigh, Cerrig-y-Druidion, and Caersws.

Began in middle of December at Rhyl, Conway, and Pwllheli, carried from latter place to Bardsey Island on January 1st, most of the islanders being attacked in a few days. In several other places began about Christmas (Carnarvon, Llanfairfechan, Barmouth, Llanfyllin). In more instances the first case was noticed some time in January. The disease seems to have occurred latest in neighbourhood of Ruabon, *e.g.*, Llangollen, February 7th; Ruabon, February 8th; Hope, February 17th.

Prevalence when it followed, usually did so in one to three weeks after the first case; in most places at some time in January.

At Welshpool an imported case about January 8th. No direct extension; a succession of scattered cases only until March 1st, when they became numerous.

At Bala disease first observed in beginning of January, and then prevalent to some extent but declined, becoming prevalent again about the middle of February.

In many districts a history of importation, generally from London, and spread by contagion. At Llanfyllin introduced by parcel from a West-end shop where Influenza prevailed, and spread among churchgoers; at Conway and Llanfairfechan by letters. At Llanegryn division, Dolgelley R., the manager of a slate quarry contracted disease in London and communicated it first to his household and then to his work-people; extensive prevalence following. In Mallwyd division of the same district five cases occurred simultaneously in different households without apparent connexion.

Some medical men attribute Influenza to wet and cold weather, others to specific poison in air.

No constant incidence. At Conway, Llanfairfechan, and Bala, upper classes first; at Llandwrog and Wrexham labouring class chiefly affected; at Machynlleth children first, in other places children have escaped.

Cases of "influenza" among horses have been observed in some districts before the human epidemic; but as a rule epizootics have not been observed.

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VIII.—THE INFLUENZA EPIDEMIC OF 1889-90 AS IT AFFECTED THE PUBLIC SERVICES.

INFLUENZA IN THE ARMY ON HOME SERVICE.

The following particulars are derived from weekly returns of Influenza cases in Her Majesty's regular troops at home stations, and other information obligingly furnished me by the Director-General of the Army Medical Department.*

The weekly returns were made out up to Friday morning in each week, and were continued up to May 9th, 1890.

"Influenza" in
ordinary years.

Before speaking of the epidemic of 1889-90 it may be well to mention to what extent "influenza" figures as a cause of sickness in the Army on home service in ordinary years.

In 1885 73 cases of "influenza" were returned, chiefly in the North British (Scotland) and Home (London) districts.

In 1886 89 cases were returned, mostly in the North British and Belfast districts.

In 1887 there were 51 cases of "influenza;" mostly in the Northern and Belfast districts.

In 1888 there were 49 cases returned as "influenza," these were scattered generally over the United Kingdom.

In 1889-90.

The late Influenza epidemic first made its appearance in the Army on home service towards the end of December 1889, and attained its height in the middle of January; it had greatly declined at most stations by the end of January, but a few cases still continued to occur week by week up to May.

Many stations
escaped.

It was not universal, however, for at 45 military stations in the United Kingdom, having in the week ending January 10th, 1890, an aggregate average strength of 14,102, viz., 345 officers, 9,236 non-commissioned officers and men, 1,437 women, and 3,084 children, no cases of Influenza were reported to have occurred up to May 9th, 1890.

The list of these stations is as follows:—

ENGLAND AND WALES, 25 Stations. (Strength 9,197.)	Warrington.
Derby.	Warwick.
Halifax.	Brecon.
Leicester.	Bristol and Severn defences.
Lincoln.	Christchurch.
Newcastle-on-Tyne.	Chichester.
Pontefract.	Kingston-on-Thames.
Richmond (Yorks).	Reading.
Sheffield.	
Tynemouth.	SCOTLAND, 5 Stations. (Strength 1,132.)
Birmingham.	Ayr.
Burnley.	Fort George.
Bury.	Leith Fort.
Chester.	Inverness.
Coventry.	Stirling.
Fleetwood.	
Liverpool.	ISLE OF MAN, 1 Station. (Strength 44.)
Shrewsbury.	

* I wish also to acknowledge the courteous assistance which I have received from Brigade Surgeon W. Nash, M.D., of the Army Medical Department, in this portion of my inquiry.

IRELAND, 14 Stations. (Strength 3,729.)

Downpatrick.	Kilrush.
Newtownards.	Roscrea.
Dunfanaghy.	Kinsale.
Dundalk.	Templemore.
Birr.	Tipperary.
Tullamore.	Waterford.
Fort Anne.	Youghal.

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At most of the stations which escaped, the strength is comparatively small, but it will be seen from the above list that many of those in England were at populous towns, in some of which Influenza is known to have prevailed extensively, *e.g.*, at Coventry, where the Medical Officer of Health estimates that 40 per cent. of the civil population suffered from it, and where also the barracks are situated in the centre of the town.

It will be seen that in England the stations which escaped were mostly in the North and Midlands. Scotland escaped too more lightly than England, for while 5 out of 14 stations in Scotland escaped, or more than one in three, in England and Wales 25 out of 106, or less than one in four, escaped.

The Northern and Scotch stations, too, which did not altogether escape, were as a rule comparatively lightly affected.

At 122 stations* Influenza is reported to have occurred; the dates at which they were attacked being as shown in the following table†:—

STATIONS attacked by INFLUENZA.

Stations
attacked.

In Week ending	England and Wales.	Scotland.	Ireland.	Channel Islands.	Total.
December 27, 1889 -	3	1	—	—	4
January 3, 1890 -	10	2	1	1	14
" 10 " -	33	4	12	—	49
" 17 " -	13	1	11	1	26
" 24 " -	2	—	6	1	9
" 31 " -	2	1	4	—	7
February 7 " -	3	—	5	—	8
" 14 " -	1	—	1	—	2
" 21 " -	1	—	—	—	1
" 28 " -	—	—	—	—	—
March 7 " -	—	—	—	—	—
" 14 " -	1	—	—	—	1
" 21 " -	—	—	—	—	—
" 28 " -	—	—	—	—	—
April 4 " -	—	—	—	—	—
" 11 " -	—	—	—	—	—
" 18 " -	—	—	—	—	—
" 25 " -	1	—	—	—	1
May 2 " -	—	—	—	—	—
" 9 " -	—	—	—	—	—
Total - -	70	9	40	3	122

The stations attacked before or on December 29th were Dover Western Heights, Sheerness, Gravesend, and Aberdeen; and before the end of December Canterbury, Hounslow, Warley, and five barracks in London

* The 11 barracks in London are reckoned in the weekly returns as one station.

† The dates in this table are taken from daily returns sent in by the medical officers locally in charge. These returns from various causes, *e.g.*, by including cases in persons who are not "on the strength," do not always exactly tally with the weekly returns. Thus the case which occurred at Aberdeen on December 27th is not included in the return for the week ending on that day.

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were attacked; also Dublin and two barracks in Edinburgh. All the stations in England attacked in December, it will be observed, were in the south-eastern counties, and those in Scotland and Ireland on the east coast of those portions of the United Kingdom.

The English stations not attacked until February were Trowbridge, Dorchester, Preston, Lichfield, and Beverley; the one in March, Lancaster; and the one in April, Strensall, near York, all these stations later attacked being in the west or north of England.

Of the military stations in the British Islands the first to be attacked with Influenza was Dover Western Heights, where cases occurred on December 21st in the household of an officer, the disease being believed to have been introduced by children returning from school in London. The epidemic developed itself at Dover first among the troops at the Western Heights, and afterwards among the civil population. The troops in Dover Castle, separated from the Western Heights by an intervening valley, were not attacked till January 10th, and then only three cases occurred there.

The following tables show the numbers of new cases occurring weekly during the time that the epidemic lasted:—

INFLUENZA CASES IN ARMY ON HOME SERVICE.

—		Officers.	Non-com- missioned Officers and Men.	Women.	Children.	Total.	Deaths.
Approximate strength at affected stations -		3,451	87,133	8,952	17,560	117,096	
Approximate	total						
strength	-	3,796	96,369	10,389	20,644	131,198	
In week ending—							
December 27	-	8	8	1	4	21	—
January 3*	-	?	206	?	?	206	—
„ 10	-	90	2,706	107	131	3,034	—
„ 17	-	64	1,749	124	252	2,189	3
„ 24	-	34	743	108	139	1,024	3
„ 31	-	29	459	67	71	626	1
February 7	-	14	248	43	45	350	1
„ 14	-	13	162	20	24	219	—
„ 21	-	8	89	21	12	130	—
„ 28	-	8	58	10	6	82	—
March 7	-	4	36	8	2	50	—
„ 14	-	6	43	2	2	53	1
„ 21	-	2	21	2	1	26	—
„ 28	-	2	22	1	3	28	—
April 4	-	1	13	1	5	20	—
„ 11	-	—	10	1	2	13	—
„ 18	-	—	7	—	1	8	—
„ 25	-	—	9	—	—	9	—
May 2	-	1	8	—	—	9	—
„ 9	-	1	5	—	—	6	—
Total	-	285	6,602	516	700	8,103	9
Per-centage to strength at affected stations -							
	-	8·3	7·6	5·8	4·0	6·9	·008
Per-centage to total strength -							
	-	7·5	6·9	5·0	3·4	6·2	·007

* The return for the week ending January 3rd is unfortunately incomplete, but the number of cases among officers women, and children was at any rate very small.

	England and Wales.	Scotland.	Ireland.	Channel Islands.	Total.
Approximate strength at affected stations - -	86,115	4,276	25,205	1,500	117,096
Approximate total strength -	95,312	5,408	28,934	1,500	131,198*
In week ending					
December 27- - -	21	—	—	—	21
January 3 - - -	191	5	10	—	206
„ 10 - - -	2,507	30	497	—	3,034
„ 17 - - -	1,557	25	568	39	2,189
„ 24 - - -	625	21	359	19	1,024
„ 31 - - -	331	6	279	10	626
February 7 - - -	215	11	113	11	350
„ 14 - - -	143	6	51	19	219
„ 21 - - -	94	3	28	5	130
„ 28 - - -	69	—	11	2	82
March 7 - - -	39	1	10	—	50
„ 14 - - -	44	2	7	—	53
„ 21 - - -	21	—	5	—	26
„ 28 - - -	24	—	4	—	28
April 4 - - -	18	1	1	—	20
„ 11 - - -	9	—	4	—	13
„ 18 - - -	7	—	1	—	8
„ 25 - - -	9	—	—	—	9
May 2 - - -	8	—	1	—	9
„ 9 - - -	6	—	—	—	6
Total - - -	5,938	111	1,949	105	8,103
Per-centage to strength at affected stations - -	6·9	2·6	8·0	7·0	6·9
Per-centage to total strength	6·2	2·05	6·9	7·0	6·2

* Including 44 in the Isle of Man.

The proportion of Influenza cases to strength has varied considerably in the different parts of England and Wales, being highest in the Eastern Counties and those around London, low in the West, and lowest of all in the North, as shown in the following table :—

Relative proportions attacked in different parts of England;

PROPORTION of INFLUENZA CASES to 100 STRENGTH in ENGLAND and WALES.

Military Districts or Groups of District.	Comprising	Per-centage of Influenza Cases	
		To Strength at affected Stations.	To Total Strength in Districts.
Eastern - - -	Eastern counties and Northamptonshire.	10·3	10·3
Home - - -	London and neighbourhood.	9·7	9·3
London station - - -	London only - - -	8·1	8·1
South-Eastern, Thames, and Woolwich.	Kent and Sussex - - -	6·9	6·9
Southern - - -	Hants, Wilts, Dorset - - -	7·3	6·9
Aldershot - - -	Aldershot - - -	5·7	5·7
Western - - -	West of England and South Wales.	4·2	3·8
North-Eastern and North-Western.	North of England, Midland countier, and North Wales.	2·7	1·6

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and Ireland.

Ireland is divided into three military districts, that of Belfast comprising the province of Ulster, that of Dublin, Leinster and Connaught, and that of Cork, Munster.

If we separate Dublin from the rest of the Dublin district, we see that the relative proportions in which the troops in the several parts of Ireland have been attacked with Influenza are curiously similar to those in Great Britain, the proportion being highest in the east and at the capital, and high in the south, lower in the midland and western counties, and lowest of all in the north.*

PROPORTION of INFLUENZA CASES to 100 STRENGTH in IRELAND.

Military District.	Per-centage of Influenza Cases	
	To Strength at affected Stations.	To Total Strength in Districts.
Dublin (station) - - - -	11·8	11·8
Rest of Dublin District - - - -	5·9	5·3
Total Dublin District - - - -	8·3	7·9
Cork - - - - -	10·0	7·8
Belfast - - - - -	1·8	1·5
All Ireland - - - - -	8·0	7·0

From the foregoing tables we see—

1. That the rise of the epidemic was very much more rapid than its decline.
2. That the acme was reached a week earlier in England and Scotland than in Ireland and the Channel Islands; in the two former the greatest number of cases occurring in the week ending January 10th, in the two latter in that ending January 17th.
3. That the proportion of cases to the strength at the affected stations was 69 per 1,000; in Ireland the proportion was somewhat above the average for the whole United Kingdom, and in Scotland much below it.
4. That officers and men were attacked most numerously about a week earlier than women and children; the greatest number of cases in the two former classes being in the week ending January 10th, in the two latter in that ending January 17th.
5. That officers suffered in larger numerical proportion than non-commissioned officers and men; that these suffered in larger proportion than women; and women than children.
6. That the mortality ascribed directly to the epidemic was very small, being only 9 (8 men and 1 child), or at the rate of 77 per million strength at the affected stations, or 1·1 per 1,000 cases.

(This small mortality is probably to be attributed to the bulk of the cases being in persons of ages at which the mortality from Influenza is low: also to the opportunities which in the Army the patients possessed for securing rest and early treatment. It is to be observed, however, that only the direct mortality from Influenza is here given, and not the indirect mortality, which is usually far higher.)

The returns made in the early part of the period are not sufficiently complete to enable the first stages of the development of the epidemic

* The report of the Local Government Board for Ireland previously quoted (page 13) does not show a similar low incidence on Ulster as regards the class of the population requiring poor law medical relief.

General state-
ments.

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Station Strength.	Canter- bury, 1,846.	Nor- wich, 795.	York, 2,846.	Devon- port, 5,581.	Ports- mouth, 2,998.	Hilsea,* 419.	Wrex- ham, 327.	—	Dor- chester 432.	
New cas e Before Jan. 6	1 (Dec. 30)	—	—	—	—	—	—	Before Feb. 1	—	
Jan, 6	6	—	—	} 9	} 10	—	—	Feb. 1	—	
" 7	3	—	—			—	—	—	" 2	—
" 8	19	10	—			—	—	—	" 3	11
" 9	6	12	—	} 4	} 8	—	—	" 4	3	
" 10	17	11	5			—	—	—	" 5	3
" 11	16	} 4	} 1	—	4	—	—	" 6	5	
" 12	3			5	3	8	—	—	" 7	4
" 13	10	1	2	—	4	—	—	" 8	3	
" 14	13	—	—	3	10	—	—	" 9	—	
" 15	9	2	3	1	4	—	—	" 10	—	
" 16	—	4	8	2	3	—	—	" 11	—	
" 17	5	—	6	10	18	—	—	" 12	5	
" 18	—	—	4	3	1	—	—	" 13	—	
" 19	—	4	4	2	9	—	—	" 14	—	
" 20	—	1	9	5	5	—	—	" 15	—	
" 21	—	4	2	11	2	—	—	" 16	—	
" 22	—	6	—	2	17	—	—	" 17	—	
" 23	—	4	2	7	4	—	5	" 18	—	
" 24	—	—	2	13	3	—	2	" 19	—	
" 25	—	1	—	6	2	—	1	" 20	—	
" 26	—	—	—	8	1	9	1	" 21	—	
" 27	—	3	—	3	4	5	1	" 22	—	
" 28	—	5	3	—	5	2	3	" 23	—	
" 29	—	6	1	—	2	7	2	" 24	—	
" 30	—	2	2	3	6	3	—	" 25	—	
" 31	—	4	—	—	3	—	1	" 26	—	
Feb. 1	—	3	2	—	1	—	1	" 27	—	
" 2	—	—	—	—	—	—	—	" 28	—	
" 3	—	3	—	9	1	—	—			
Subse- quently.	No more cases.	A few cases till March 28.	A few cases again in March.	A suc- cession of cases till May 9.	Cases occurred in lessen- ing num- bers till April 18.	No further cases.	Other cases till Feb. 21.			

(Cases continued till March 7.)

* Hilsea is close to Portsmouth.

It will be seen that the onset of the epidemic was sudden at some stations, as at Shorncliffe, Norwich, Hilsea, and Dorchester, but at others, as at Woolwich, Canterbury, Dover, and Devonport, its progress was more gradual.

The duration of the epidemic varied considerably at different stations, at some there was a short sharp outbreak over in 2, 3, or 4 weeks; at others there was a succession of cases for 12, 13, or 14 weeks. At Caterham, where the epidemic had almost died out, it suddenly recommenced with 14 cases on March 13th and lasted as long as the returns were made. The cases first attacked in this recurrence were men who had been on the strength of the Depôt for some time, certainly during the previous outbreak in January, many of them

Duration at
different
stations.

indeed having then suffered from it. Influenza was prevalent in March among the civil population in the neighbourhood of the barracks. The epidemic lasted longer, as one would expect, at the larger than at the smaller stations, and at those where the cases were numerous than at those where there were only a few, but its duration did not depend wholly on its severity, for at some of the stations where the per-centage of cases to the strength has been greatest, the epidemic has been soon over, *e.g.*, at Brighton, Carlow, and Duncannon Fort.

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The following table shows the numerical strength, the proportion attacked with Influenza, and the duration of the epidemic at certain stations. Those bracketed together are stations which, while comparable in strength and in the proportion attacked, are in contrast as regards the duration of the epidemic:—

Stations.	Strength.	Influenza Cases.	Per cent. attacked.	Duration of Epidemic Weeks.
{ Aldershot - - -	16,153	924	5·7	7*
{ Woolwich - - -	7,855	587	7·5	14†
{ Colchester - - -	3,192	427	13·4	6†
{ Portsmouth - - -	2,998	192	6·4	13
{ Shorncliffe - - -	2,916	156	5·3	5
{ Devonport - - -	5,581	201	3·6	13
{ Brighton - - -	445	93	21·0	3
{ Norwich - - -	795	153	19·2	12‡
{ Northampton - - -	418	21	5·0	3
{ Bury St. Edmunds - - -	404	32	7·9	7
{ Canterbury - - -	1,846	110	6·0	3
{ Chatham - - -	3,926	235	6·0	12
{ Hilsea - - -	419	25	6·0	2
{ Wrexham - - -	327	24	7·9	5
{ Trowbridge - - -	155	20	12·9	2
{ Dorchester - - -	432	50	11·6	5
{ Limerick - - -	1,274	121	9·5	
{ Fermoy - - -	1,290	150	11·7	13
{ Carlow - - -	135	37	27·4	3
{ Tralee - - -	208	62	29·8	7
{ Castlebar - - -	245	31	12·6	2
{ Ballincolig - - -	450	38	8·4	9†
{ Windsor - - -	1,361	170	12·4	4
{ Hounslow - - -	1,837	186	10·1	8
(Other examples of long duration.)				
{ Sheerness - - -	683	64	9·4	11
{ Great Yarmouth - - -	274	24	8·8	10‡
(Highest per-centage.)				
Duncannon Fort - - -	49	23	47·0	3

* Excluding 3 weeks in April and May in which single cases were reported after an interval of 7 weeks free from Influenza cases.

† Including an interval of 1 week without new cases.

‡ Do. do. 2 weeks do.

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A priori the epidemic might be expected to attain its climax and decline sooner where the buildings were closely crowded together on a small plot of ground with many men in one building, than where they were scattered over a wide space, and the men more broken up; in garrisons of which the composition was homogeneous and stable, than in those made up of many different corps and in which changes were frequent; and at stations where there were few women and children than at those where there were many married soldiers with their families. How far these suppositions are borne out by the facts, I do not know. The following figures showing the proportion of women to 100 non-commissioned officers and men at the several stations in the above list scarcely support the view that the epidemic was slower in its course at stations where there were many married soldiers.

WOMEN TO 100 NON-COMMISSIONED OFFICERS AND MEN.

Epidemic soon over.			Epidemic of long Duration.		
Aldershot -	-	8.5	Woolwich -	-	11.9
Colchester -	-	8.3	Portsmouth -	-	11.0
Shorncliffe -	-	8.3	Devonport -	-	9.2
Brighton -	-	12.4	Norwich -	-	4.6
Northampton -	-	24.4	Bury St. Edmunds -	-	19.4
Canterbury -	-	9.8	Chatham -	-	9.3
Hilsea -	-	11.0	Wrexham -	-	21.7
Trowbridge -	-	7.7	Dorchester -	-	16.7
Limerick -	-	12.6	Fermoy -	-	9.2
Carlow -	-	23.0	Tralee -	-	15.2
Castlebar -	-	10.5	Ballincolig -	-	14.1
Windsor -	-	8.6	Hounslow -	-	15.1

In few of the daily returns is any definite opinion expressed as to the origin of the disease.

At Dover, as already mentioned, there is a history of introduction from London.

At Buttevant it "probably originated in men off furlough from London," and at Portland a similar origin was attributed to it. At Armagh it was "probably contracted at Holywood," the rifle range near Belfast.

At Sandhurst College, where the disease had existed since January 9th among the resident staff, the gentlemen cadets rejoined the College on February 11th, and cases of Influenza began to occur among them the following day, and continued to occur until March 13th; 29 out of 360 being attacked.

Two instances occurred, viz., at Dover and Portsmouth, of stations situated near together being attacked at intervals of two or three weeks.

INFLUENZA AMONG THE ARMY SERVING ABROAD.

In army abroad.

The following table is compiled from the monthly returns received in the Army Medical Department. It includes officers and men only; not women and children.

INFLUENZA CASES sent to HOSPITAL in following MONTHS.

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In army abroad.

Station.	Strength.	Cases of Influenza in											Percentage attacked.			
		1889	1890.													
		December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.		Total.		
Gibraltar - -	4,552	—	650	100	—	—	—	—	—	—	—	—	—	—	750	16.5
Malta - -	6,967	—	176	6	1	—	—	—	—	—	—	—	—	—	183	2.6
Cyprus - -	489	1	17	12	1	—	—	—	—	—	—	—	—	—	31	6.3
Egypt - -	3,148	—	—	39	8	—	—	—	—	—	—	—	—	—	47	1.5
Bermuda - -	1,304	—	11	19	10	1	—	—	—	—	—	—	—	—	41	3.1
Canada - -	1,347	—	16	3	5	3	3	—	—	—	—	—	—	—	30	2.2
Madras - -	9,068	—	—	—	40	352	83	2	—	—	—	—	—	—	477	5.2
Lower Burmah -	2,478	—	—	—	—	3	65	19	—	—	—	—	—	—	87	3.5
Mandalay - -	2,773	—	—	—	—	—	98	43	13	1	—	—	—	—	155	5.6
Bengal (white troops).	41,530	—	—	3	328	845	122	1	—	—	—	—	—	—	1,299	3.1
Bombay - -	12,896	—	—	—	102	140	5	—	—	—	—	—	—	—	247	2.0
Hong Kong - -	1,339	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Straits - -	1,143	—	—	—	1	—	—	—	—	—	—	—	—	—	1	0
Jamaica (black)	652	1	—	—	—	—	—	—	—	—	—	—	—	—	1	1
„ (whites)	464	—	—	—	—	—	—	—	—	22	1	—	—	—	23	5.0
Barbados, &c. (whites).	577	—	—	—	—	—	17	14	7	1	—	—	—	—	39	6.8
„ (blacks)	306	—	—	—	—	—	2	1	—	—	—	—	—	—	3	1.0
Mauritius - -	519	—	—	—	—	—	—	—	—	—	2	1	—	—	3	0.6
West Africa (whites)	33	—	—	—	—	2	—	—	—	—	—	—	—	—	2	} 1.7
„ „ (blacks)	563	—	—	—	—	5	3	—	—	—	—	—	—	—	8	
St. Helena - -	133	—	—	—	—	—	—	—	—	3	—	—	—	—	3	2.2
South Africa -	2,767	—	—	3	—	1	7	1	—	—	—	—	—	—	12	0.5
Ceylon - -	1,146	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0
													(Dec. 1890.)			
Total - -	96,194	2	870	185	496	1,352	405	81	20	27	3	1	—	—	3,443	3.5

ROYAL NAVY.

The following tables are furnished through the courtesy of the Director-General of the Medical Department of the Navy. They show the number of cases of epidemic Influenza that occurred on board sea-going ships of the Royal Navy during the first and second quarters of the year 1890. In Royal Navy.

The proportion attacked with Influenza among the crews of ships on which it occurred was 23.2 per cent. It was very high on ships stationed at Simons Bay. The number of days sickness on board was 4.5 days per case, or (deducting from the total number of cases those sent to hospital), 5 days per case.

I.

RETURN of the CASES of EPIDEMIC INFLUENZA that occurred on Board SEAGOING SHIPS of the ROYAL NAVY in LADY QUARTER, 1890.

On Epidemic
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In first quarter
of 1890.

Name of Ship.	Station.	Average Daily Force.	No. of Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"ACORN" -	Pacific -	109	22	—	126	Ship at Vancouver when contracted 16 cases occurred there and the remainder after leaving on 6th January for Esquimalt. Disease lasted 18 days.
"AGAMEMNON."	Mediterranean	362	70	2	277	Cases occurred between 1st and 22nd January. Ship at Malta. Disease ended abruptly. (Also three cases at end of December.)
"ALECTO."	West Coast of Africa.	80	18	—	48	Nearly all cases occurred in March. Ship cruising on the coast. Disease had been prevalent on shore for two months.
"AMPHION" -	Pacific -	256	69	2	284	All cases occurred in January, while ship was at Esquimalt. The last was entered on 29th. The disease was prevalent on shore.
"ANSON" -	Channel Squadron.	544	114	—	275	Commenced at sea on 16th January, two days after leaving Gibraltar. The disease prevailed extensively on shore at that place. Ended on 14th February.
"ARCHER" -	West Coast of Africa.	184	106	1	526	First case occurred at Bathurst (disease being prevalent to N. of that place) on 17th February. Last case on 10th March, while on passage to Ascension. Largest number on one day 23 (23rd February).
"ASSISTANCE" (Troop ship.)	Home -	126	11	2	42	Moving about from one English port to another.
"AUSTRALIA"	On way to Mediterranean.	462	159	—	690	Outbreak occurred while ship was at St. Vincent, Cape de Verde, between 7th and 25th January. Cased after leaving.
"BELLEROPHON."	West Indies -	665	7	2	8	Ship at Bermuda. Disease commenced on 27th March with one case, the other six on 31st, and continued in next quarter. Disease existed on shore for some weeks previous, and a Swedish vessel lying close to this ship had it very severely.
"BENBOW" -	Mediterranean	513	16	2	89	Occurred in January, while the ship was at Gibraltar.
"BRAMBLE"	South-east coast of America.	75	32	—	232	First case on 8th February at Monte Video. Ship was there from 31st January to 9th February and disease was very prevalent on shore.
"CARYSFORT"	Mediterranean	282	31	—	102	Occurred in January while ship was at Malta. Disease prevalent on shore. Ship left on 23rd January.

Name of Ship.	Station.	Average Daily Force.	No. of Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"CHAMPION"	Pacific - -	243	41	1	211	Ship at Honolulu 4th January to 20th February. Disease prevalent on shore. First case on 14th January. Cases decreased after leaving.
"CLEOPATRA"	South-east coast of America.	278	148	—	576	Occurred during latter part of January and first week in February, while the ship was lying near Monte Video. The disease was very prevalent on shore.
"COCKATRICE."	Mediterranean	59	3	—	21	Ship stationed at Kustenje. 24 cases occurred at end of December, and the 3 were in the first week of the year.
"COCKCHAFER."	On passage home from China.	64	1	—	4	Occurred on passage, but ship had called at Penang, Colombo, Aden, &c.
"COLLINGWOOD."	Mediterranean	478	141	—	660	Ship at Port Augusta, Sicily, 1st to 18th January. Disease prevalent on shore, and broke out on board while there, after a week of almost constant rain.
"COLOSSUS" -	Do.	448	59	19	399	Occurred in January and February. Ship was at Gibraltar till 14th February, and then proceeded to Malta.
"CONQUEST" -	East Indies -	296	2	—	10	Ship at Zanzibar and in the neighbourhood.
"CRUISER" -	Mediterranean	138	20	—	69	Ship at Malta. 17 cases occurred between 1st and 11th January, and 3 after that date. Two cases in addition occurred on 31st December 1889.
"CURLREW" -	Channel Squadron.	110	23	—	53	Ship at Gibraltar 1st January to 6th February. First case occurred on 2nd January, and the disease had been noticed on shore previously. Ship arrived on 29th December 1889 from Aroa Bay.
"DAPHNE" -	Pacific . -	140	56	—	548	Commenced in last week of February. Ship at Acapulco. So far as known the disease did not exist at that place, but was prevalent in Mexico.
"DOLPHIN" -	Mediterranean	121	24	—	85	Occurred while the ship was at Malta. Commenced in January and ended on 10th March.
"DREADNOUGHT."	Do.	442	87	—	320	While the ship was at Malta. The first cases (5) occurred in December 1889, and are in addition to the 87. Ship left on 26th February.
"EDINBURGH"	Mediterranean	434	124	11	461	There were also six cases at end of December. Ship at Malta all the time. Left on 21st March.
"EMERALD" -	West Indies -	257	32	—	82	First case occurred while on passage to Bermuda at end of March. Ship had been just previously at Jamaica and Nassau.
"FORWARD" -	Do. -	62	12	—	70	Ship in dock at Bermuda.
"GANNET" -	Mediterranean	130	25	11	49	All cases occurred in January while at Malta. Ship left on 21st January.

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Name of Ship.	Station.	Average Daily Force.	No. of Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"GARNET" -	East Indies -	236	39	—	84	Disease commenced sudden-ly on 16th March. Ship left Zanzibar three days previous.
"GOSHAWK" -	Mediterranean	60	37	—	132	Occurred while the ship was at Gibraltar. There was also one case at end of December. Disease prevalent on shore, and reported to have been brought there by an American man-of-war. Ship left on 4th February.
"HECLA" -	Do.	268	54	—	326	Disease occurred while the ship was at Fiume between 5th January and 13th February. Prevalent on shore there.
"HIMALAYA" (Ship's company).	On passage to Hong Kong.	288	74	—	502	Ship left Portsmouth on 27th December 1889 and called at Plymouth on 28th. First case occurred on 1st January when ship was nearing Gibraltar.
"HIMALAYA" (Super-numeraries).	Do.	754	145	—	1,208	
"IRON DUKE"	Channel Squadron.	549	38	—	205	First case occurred on 11th January while at Gibraltar, and the last on 27th February. Ship remained there greater part of the time.
"LANDRAIL" -	Mediterranean	103	32	—	132	First case on 1st January and last on 12th. Ship was at Alexandria at commencement, and remained until 8th and then stayed at Port Said until 16th.
"LINNET" -	China - -	84	15	—	65	Cases occurred between 13th and 20th March. Ship left Hong Kong on 8th, arrived at Amoy 11th, and left 14th for Shanghai. Weather cold and wet.
"MALABAR" - (Troopship).	On passage home from India.	237	80	4	266	First 19 cases occurred on 20th January at Cadiz, day after arrival, and last on 27th, date of arrival at Portsmouth.
"MARINER" -	East Indies -	136	29	—	163	Ship was in dock at Bombay and disease existed on shore early in January. Crew were turned over to Sailors Home on 22nd January. Although cases of catarrh had occurred, the disease did not appear until 2nd March. Ship left on 28th March and no further cases occurred.
"MELITA" -	Mediterranean	119	46	—	217	Commenced on 31st December 1889 at Malta, five days after ship's arrival from Port Said. Disease prevalent at Malta, but not at Port Said. Ceased on 3rd February.
"MONARCH" -	Channel Squadron.	634	201	—	991	Commenced at Gibraltar 12th January, 10 days after ship's arrival, and continued to 12th February. A few isolated cases occurred also up to 7th March.
"NORTH-UMBERLAND."	Channel Squadron.	798	309	—	2,282	Commenced at Gibraltar on 11th January, nine days after the ship arrived, and ended 7th February. Was prevalent amongst troops and civilians on shore.

Name of Ship.	Station.	Average Daily Force.	No. of Cases.		Days' Sickness on Board.	Remarks.
			Total.	Sent to Hospital.		
"ORION" -	China - -	269	85	—	400	Ship at Singapore at commencement. Disease not prevalent on shore, but a few cases existed. First case on board on 27th January, and began to decline on 25th February. Ship left on 29th January for passage to Malta.
"ORLANDO" -	Australia -	553	125	—	425	Commenced while ship was at Melbourne on 21st March, six days after arrival. Disease had appeared suddenly on shore. Weather had changed to cold and rain.
"ORONTES" - (Troopship.)	On passage to Hong Kong.	236	46	—	281	Disease, so far as known, was taken on board at Malta.
"PHAETON" -	Mediterranean	264	37	18	87	At the time the cases occurred the crew were living on board a hulk at Malta.
"PIGMY" -	China - -	87	7	—	39	The cases occurred in the last half of March. The ship was at Singapore, and the disease prevailed slightly on shore.
"POLYPHEMUS."	Mediterranean	139	34	—	290	Ship at Fiume up to 11th February, having arrived on 1st January from Corfu (two days on passage) where the disease was prevalent. The two first cases occurred at end of December 1889.
"RAPID" -	Australia -	179	34	—	111	Ship arrived at Hobart Town on 10th February. First case occurred on 18th March. Disease existed on shore, and was spreading when the ship left on 27th March.
"RUBY" -	Training Squadron (West Indies).	262	65	—	215	Most of the cases were between 9th and 31st March. Ship was at Barbados 1st to 8th March, and then visited St. Kitts (12th), St. Thomas (20th), and Bermuda (28th). The Medical Officer had no knowledge of any epidemic at Barbados, but a few cases existed at St. Kitts.
"SATELLITE"	On passage home from East Indies.	185	2	—	5	Ship six days at Malta, and left on 27th March. First cases occurred two days after leaving.
"SCOUT" -	Mediterranean	184	13	12	9	Ship at Malta until 18th March. One case occurred at end of December, and the 13 at beginning of January.
"SERAPIS" - (Troopship.)	On passage to Bombay.	279	41	—	106	The first case was an officer who visited some friends at Malta (who had been suffering from the disease) on 26th December 1889, he being attacked on 31st. The next case was on 1st January when near Suez. Ship left Portsmouth on 18th December.
"SURPRISE" -	Mediterranean	103	35	13	113	Ship at Malta to 3rd March. Most of the cases occurred at the beginning of the quarter.

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Name of Ship.	Station.	Average Daily Force.	No. of Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"SWIFT" -	China -	94	19	—	57	At sea part of time, calling at Chirikiang, Shanghai, Haiton Island, and arrived at Hong Kong on 27th March.
"SWIFTSURE"	Pacific -	492	15	—	72	Ship stationed at Esquimalt till 28th January. There had for some time been an epidemic in British Columbia. First case on board occurred on 5th January, and the disease lasted until 26th. Weather cold and inclement.
"TEMERAIRE"	Mediterranean	594	79	—	424	Ship at Malta on 25th December 1889 to 5th February 1890. The first cases (9) occurred at end of December. Ship returned to Malta on 8th February, and remained maimed until 24th March. Health of crew improved after that date.

II.

In second
quarter of 1890.

RETURN of the cases of EPIDEMIC INFLUENZA that occurred on board
SEA-GOING SHIPS of the ROYAL NAVY in MIDSUMMER QUARTER,
1890.

Name of Ship.	Station.	Average Daily Force.	Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"ALECTO" -	Cape of Good Hope.	80	2	—	9	Occurred in June. Ship at Lagos.
"BEAGLE" -	North America and West Indies.	122	61	—	332	First case on 2nd June, two days after leaving Rosario (W. I.), where the ship had been four days. Last case on 20th June.
"BELLEROPHON."	Ditto -	650	153	36	584	Commenced at Bermuda in March (see previous return), where the ship remained during the outbreak. Last case on 30th April.
"BRAMBLE" -	S.E. coast of America.	75	1	—	3	End of the outbreak which commenced in previous quarter.
"BRISK" -	East Indies - Remaining from quarter.	170	3 46	—	12	There were also 46 cases in previous quarter returned as dengue. Ship at Zanzibar, and in the neighbourhood.
"CANADA" -	N. America and West Indies.	285	57	11	271	First case on 11th April and last on 24th May. Ship at Bermuda from commencement of the quarter.
"COMUS" -	Ditto -	280	88	17	292	Occurred between 10th April and 3rd May. Ship at Bermuda from 12th March.

Name of Ship.	Station.	Average Daily Force.	Cases.		Days' Sickness on Board.	Remarks.
			Total.	Sent to Hospital.		
" CONQUEST "	East Indies -	305	14	-	46	Continuation of outbreak in previous quarter. Ship in neighbourhood of Zanzibar.
" CURAÇOA "	Cape of Good Hope.	290	167	79	464	Ship at Simon's Bay. Commenced in April and continued till middle of May.
" DAPHNE "	Pacific -	140	8	1	218	Continuation of epidemic in last quarter. Ship at Panama.
" DART "	Australia -	56	8	-	28	Cases occurred at Hobart, where ship arrived on 28th April. Weather very cold.
" GARNET "	East Indies -	235	11	-	36	Continuation of cases in previous quarter. Ended on 9th April. Ship at Colombo.
" IMPERIEUSE "	China -	585	35	-	138	Ship had been at Hong Kong over three months when disease commenced on 15th April (date of leaving) and continued to 21st May, when off coast of Japan.
" KINGFISHER "	East Indies -	160	38	-	121	Ship at Zanzibar from 15th March. Cases occurred between 1st and 24th April, heavy rains being prevalent. Ship cruising in the neighbourhood all the quarter.
" LIZARD "	Australia -	75	7	-	15	Occurred in April. Ship at Sydney from 19th February.
" NYMPHE "	Pacific -	135	61	-	307	Weather fine and bright. Ship at Callao, 10th to 28th April, where disease was prevalent. First case on day after leaving, and disease lasted for three weeks.
" OPAL "	Australia -	225	44	-	120	Ship arrived at Sydney on 27th March. All cases occurred in April while there.
" ORLANDO "	Australia -	540	31	-	161	Ship at Sydney. Continuation of outbreak in last quarter. Last case on 10th April.
" PARTRIDGE "	N. America and West Indies.	80	17	-	113	Ship at Bermuda from 21st March. First case on 2nd of April.
" PHEASANT "	Cape of Good Hope, &c.	90	36	3	174	Ship at Simon's Bay since February. Disease existed on shore. Cases occurred in April.
" PIGEON "	East Indies -	85	10	-	71	Ship left Seychelles on 27th March, and arrived at Bombay 5th April, and remained until 2nd May. First case occurred on 1st April.
" PIGMY "	China -	80	2	-	18	Continuation of outbreak in previous quarter.
" POLYPHEMUS. "	Mediterranean	133	1	1	2	Case occurred at beginning of April. Ship at Malta.
" PORPOISE "	China -	166	1	-	4	Occurred soon after arrival at Singapore on 24th April.
" RALEIGH "	Cape of Good Hope, &c.	556	249	131	520	Commenced 17th April at Simon's Bay on week after arrival from Ascension. Disease prevalent at the former place.
" RAMBLER "	Australia	10	29	-	195	Ship at Sydney when disease was contracted.

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Name of Ship.	Station.	Average Daily Force.	Cases.		Days' Sick- ness on Board.	Remarks.
			Total.	Sent to Hos- pital.		
"RAPID" -	Australia - Remaining from last return.	178	25 28	—	179	Ship at Sydney. Outbreak commenced in previous quarter and ended on 17th April.
"RAVEN" -	Australia -	60	17	—	73	Ship at Sydney. First case on 19th April and last on 27th April.
"REINDEER" -	East Indies -	120	25	—	94	Ship cruising in neighbour- hood of Zanzibar.
"ROYALIST" -	Australia -	174	68	—	312	Ship arrived at Sydney on 1st April. Cases occurred between 10th and 25th April.
"RUBY" -	Training Squadron. Remaining from last quarter	227	22 12	—	149	Cases occurred between 1st and 20th April. Ship at sea on passage home from Bermuda (see previous return).
"SATELLITE"	On passage home. Remaining from last quarter.	154	1 2	—	7	Left Malta on 27th March (see last return).
"STORK" -	Cape of Good Hope, &c.	64	15	6	73	Ship arrived at Simon's Bay 5th March and remained until 23rd June. First case occurred in end of March, and disease contin- ued until end of May. Disease existed on shore.
"SWALLOW" -	Do.	147	11	9	22	Ship in dock at Simon's Bay. First case on 17th April, and disease continued until middle of May.
"SWINGER" -	Australia -	66	21	—	110	Ship at Sydney since 10th February. First case on 10th April and last on 18th.
"TOURMA- LINE."	N. America and West Indies.	246	98	—	369	Ship cruising amongst W. I. Islands, principal stay at Barbados.

INFLUENZA in the MERCANTILE MARINE.

In ocean-going
passenger steam-
ships.

In reply to letters addressed by me to the principal lines of ocean-going passenger steamships from this country, inquiring as to whether Influenza had broken out on any of the vessels of their lines at sea more than four days after leaving any port, the following information has been courteously furnished me.

Castle Line.—Messrs. Donald Currie & Co. send reports from the medical Officers of five of their South African Royal mail steamers, and add that on several of their steamers no cases of Influenza occurred, and none of the other letters received from their surgeons contained any details of importance.

Dr. R. W. Inkster, surgeon to the "Drummond Castle," reports an outbreak of Influenza on that vessel on the voyage beginning December 18th, 1889. The first case came under his notice the day after leaving Dartmouth, and within 12 days about 30 men were laid up, mostly stewards and sailors, there being only five passengers affected. All those affected had to be got off duty for two or three days, at the end of which time they returned to work in an enfeebled condition. One case was complicated with pneumonia, one with congestion of the lungs, and a large per-centage had bronchial catarrh and cough, which continued to be troublesome in many instances to the end of the voyage.

Dr. J. A. Whitty, surgeon to the "Roslin Castle," states that that vessel sailed from London on or about January 16th, 1890, on which day he himself began to be ill with what was unmistakably Influenza, and it was not until leaving Lisbon, six days later, that he began to get convalescent. During this period the different members of the crew were falling ill at the rate of about eight per day, some of them having the disease in a mild and others in a severe form. Altogether he thinks that quite half the ship's company had the complaint, and it appeared to be more prevalent amongst the firemen and sailors than amongst the stewards, while only one of the passengers had the disease. This, Dr. Whitty thinks, may be accounted for by the fact that most of the latter had it on land prior to starting, while the ship's company was chiefly composed of men who had come home from the Cape in the "Roslin Castle" on the previous trip, and others who had come in some of the vessels arriving later. Up to Madeira the sick list increased daily, but after leaving that port there were few, if any more, cases. Nearly every case was followed by acute bronchitis and one by acute pneumonia.

Dr. F. G. Cory, surgeon to the "Norham Castle," writes that a number of cases of Influenza occurred on board that vessel during January and February 1890: "We left London with a number of cases, mostly among the stewards and the crew, but this was not to be wondered at considering the damp, cold, misty weather which then prevailed, and also the continual 'sweating' of the iron roof and sides of the fore-castle as long as we remained in the cooler latitudes, which of course resulted in constant dripping down and keeping the place damp. The Influenza on board, after attacking the before-mentioned together with the firemen, then got a slight hold upon the steerage passengers, and from them it went to the second class, and about a week before we arrived at Cape Town a number of the first-class passengers were victims to it. This shows, therefore, that many cases took place after the lapse of four days from leaving any port (*i.e.* Madeira). Several cases occurred along the coast, and in a lady passenger, who embarked at Durban, the disease manifested itself by the time we returned to Port Elizabeth, some two days after. I had about 60-70 patients suffering from Influenza on board, resulting in many cases in chest affections, but there were no deaths on board. These cases were unmistakably of the same character as the disease then prevailing in all parts of Europe. I had no cases at all after we left Cape Town for London."

Dr. A. J. McNally, surgeon to the "Grantully Castle," says: "The first cases which came under my notice on the 'Grantully Castle' were in February last. We left London on the 26th February with several cases on board; two that I might call acute cases, and about 10 convalescents. I myself was amongst the latter, as within two days of my arrival in London in the beginning of February I got a very severe attack. At Dartmouth we got several convalescents on board, but no acute cases. These were divided among first, second, and third-class passengers. I have no record of any case amongst sailors, stewards, and firemen when leaving. On Sunday, March 9th, three or four days past Madeira, two fresh cases occurred, one a girl aged 12 years, in the second-class, and one steward. Neither of these developed any serious symptoms. Having had so many cases in various stages from the beginning of the voyage, it was of course impossible to say how long the incubation stage might be in those two cases. One other case appeared on the 14th March in a third-

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“ class passenger who was already suffering from phthisis. I was
“ agreeably surprised to find that the disease spread so very little on
“ board: the three fresh cases mentioned being a remarkably small
“ number among so many people. From the time that we ran into warm
“ weather there was an improvement, and practically speaking a cure
“ amongst all who had been affected.

“ On the following voyage, leaving 21st May, we had several conva-
lescents, but no acute cases.

“ On our homeward voyage, leaving Cape Town 2nd July, we had four
convalescents who had contracted the disease in South Africa. One of
them got a very bad relapse as we were nearing Cape Verde. At the
same time two passengers got relapses of ‘Delagoa Bay fever,’ an
occurrence which almost invariably happens about that part of the
voyage, and which is attributed to the vicinity of the noted malarious
Sierra Leone coast. The fact of this Influenza case getting a relapse
under these circumstances is interesting in connexion with the widely
accepted theory of the malarial origin of the Influenza epidemic.”

Dr. C. P. Thomas, surgeon to the “Hawarden Castle,” writes that
as far as his memory goes the few cases which occurred were solely
among the crew, and were of a mild type; they occurred between
leaving London and Dartmouth, and no case developed after four days
from the date of leaving England.

The *Peninsular and Oriental Steam Navigation Company* send a
communication from Dr. Anderson Smith respecting an outbreak of
Influenza on the S.S. “Oriental,” adding that these are the only cases
which they have recorded pertinent to the inquiry on hand.

Dr. Anderson Smith states the “Oriental” left London on
March 14th, 1890, neither passengers nor crew showing any symptoms
of Influenza. The outbreak commenced on the morning of March 19th,
when many of the crew had to be put on the sick list. After this each
day brought in fresh cases until on reaching Port Said on March 27th,
13 days from London, at least a third of the crew had suffered from the
epidemic. From this point matters began to mend, each day showing
an improvement in the sick list, and on arrival at Bombay the ship was
practically clear. Almost all of the cases occurred amongst those of the
crew in the forepart of the ship, passengers and most of the deck hands
escaping.

In answer to inquiries he further states that the “Oriental” arrived at
Gibraltar on March 18th, having had no communication with other
ships or the land since leaving London on March 14th. At Gibraltar
they stayed the usual few hours. On the morning of March 19th at
sea, only a few hours steam from Gibraltar, 18 men came to see him,
seven of them ill enough to be put on the sick list. He failed to find any
cause for the localisation of the disease among the men in the fore part
of the ship.

The *Royal Mail Steam Packet Company*, whose steamers ply to the
West Indies, Brazil, and the River Plate, reply that Influenza has oc-
curred since January 1890 on only four of their ships, and send me the
surgeons’ journals, from which the following facts appear:—

1. The S.S. “Medway” left Southampton on February 6th with 542
on board.

A carpenter	was taken ill of Influenza	February 9th, at sea.
A quartermaster	“ “	February 12th, “
A boatswain	“ “	February 14th, “
Another hand with catarrh	- “ -	February 15th, “

Total 3 (or 4) cases.

2. The S.S. "Atrato" left Southampton January 2.

Mr. and Mrs. R., saloon passengers, had Influenza January 3rd.

Other cases occurred among the crew on January 5th, 1; 11th, 1; and 12th, 3 cases. Total 5 cases. There were also some cases of febricula and bronchial catarrh about the same time.

3. The S.S. "Don" left Southampton January 30th and Lisbon February 3rd.

Mr. A., third-class passenger, had Influenza before starting.

A seaman was taken ill February 5th, at sea.

A labourer ,, ,, February 24th, at River Plate.

The third officer was taken ill March 18th, at sea.

The fourth officer ,, ,, March 25th, ,,

4. The S.S. "Magdalena" left Southampton February 27th and Lisbon March 3rd.

A steward was taken ill with Influenza March 4th, at sea.

The *Union Steamship Company*, plying to South Africa, state that the only recorded cases of Influenza on their vessels more than four days after departure from last port of call since October 1st, 1889, have occurred on board the S.S. "Dane," between the Cape and Teneriffe. The "Dane" left the Cape on January 19th, 1890. 3 cases of Influenza (third officer and 2 seaman) occurred on January 27th, 3 on January 28th, 3 on January 29th, 1 on January 30th, 1 on February 1st, and 1 on February 3rd. The case on February 1st was a third-class passenger; all the others occurred among the officers and crew.

The *Cunard Steamship Company* state that the only cases of Influenza which they can trace on their steamers occurred on the "Servia" and the "Umbria."

The S.S. "Servia" left Liverpool on January 11th, 1890, and Queenstown the following day for New York. On January 15th the second engineer was off duty suffering from Influenza, and on January 16th another hand. The S.S. "Umbria" sailed from Liverpool February 1st, and from Queenstown the following day, for New York. On February 4th a seaman was sent to hospital with Influenza, and another on February 5th.

The *Inman Steamship Company* state that, having examined their surgeons' reports for 10 months up to June 1890, they cannot find that epidemic Influenza has occurred on any of their steamers, though there have been two or three isolated cases of "influenza" of apparently a mild description.

Messrs. Ismay, Imrie, & Co., of the Orient Steam Navigation Co., state that no case of Influenza has occurred on board any of their vessels when more than four days out from port.

The following firms state that no cases of Influenza have occurred on any of their vessels after leaving port, viz., Messrs. Wilson and Sons, Guion & Co., Singlehurst & Co., and the West Indian and Pacific Steamship Co., Elder, Dempster, & Co., and Lamport and Holt.

Messrs. Booth & Co., the Dominion Line, the Pacific Steam Navigation Company, and the Norddeutscher Lloyd Steamship Company were unable to give me information, having no records; but the latter company stated that very few cases of Influenza, and those mild, occurred on their steamships.

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In H.M.'s Cus-
toms, by Dr.
Dickson.

EPIDEMIC INFLUENZA in the OFFICERS of HER MAJESTY'S CUSTOMS,
LONDON, in the WINTER of 1889-90.

The following interesting reports on epidemic Influenza among the officers of Her Majesty's Customs at London and Gravesend are contributed by Dr. Dickson, R.N., Medical Officer, Her Majesty's Customs.

Custom House,
March 19th, 1890.

"Till the 16th of December 1889 the proportion of sickness among these officers was not materially different from that occurring in the corresponding period of other years. The cold weather of October and December was accompanied by the ordinary prevalence of catarrh and sore throat, and a few cases of pulmonary inflammation, and in the unusually mild weather of November some cases of gout in men hereditarily predisposed thereto, and of diarrhœa, seemed due to climatic influence of abnormal character. But in the middle of December the presence of the epidemic, whose progress had been watched from eastern Europe across the Continent, was distinctly manifested, though the cases at first were few in number and apt to be mingled with the many of catarrh, &c. incident to a continuance of severe weather, and a remarkable sequence of low night temperature which were observed at this period.

The cases of Influenza occurred in the following order of dates and number, the figures indicating the days absent which in some measure serve to denote the severity of each case in regard to concomitant debility or subsequent complications, chiefly forms of pulmonary inflammation :—

Date.	Number of Cases.	Duration of Cases (Days absent from Duty).
1889.		
December 16th -	1	14.
" 17th -	1	20.
" 20th -	1	20.
" 23rd -	1	20.
" 28th -	1	10.
1890.		
January 1st -	3	13, 32, 11.
" 4th -	2	18, 18.
" 6th -	9	15, 34, 14, 7, 10, 14, 15, 67, 8.
" 8th -	10	17, 16, 6, 13, 13, 15, 16, 18, 12, 17.
" 10th -	10	17, 11, 21, 19, 21, 8, 10, 12, 15, 14.
" 13th -	4	9, 9, 7, 7.
" 16th -	1	24.
" 21st -	5	20, 13, 14, 16, 8.
" 24th -	1	10.
" 28th -	2	14, 14.
" 31st -	1	13.
February 5th -	1	5.
" 7th -	2	6, 6.
" 10th -	1	14.
" 14th -	1	5.
" 21st -	1	10.
" 24th -	5	7, 12, 14, 13, 16.
" 27th -	1	12.
	65	

Whence it appears that the disorder attained its maximum of intensity on the 6th, 8th, and 10th of January, and that on the 21st of January and 24th of February there was likewise a temporary increase in the number attacked.

The ordinary duration of the illness was from one to two weeks.

As these cases of Influenza were under my immediate supervision, I believe I have been able to discriminate them from cases of customary winter disorders, catarrh and sorethroat, of which 16 were recorded in the period, and of pulmonary inflammation, not preceded by Influenza symptoms, which were five in number. The most prominent and uniform symptoms of the epidemic were frontal pain, chiefly near the orbits and eyeballs, less often in the vertex or occiput, dorsal and lumbar pain extending to the extremities, sense of having been beaten with sticks, rigors in many cases, sharp pyrexia in nearly all, lasting from one to three days, with much debility and more persistent than might be expected from the amount of fever. The attack was often quite sudden and alarming for the time. In several cases, in addition to some of these symptoms, cough, coryza, and lachrymation and sorethroat were to be found, and in a few bronchitis was developed, and these were the more serious and protracted. In two cases of men verging on 60, the bronchitic pneumonia was very severe, in one terminating fatally, while the other is slowly improving to convalescence.

Only five cases occurred in men over 50 years, and only two in those under 20. The remainder were healthy active men from 25 to 45 who have made good recoveries, only two or three being still under treatment. Immediate confinement to bed, diaphoretics and anodynes at the outset, followed by quinine and strychnia were the chief remedies employed, with appropriate treatment for complications as they arose. Gastric or intestinal troubles were comparatively rare. In some houses two or more members of a family were affected, but no very obvious instance of its being directly communicated occurred in my experience, as from husbands to wives, &c., although such cases may possibly have happened subsequently to my attendance.

The officers under my immediate supervision are about 600 in number, of different ages and nationalities, with very varied duties on the river, river-side, docks, &c. They are fairly paid (1*l.* 10*s.* to 3*l.* a week) and well nourished; reside chiefly in the eastern, northern, and southern suburbs, although most of their time is spent in their occupation near or on the river, which often involves much labour and exposure to weather. Yet as a rule they enjoy good health, and the rate of sickness (3 per cent.), mortality (1·2 per cent.), and superannuation (0·7 per cent.) for illness is comparatively small. The 65 cases of Influenza differentiated above were entered betwixt the 16th of December and the 1st of March, apparently the limits of the epidemic in this force. In the same period were admitted 21 cases of respiratory disease, 42 of other diseases, and 17 of accidental injuries. Consequently Influenza caused 50 per cent. of the total amount of sickness, and affected 11 per cent. of the individuals of the force during the brief period of its prevalence.

“Of the officers of the London division whose cases have been related, a third are men who in no way, in the ordinary course of their duty, come in contact with infection imported from abroad; persons employed as clerks in the Custom House, and at the various stations and docks, and as messengers; the remainder are located on wharves, quays, &c., attending to the receipt and discharge of cargoes of ships, rummaging vessels for contraband, examining passengers and goods on landing from

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ships, and also at the railway stations communicating with the Continent, and at the Parcel Post depôts, and all these officers are much in contact with persons and packages from "Foreign." But no one class of employés more than another seemed to be liable or exempt from the disease by reason of the special nature of their work.

The Gravesend division of the Port of London comprises 110 officers, who nominally reside at Gravesend, but spend three fourths of their existence on board ships in the protection of the revenue, and are therefore constantly in contact with persons and goods from "Foreign," being placed on board immediately on arrival. Of these officers, from the first week of December 1889 to the third week of February 1890, 31 were affected with catarrh of various degrees of severity, including some, no doubt, of Influenza, although only seven were so designated in the weekly reports. This gives a ratio of only 6.4 per cent. of cases diagnosed as Influenza in the officers of the Gravesend division; none were very severe, a few were attended with bronchitis, but most recovered in from 3 to 10 days, and by the end of February none remained on the sick list."

P.S. by Dr. Dickson, January 20th, 1891.—"The death from Influenza above mentioned was the only death that occurred in the year 1890 in the force of 700 men, a marvellous exemption from mortality, and the more remarkable in that many of them are well advanced in life, and most of them are much exposed in the course of their duties to the weather. Even in the last two months of Arctic severity the number disabled by sickness has been inconsiderable, and without any fatal result; while the superannuations, only six in number in 1890, have been of men between 50 and 60 from chronic forms of disease incident to their age."

INFLUENZA IN H.M.'S PRISONS.

In prisons,
extracts from
Dr. Gover's
annual report.

The following extract from the annual report for the year ending March 1890 of Dr. R. M. Gover, medical inspector to the Prisons Commissioners refers to the Influenza epidemic.

"As the result of the epidemic Influenza from which inmates of the prisons suffered during the first three months of the year (1890) in common with the rest of the population the deaths from pneumonia were much more numerous than usual. It is remarkable that notwithstanding this unfavourable influence, the rate of mortality should have been less than that of any year on record. This low mortality must be ascribed chiefly to the reduction in the number of deaths from phthisis, heart diseases, and disease of the nervous system."

The following extracts from the inspectors' reports on local prisons also refer to the Influenza epidemic.

(The numbers in brackets show the daily average number of total prisoners at each prison during the year.)

Birmingham (443).—"The epidemic of Influenza occurred in the prison during January."

(See report on p. 230.)

Bodmin (42).—"There has been no epidemic among the prisoners, but most of the officers have suffered from Influenza."

Canterbury (48).—"The medical officer reported that there had been 9 cases of Influenza, and that 10 officers were affected with the same epidemic about the same time. The death of a prisoner had occurred from an attack of acute inflammation of both lungs accompanying an attack of Influenza caught before admission to the prison."

Chelmsford (256).—“Some 50 prisoners suffered from a mild form of Influenza, but in one case only was there any serious result.”

Devizes (59).—“Six (prisoners) suffered from well-marked symptoms of Influenza.”

Exeter (143).—“The malarious complaint denominated Influenza, rife in the neighbourhood of the prison, as everywhere else, invaded the houses of the non-resident officers, and very late made its appearance within the walls of the prison. The cases, however, were not numerous; speedily yielded to treatment and were uncomplicated.”

Ipswich (110).—“There has been no epidemic.”

Kendal (21).—“No case of Influenza occurred in the prison, notwithstanding its general prevalence in the town of Kendal.”

Leicester (140).—“With the exception of a few cases of Influenza there has been no epidemic.”

Liverpool (838).—“The average daily hospital sick have materially increased during the past four months, since November, principally, if not entirely, due to Influenza, and in no way attributable to the sanitary state of the prison, which is excellent.”

Maidstone (190).—“There was a slight outbreak of Influenza in January, which did not spread beyond 12 prisoners and 5 officers. During this time the prisoners were kept in their cells, and not allowed to go to chapel.”

Norwich (129).—“The officers (with two exceptions) have all suffered from the prevailing epidemic of Influenza, but there was no epidemic in the prison.”

Portsmouth (118).—“There has not been a single case of Influenza; although this complaint has been very prevalent in the town.”

Preston (448).—“The prison did not escape the Influenza epidemic, but the Medical Officer was glad to be able to state that no fatal results had followed the illness, although there were many officers and prisoners afflicted with it.”

Reading (152).—“The Medical Officer reports that during the past year there was an epidemic of Influenza, but no very serious cases, about 25 in all.”

Ruthin (38).—“The Medical Officer reported that although Influenza had been very prevalent in the locality, only one prisoner took this disease.”

St. Albans (71).—“The Medical Officer reports the health of the prisoners good, except during the last quarter of the year, when the Influenza epidemic attacked several prisoners.”

Strangeways (1,084).—“The Medical Officer reported that during the early part of 1890 a somewhat severe outbreak of Russian Influenza occurred in the prison, especially on the female side; nearly 100 prisoners and officers were attacked, but fortunately no case proved fatal.” [See p. 280.]

Wandsworth (1,002).—“In the month of January the Influenza epidemic, which was so prevalent throughout London, attacked officers and prisoners to the number of 180. The greater number of the cases were mild in character, and none ended fatally.”

(See p. 226 of this report.)

Winchester (326).—“There was a severe outbreak of epidemic Influenza among the warders' families, but the warders without exception escaped the disease, and in the prison three prisoners only were attacked.”

In the reports relating to 39 local prisons no mention is made of the occurrence of Influenza. In many of these it is stated that no epidemic

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occurred during the year, or that the health of the prisoners was good. The probability is, therefore, that most of them were unaffected by Influenza, but among the number in which no mention is made of Influenza is Pentonville, where we know that it occurred. No mention is made in the report of convict prisons, *i.e.*, those in which prisoners are received for sentences of five years and upward,* but one at least of these, Wormwood Scrubbs, was affected.

On the whole it would seem that (if we have the whole facts) the prison population was very lightly affected with Influenza. The daily average of prisoners in local prisons, during the year ending March 1890, was 14,389, and among these only one death from Influenza was recorded. The number of cases cannot be given.

TRINITY HOUSE.—LIGHTHOUSES and LIGHTSHIPS.

Influenza among
lighthouse and
lightship
keepers.

The following report was furnished me by the Secretary of the Trinity House, in reply to a request for information as to whether Influenza had occurred among the keepers of lightships and rock lighthouses, debarred by the circumstances of their calling from personal communication, except at rare intervals, with their fellow-men. The results are discussed on page 95 of this report.

Name of District.	Limits.	Report.
NORTH-EASTERN - - - (3 island lighthouses ; about 9 lightkeepers in all, with their families.)	From the Farn Is- lands to Flam- borough Head.	At Coquet Island lighthouse, three children of a light- keeper were ill with Influenza. Prior to the attack, communication with the town of Amble on the mainland had been fre- quent.
YARMOUTH - - - - (14 lightvessels, each with a crew of 7 hands, always on board.)	Down the East Coast from Flambro' Head to Orford, and the light- vessels in the vicinity.	One case on board the St. Nicholas lightvessel which lies about a mile from land, just off Great Yarmouth. The man went on board on the 16th December last ; after a few days he be- came unwell, was treated on board for fever and ague, got better in about 10 days, was ill again on 4th January, and came on shore at the reliefs on 15th January and went on sick list. Medical officer certi- fied Influenza. During this man's month on the light- vessel, the "Satellite" steam vessel from London delivered stores on 8th January, and steam launch from Yarmouth visited the vessel on 9th January.

* By English law sentences can be inflicted of "imprisonment" for two years or under, or of "penal servitude" for five years or upwards; there being no provision for sentences of intermediate duration between two and five years. Prisoners under sentence of imprisonment are confined in "local" prisons, and those under sentence of penal servitude in "convict" prisons, but otherwise there is little or no difference in the treatment of the two classes.

Name of District.	Limits.	Report.	On Epidemic Influenza in 1889-90; by Dr. Parsons.
LONDON - - - (15 lightvessels, each with a crew of 7 hands; 3 pile lighthouses, each with two lightkeepers on duty.)	From Orfordness to the North Foreland, inclusive of Thames Estuary, and the light vessels in the vicinity.	No cases at any of the pile lighthouses or lightvessels.	CHAP. VIII.
RAMSGATE - - - (6 lightvessels, each with a crew of 7 hands.)	North Foreland to Beachy Head, and the lightvessels along the coast between these points.	No cases reported on board any of the lightvessels.	
ISLE OF WIGHT - - - (5 lightvessels, each with a crew of 7 hands; 1 rock lighthouse with 2 keepers on duty.)	From Beachy Head to Portland, including the Isle of Wight and the lightvessels between those points.	No cases reported on board any of the lightvessels.	
PENZANCE - - - (1 lightvessel with a crew of 7 hands; 7 rock lighthouses, each having 3 keepers always at the station.)	From Start Point to Trevoze Head on west coast of Cornwall, including the Scilly Islands.	No cases in either of the rock lighthouses or lightvessel, but a lightkeeper was landed from Plymouth from the Eddystone on the 11th January, and on the 13th he was taken ill, Medical Officer certifying Influenza.	
MILFORD - - - (5 lightvessels, each having a crew of 7 hands; 2 rock lighthouses, each having always 3 keepers at the station; 1 lighthouse on Lundy Island, where there other inhabitants.)	From Trevoze Head to Cardigan Bay, including both sides of Bristol Channel.	No cases at any of the rock lighthouses or lightvessels.	
HOLYHEAD - - - (5 lightvessels, each with crew of 7; 1 rock lighthouse with 3 keepers. Lighthouse on Bardsey Island where there are other inhabitants.)	From Cardigan Bay to Whitehaven.	Three lightkeepers at Bardsey Island have suffered from Influenza. The date of previous communication with mainland is unknown.*	
CASSETS LIGHTHOUSE - (1 rock lighthouse; 3 keepers.)	Channel Islands -	No cases have occurred at the rock.	
HANOIS LIGHTHOUSE - (1 rock lighthouse; 2 keepers.)	Do. -	Do. do.	

* Mr. Hugh Rees, Medical Officer of Health for Carnarvonshire, states that the tenants of Lord Newborough, who owns Bardsey Island, went to Pwllheli on January 1st to pay their rent, returning late the same day. There had been cases of Influenza in the town of Pwllheli since the third week in December, and there was ample opportunity for the Bardsey Islanders to come in contact with infection. Within a few days after their return almost all the inhabitants of the Island (the population of which in 1881 was 132) suffered from Influenza.

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In General Post
Office, London.

THE INFLUENZA EPIDEMIC as it affected the GENERAL POST OFFICE in LONDON.

The General Post Office in London comprises a number of departments differently located.

The head-quarters of the postal service proper (*i.e.*, the department concerned with the forwarding of letters, newspapers, and parcels) are located in a large building on the east side of St. Martin's-le-Grand in the centre of the city of London. There are also 11 chief district offices, and numerous branch offices in the London postal delivery.

In a large new building on the west side of St. Martin's-le-Grand are located the following departments, *viz.* :—

Telegraphs (the majority of), Receiver and Accountant-General's (the clerical staff), Secretary's, Solicitor's, Medical (in part), Confidential Inquiry, Intelligence, Registry, and the Engineer-in-Chief's.

Of the remainder of the Receiver and Accountant-General's staff, part, consisting of male clerks, is located in St. Paul's Churchyard, and part, consisting of female clerks, in Fore Street, Cripplegate.

The Savings Bank department is in Queen Victoria Street. The Returned Letter Office and the Controller of Telegraph Stores are located in Telegraph Street, and the Money Order Office and the Controller of Postal Stores in Mount Pleasant, Clerkenwell.

All of these head offices of departments, except that at Mount Pleasant, are within half a mile of St. Martin's-le-Grand.

On putting myself into communication with the authorities at the General Post Office I found that the circumstances of the epidemic, as it affected the *London postal service*, were being investigated by Mr. R. C. Tombs, the controller of that department, whose report on the subject I append.

I therefore confined my inquiries to the *other departments* mentioned above. Of the number of new cases coming under treatment day by day in these departments I was obligingly furnished with lists by the heads of the several departments through Mr. G. Carrick Steet, the Chief Medical Officer to the Post Office.

The staff in these several departments in January 1890 is given as follows :—

				Males.	Females.	Total.
Telegraph	{	Clerks	- - -	1,770	764	} 3,099
		Messengers	- - -	565	—	
Receiver and Accountant-General	-	-	696	501	1,197	
Secretary's	-	-	307	—	307	
Solicitor's	-	-	17	—	17	
Medical	-	-	11	1	12	
Confidential inquiry	-	-	71	—	71	
Intelligence	-	-	35	—	35	
Registry	-	-	83	—	83	
Engineer-in-Chief's	-	-	92	—	92	
Savings Bank	-	-	1,056	395	1,451	
Telegraph Stores	-	-	46	—	46	
Returned Letter	-	-	74	50	124	
Money Order	-	-	199	—	199	
Postal Stores	-	-	139	—	139	
				5,161	1,711	6,872

In departments
other than Lon-
don Postal
Service.

The rules of the service are that any member of the staff absent from illness more than one day at a time must produce a certificate that he is unable to work, either from one of the medical staff of the Post Office, or from his private medical attendant.

The Medical Officer and his assistants attend at the office daily to prescribe for those who require their services, and a female Medical Officer, Miss Edith Shove, M.B., is appointed to attend to the female clerks.

I am informed by Mr. Steet that by the medical staff of the Post Office the word "Influenza" was not used, not because the existence of a specific epidemic disease was denied, but for certain reasons of official expediency; the cases being designated by the following names, viz., feverish catarrh, feverish cold, or catarrh with lumbar pains, &c.* Among the certificates, however, received from private medical men during the period of the epidemic, "Influenza" figures largely. That the bulk of the cases due to the epidemic were comprised under the above headings, is shown by the consideration, that if we deduct from the daily total number of new cases those certified as "Influenza" and "catarrh, &c.," the remainder varies comparatively little. Thus, the average daily number of cases of illness other than "Influenza" and "catarrh" being in the period, December 16th to February 28th, 39, the highest daily numbers of such cases were 71 on December 30th, 70 on January 1st, 68 on January 8th, 67 on January 2nd, and 65 on December 16th. Again, in the Telegraph Department the number of new cases of sickness, other than "Influenza" or "catarrh," was in January 624, or 23 per working day, and in March, when the epidemic was over, 503, or 19 per working day.

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TABLE showing DAILY NUMBERS of NEW CASES of SICKNESS between December 16th, 1889, and February 28th, 1890, in Departments of the General Post Office other than London Postal Service.

Day of Month.	December.		January.		February.	
	Total cases.	Influenza and Catarrh.	Total cases.	Influenza and Catarrh.	Total cases.	Influenza and Catarrh.
1			181	111	39	9
2			244	177		Sunday.
3			196	148	89	36
4			222	188	90	36
5				Sunday.	62	28
6			342	285	60	15
7			268	220	49	12
8			227	159	49	22
9			197	155		Sunday.
10			168	137	53	23
11			125	83	67	30
12				Sunday.	62	23
13			164	117	64	30
14			138	90	40	18
15		Sunday.	112	68	65	37
16	109	44	103	56		Sunday.
17	70	32	87	50	99	41
18	64	29	79	47	71	28
19	66	28		Sunday.	67	32
20	55	30	79	42	61	26
21	60	29	75	34	54	32
22		Sunday.	72	33	44	18
23	59	20	61	28		Sunday.
24	46	20	54	21	83	43
25		Holiday.†	45	14	65	38
26	25	8		Sunday.	48	24
27	94	47	56	25	55	22
28	107	55	60	19	28	14
29		Sunday.	47	14		
30	183	112	58	19		
31	155	106	56	24		

* In this report cases coming under these and similar designations are spoken of for shortness as "Catarrh, &c."

No cases are returned on Sundays or on Christmas Day; persons taken ill on those days coming on the list on the following working day. Hence the number of cases of sickness on Mondays is generally above the average, and it tends to be below the average on Saturdays. December 26th was observed as a holiday in all but the Telegraph Department, hence the number of persons newly absent from duty through sickness on that day was small.

The number of cases of Influenza and "catarrh" began to rise on December 27th, and attained its maximum on January 6th, when the total number of new cases of illness was 331, or more than four times as great as the average of the Mondays in February. From this date the numbers steadily and rapidly declined, until in the week ending January 25th the number of new cases was less than it had been in that ending December 21st. There was a small rise on some days about the middle and end of February, but the cases at this time were probably mostly simple catarrh due to the frost and cutting winds which prevailed about then, few of them being termed "influenza."

The following figures, however, relating to the Telegraph Department seem to show that a remnant of the Influenza epidemic lingered on through February:—

Cases in 1890.	January.	February.	March 1st to 28th.
"Influenza" - - - -	147	15	5
"Catarrh," &c. - - - -	1,080	311	181
All kinds of illness - - - -	1,851	772	662

Altogether between December 16th and February 28th, 639 cases were returned as Influenza; all these, as before explained, being so certified by medical practitioners other than the medical staff of the Post Office. Of the 639 cases returned as Influenza, 56 occurred in the latter half of December, 545 in January (mostly in the first half), and 38 in February; there were also a few cases so certified in March, but the returns are not complete for all the departments.

During the period December 16th to February 28th, 2,913 cases occurred returned as "catarrh," "feverish cold," or other similar designation, viz., 495 in the latter half of December, 1,819 in January, and 599 in February. This number comprises all the cases of Influenza treated officially, but doubtless includes many cases of ordinary catarrh not Influenza.

In the Telegraph Department in January, 1,080 cases were returned as "feverish cold," "catarrh," &c., and in March 181; the difference 899 may be ascribed to the Influenza epidemic. Adding the 147 cases in January certified as Influenza, and say 122 in December, we have 1,186 cases in that department due to the epidemic; or 38 per cent. of the staff.

As an approximation to the total amount of sickness due to the Influenza epidemic, we may take the number of cases returned as "influenza," "feverish cold," "febrile catarrh," &c., during the three weeks ending January 18th. We shall thus, no doubt, include many cases of ordinary catarrh which were not Influenza; but on the other hand we shall leave out some cases of Influenza before and after the

period taken, and also a certain increase—small, as has already been said—in the number of cases other than Influenza or catarrh which occurred at the time of the epidemic, and these errors in opposite directions may be looked upon as likely nearly to balance one another. The figures for the several departments are as follows, those for the smaller departments located in one building being grouped together:—

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Departments.	Number of Staff.	Cases of "Catarrh," &c.	Cases of "Influenza."	Total.	Per cent.
Savings Bank - -	1,451	304	189	493	34·0
Telegraph - -	3,099	1,049*	144	1,193	38·5
Receiver and Accountant-General - -	1,197	261	103	364	30·5
Smaller departments in West Building, St. Martin's-le-Grand -	617	81	45	126	19·8
Money Order and Postal Stores - -	338	76	26	102	30·2
Returned Letter and Telegraph Stores -	170	20	11	31	18·2
Total - -	6,872	1,791	518	2,309	33·6

* Of this number 446 were officially certified by the designations used for Influenza.

The general result is that the larger departments, in which many persons worked together in one room, had a larger proportion of the staff invalidated than the smaller ones; the only exception being the Money Order and Postal Stores Departments, which, though small, had a proportion of sick nearly equal to the average. The highest proportion was in the Telegraph Department. Of the staff in this department, about 2,000* clerks work in two large galleries at the top of the building, containing 1,054 instruments. There are also 565 messengers.

The proportion of cases of "Influenza" and "catarrh, &c." in this department during the three weeks ending January 18th has been, among the male clerks, 37·4 per cent.; among the female clerks 35·8 per cent., and among the messengers 46·1 per cent.

It has been suggested that the heavy incidence of the epidemic upon the Telegraph Department may have been due to the ozone given off from the batteries used in producing the electrical currents. The batteries, however, are not near the instrument room, but are in a cellar in a different part of the building, though there is a shaft conveying wires from the Battery Room direct into the Instrument Rooms. Of the battery men I could not learn that an unusual number had been affected.

Among the whole staff in the several departments the proportions of males and females affected were almost the same, being 34 per cent. among the males, and 33·1 per cent. among the females.

The epidemic developed nearly *pari passu* in all the departments, but the daily number of cases of Influenza and "catarrh, &c.," began to

* The whole of the 2,000 clerks are not in these rooms at the same time; some of them working at night.

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show a distinct rise in the Telegraph Department about two days earlier than in the others, viz., on December 27th. (It must be noted that some of the male staff in the Telegraph Department were on duty on December 26th, which was observed as a holiday in the other departments.)

In almost all the departments the maximum number of cases occurred on January 6th, but January 5th, being Sunday, persons taken ill on that day would be counted off duty first on January 6th.

In London
Postal Service.

As regards the prevalence of Influenza in the *London Postal Service* (numbering 12,864), I cannot do better than give the following report by Mr. R. C. Tombs, controller to that department, with its appended tables, to which, by Mr. Tombs's courtesy, I add some supplementary tables to show the progress of the epidemic in its earlier stage.

(It should be observed that Mr. Tombs's figures are of the daily number of absentees through sickness, whereas those previously given by me are of the daily number of new cases. The two sets of figures are therefore not comparable.)

INFLUENZA EPIDEMIC.

London Postal Service,
7th March 1890.

Mr. Tombs's
report.

“THE SECRETARY,

“THE Influenza epidemic which will make memorable the end of the year 1889 and the commencement of 1890 in the London post offices may now be said to have spent its force, and a few facts and figures with regard to the extent of its ravages among the officers of that Department may perhaps be interesting.

“The London Postal Service Staff began to be affected immediately after Christmas, and the strain necessarily imposed upon all grades at that season must be taken as having some bearing upon the large numbers of officers who suffered from the disease.

“The following dates show the commencement of a marked rise in the number of absentees, viz. :—

December 27th.	December 30th.	December 31st.
540	635	753

“On the 1st January 1890 there were 924 absentees, on the 4th there was an increase of 500, bringing the total up to 1,426, and there was an addition for the next three days of 200 a day. For the 4 days commencing with the 8th January the numbers remained above 2,000, or at more than 15 per cent. of the entire force. On the 13th January a fall commenced, and by the 24th the absentees had declined to 924, the same number as on the 1st January, and to the ordinary number on the 17th February. The progress of the epidemic in its rapid rise and gradual fall will perhaps best be seen from the following statement :—

Dec. 27th.	Jan. 1st.	Highest point. Jan. 9th.	Jan. 24th.	Feb. 6th.	Feb. 17th.
540	924	2,057	924	533	440
5 days.	8 days.	15 days.	13 days.	11 days.	

"It may be interesting to see also the temperature on these days as taken at 6 a.m. and 6 p.m. outside the General Post Office, viz. :—

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Time.	Dec. 27th.	Jan. 1st.	Jan. 9th.	Jan. 24th.	Feb. 6th.	Feb. 17th.
6 a.m. -	42	34	44	40	38	43
6 p.m. -	44	38	51	51	44	49

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"To give the number of absentees from Influenza alone would not therefore afford a fair view of the actual state of the case, so I have included sickness of all kinds."

"Thus, taking the average for January 1890, there were 1,346 officers absent from sickness of all kinds daily, and of these 507 only were certified as suffering from Influenza. The average daily absence during January 1889 was 430, and a difference of 916 a day remains therefore to be accounted for. I thought that perhaps some other diseases might have been above the average, but I find that catarrhal affections of various kinds (*e.g.*, "catarrh," "cold," "bronchitis") greatly predominated over other ailments, and as there is no other cause of frequent occurrence given in the certificates, except rheumatism, I think the difference in the absences of January 1889 and 1890 must be set down to the Influenza epidemic in its several stages.

"The total number of officers absent from sickness of all kinds during January 1889 was 2,391, and during January 1890, 5,221, and of the latter number 1,831 were certified as being from cases of Influenza. Up to the date of the last return, February 20th, 1876 cases of Influenza have been certified.

"An examination of the statistics in detail discloses the following facts:—

"The postmen were the most seriously affected of any class of officers. 725 men, or about 13 per cent. of the whole force of London postmen, were away daily on the average. The highest absence on one day was 1,029, or 18 per cent. of the force.

"The telegraph messengers who form the rest of the outdoor force were absent in a much smaller proportion, about 7 per cent., this showing apparently that adults were more affected than the young.

"No branch of the Service can be said to have escaped. Clerks and mail cart drivers, to take opposite extremes, alike suffered, so many as 24 of the former out of a total number of 150, or 16 per cent., and 80 of the latter out of a total number of 450, or 17·8 per cent., having been absent in one day.

"The horses employed by the Department were largely affected, an epidemic of 'influenza' breaking out among them some time in advance of its appearance among the staff. The contractors have supplied me with the following figures which may be of interest:—

Names of Contractors to whom the Horses belong.	Epidemic Period.		No. of Horses in use.	Proportion affected at one Time.	Duration of Attack.
	From	To			
Mr. Webster - - -	1889. May	1889. Nov.	120	Per cent. 25	21 to 60 days.
Messrs. McNamara & Co. -	Nov.	1890. Jan.	330	14	21 days.
Mr. Birch - - -	Oct.	1889. Nov.	200	10	15 to 17 days.

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"The symptoms were very similar to those experienced by human beings and the complaint is reported to have run through the whole stud. The horses standing at the Notting Hill stables were the most seriously affected.

"I am very sorry to have to record that two fatal cases occurred among the staff, one being that of a counterwoman in the Northern District, aged 39, and the other of a postman in the South-Western District, aged 22.

"Established officers who received sick pay, and unestablished who did not, were away in nearly the same proportions, viz., 10·8 and 10·3 per cent., and the suggestion made in one of the daily newspapers that men receiving sick benefit would be found to be absent in much greater numbers than those who did not, had little force therefore as regards Post Office servants. I have been endeavouring to find in local circumstances some explanation for the number of absences, but I cannot deduce much from the figures which I have obtained. Thus the suburban men, who usually have less sick absence than the town men, were away in the proportion of 12 per cent., while the town numbers gave only 10 per cent. The low-lying sub-districts suffered less than those on higher ground, the proportions to the force being 9 per cent. and 11 per cent., and this seems to controvert the theory of the "Malaria" nature of the disease. Of the various districts taken as a whole the South-Western,* including Wandsworth,† suffered the most, and the Western town district the least. In looking at these figures, however, it, must be borne in mind that although the sorters and postmen were working all day in the districts to which they are attached, they were in many cases sleeping in quite a different locality.

"It was thought at one time that infection might have been conveyed by the foreign mails, but this is scarcely borne out by the facts of the case, the proportion of sick absence among the officers dealing with the mails as they arrived being 11 per cent. out of 369, while the proportion for the rest of the force was 12 per cent. of 12,530 persons.

"The general characteristics of the disease seem to have been the same everywhere. Sickness, dizziness, severe pains in the back and limbs, with much headache, were usually complained of. There was also great weakness, and cases occurred of men fainting in the sorting office and falling down in the street while on delivery. The seizure was often very sudden.

"A thick fog (on 1st January) and a severe frost (from the 6th to the 9th January) occurred at the time the epidemic was at its height.

"The fact that in spite of the very large number of absences the work was carried out with little alteration from the usual lines is a proof both of the amount of elasticity possessed by the staff arrangements, and of the general willingness of the force to meet an emergency, the latter point having been acknowledged by the Postmaster-General in an appreciatory minute. Advantage was taken of the auxiliary force to bring on for additional duties many men who are usually employed only for a few hours, and temporary men and telegraph messengers, just off the Christmas work, to the number of 236 and 164 respectively were brought in for postal duties. Even with this assistance, however, the strain was very severe, and had it continued much longer it would have been necessary to have curtailed the public accommodation to some extent. As it was, this was happily avoided, with but an occasional exception, and I am glad to be able to say that very few complaints were received from the public during the whole time of difficulty and pressure.

"R. C. TOMBS,
"Controller."

* Localities :—Brixton, Chelsea, Clapham, Earls Court, Pimlico, and South Kensington.

† Localities :—Barnes, Battersea, Putney, Streatham, and Wimbledon.

LONDON POSTAL SERVICE.—INFLUENZA EPIDEMIC.

STATEMENT OF DAILY SICK ABSENCE among the FORCE for the PERIOD from December 27th, 1889, to February 17th, 1890.

DISTRICT OR OFFICE.	Total authorized Force.	Average Number absent at ordinary times.	NUMBER OF OFFICERS ABSENT THROUGH SICKNESS.																																																				
			Dec. 24.	Dec. 25.	Dec. 26.	Dec. 27.	Dec. 28.	Dec. 29.	Dec. 30.	Dec. 31.	Jan. 1.	Jan. 2.	Jan. 3.	Jan. 4.	Jan. 5.	Jan. 6.	Jan. 7.	Jan. 8.	Jan. 9.	Jan. 10.	Jan. 11.	Jan. 12.	Jan. 13.	Jan. 14.	Jan. 15.	Jan. 16.	Jan. 17.	Jan. 18.	Jan. 19.	Jan. 20.	Jan. 21.	Jan. 22.	Jan. 23.	Jan. 24.	Jan. 25.	Jan. 26.	Jan. 27.	Jan. 28.	Jan. 29.	Jan. 30.	Jan. 31.	Feb. 1.	Feb. 2.	Feb. 3.	Feb. 4.	Feb. 5.	Feb. 6.	Feb. 7.	Feb. 8.	Feb. 9.	Feb. 10.	Feb. 11.	Feb. 12.	Feb. 13.	Feb. 14.
Controller's Office -	115	1.3	1	1	1	1	3	2	5	4	6	6	3	6	11	10	12	10	8	12	10	12	12	12	8	8	8	7	8	8	5	5	1	1	2	2	2																		
Inland, Newspaper, Registered Letter, and E.C. Offices -	3,020	95	76	137	226	247	222	267	306	314	333	419	418	446	532	518	490	409	381	375	553	342	327	327	272	248	245	228	218	183	185	176	166	149	152	152	141																		
Foreign Branch -	274	5	9	15	20	17	21	27	37	34	36	37	52	37	69	84	69	64	50	51	40	42	41	27	23	22	23	21	21	20	20	23	18	13	8	14	13																		
G.P.O. Parcel Depot -	298	2	6	21	37	49	40	53	56	60	55	64	57	58	52	47	47	39	37	35	28	28	24	25	17	19	19	16	14	15	8	11	10	9	9	8	8																		
Travelling Post Office	196	6	10	17	17	16	14	11	12	13	15	16	21	20	21	23	29	29	28	24	20	19	17	18	16	14	11	12	12	11	10	8	7	5	6	9	8																		
Northern District -	1,036	17	4	7	7	17	37	36	56	60	65	106	134	166	163	138	172	167	106	123	117	116	116	113	96	90	81	81	78	61	50	52	45	30	29	29	28																		
Eastern District -	1,110	18	11	12	39	34	36	35	46	56	64	97	160	154	150	161	164	180	135	130	117	118	121	124	88	80	81	81	81	74	60	53	41	51	38	41	33																		
South-Eastern District	1,200	20	29	36	54	47	65	73	82	94	94	126	118	131	135	166	175	167	127	132	133	134	141	101	97	98	98	92	96	88	81	64	30	36	28	28	19																		
Western District -	888	19	12	17	22	24	21	31	37	47	52	51	67	85	100	105	162	94	74	76	75	74	75	68	56	57	52	45	47	49	37	37	30	25	21	21	22																		
West Central District	701	8	7	10	15	23	24	25	35	55	29	48	60	78	98	97	95	89	77	75	78	65	59	38	36	48	48	44	40	37	30	28	24	22	21	22	20																		
South-Western District	1,473	30	24	29	49	48	50	76	101	131	142	219	260	284	315	315	311	315	238	225	216	217	223	219	154	146	131	124	121	128	95	83	71	87	82	77	70																		
North-Western District	787	11	8	10	16	20	28	38	52	60	65	82	97	96	115	168	116	119	90	160	94	102	100	94	78	70	59	55	56	53	40	41	34	32	26	20	32																		
Paddington District -	897	17	17	28	45	53	51	50	53	67	78	78	82	89	102	113	114	113	90	91	97	87	89	78	45	56	54	50	49	42	41	40	30	29	31	30	24																		
Wandsworth District	427	5	—	1	5	5	11	12	20	29	49	55	51	73	83	80	88	85	72	72	70	77	75	69	47	59	44	42	38	35	22	23	16	17	14	7	7																		
Norwood District -	228	2	—	—	2	7	10	14	17	16	14	12	29	34	47	47	44	45	36	30	28	29	31	34	27	29	28	32	32	35	24	24	12	10	8	10	6																		
Ealing District -	90	1	1	1	1	1	1	—	1	1	5	12	14	15	19	20	21	15	16	18	18	18	15	12	12	12	12	11	9	9	6	7	6	5	5	4																			
Bag Room -	45	5	1	1	2	1	1	2	3	4	3	5	4	5	4	4	5	4	4	5	6	6	5	3	3	2	2	2	3	2	2	3	2	2	3	3																			
Total -	12,864	297.8	216	343	540	612	635	753	924	1,044	1,087	1,426	1,613	1,800	2,030	2,037	2,033	2,001	1,560	1,571	1,514	1,486	1,474	1,385	1,095	1,049	996	944	924	866	728	676	545	533	482	487	440																		
Increase over an ordinary day -		-41 Decrease.	86	281	355	378	496	667	787	830	1,169	1,356	1,549	1,773	1,800	1,786	1,744	1,309	1,314	1,257	1,229	1,217	1,128	838	792	739	687	607	660	471	410	288	276	225	230	183																			

LONDON POSTAL SERVICE.—INFLUENZA EPIDEMIC.

STATEMENT OF DAILY SICK ABSENCE certified as from INFLUENZA from January 4th to February 17th, 1890.

DISTRICT OR OFFICE.	Total authorized Force.	NUMBER OF OFFICERS ABSENT FROM "INFLUENZA."																											
		January 4.	January 6.	January 7.	January 8.	January 9.	January 10.	January 11.	January 12.	January 13.	January 14.	January 15.	January 16.	January 17.	January 18.	January 19.	January 20.	January 21.	January 22.	January 23.	January 24.	January 25.	January 27.	January 30.	February 3.	February 6.	February 10.	February 13.	February 17.
Controller's Office - - -	115	—	—	4	2	3	3	4	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	—	—	—	1	1	1
Inland, Newspaper, Registered Letter, and E.C. Offices - - -	3,020	81	54	83	108	118	117	126	87	79	72	80	73	62	43	39	35	30	27	25	14	9	4	7	6	4	2		
Foreign Branch - - - - -	274	8	18	8	29	32	28	26	19	19	14	17	17	14	11	11	6	8	6	5	5	5	4	3	2	3	3		
G.P.O. Parcel Depôt - - -	298	7	7	10	8	7	7	5	7	7	7	7	7	6	2	2	3	3	3	3	2	1	1	1	—	—	—		
Travelling Post Office - - -	196	3	5	7	9	12	15	14	11	11	9	8	6	5	4	2	2	3	3	3	2	—	—	—	—	1	1		
Northern District - - - - -	1,036	15	42	67	42	49	53	55	49	54	54	52	47	46	38	32	30	31	30	20	20	21	12	12	6	5	4		
Eastern District - - - - -	1,110	13	47	63	91	95	110	129	80	73	55	55	51	54	31	31	28	28	25	24	15	10	5	3	2	2	—		
South-Eastern District - - -	1,209	22	28	36	40	47	50	51	35	43	45	47	49	33	29	29	27	26	27	20	22	20	4	6	6	5	3		
Western District - - - - -	888	12	16	26	28	34	37	40	33	27	25	21	24	21	19	16	15	16	15	15	12	8	4	3	1	—	—		
West Central District - - -	701	1	2	8	12	13	14	20	22	25	24	21	20	19	14	12	12	11	12	10	5	5	3	2	1	—	—		
South-Western District - - -	1,473	133	161	202	197	218	212	219	143	128	124	118	116	112	74	72	62	61	56	41	23	17	17	15	17	12	12		
North-Western District - - -	787	35	47	65	63	69	77	79	61	67	60	69	60	58	43	41	30	27	24	28	22	21	10	9	10	9	6		
Wandsworth District - - - -	427	6	13	23	23	23	26	27	30	33	37	41	34	35	28	28	24	24	21	19	12	9	5	2	2	1	1		
Paddington District - - - - -	897	27	36	43	53	60	64	62	48	55	60	50	49	42	25	22	26	25	20	21	14	12	4	4	2	2	1		
Norwood District - - - - -	298	3	—	14	17	20	13	19	17	14	10	8	9	11	8	9	7	10	10	10	8	5	3	2	—	1	2		
Ealing District - - - - -	90	—	5	9	9	12	10	12	3	7	6	5	5	2	2	1	1	2	1	1	1	2	2	1	—	—	—		
Bag Room - - - - -	45	—	—	5	—	2	2	2	2	2	2	2	2	—	—	—	—	—	—	—	—	—	—	—	—	1	1		
Total - - - - -	12,864	366	481	673	731	814	838	890	650	647	607	604	572	523	374	350	311	307	282	262	197	151	78	72	54	52	37		
Number of fresh cases of Influenza - - - - -	—	110	286	154	163	127	95	79	114	93	57	69	41	31	32	18	11	25	5	9	9	10	11	9	7	5	4		

LONDON POSTAL SERVICE.—INFLUENZA EPIDEMIC.

STATEMENT of Daily Sick Absence certified as from "Influenza" from December 16th, 1889, to January 3rd, 1890.

DISTRICT OR OFFICE.	NUMBER OF OFFICERS ABSENT FROM "INFLUENZA" ON																
	December 16.	December 17.	December 18.	December 19.	December 20.	December 21.	December 23.	December 24.	December 25.	December 26.	December 27.	December 28.	December 30.	December 31.	January 1.	January 2.	January 3.
Controller's Office - - -	—	—	—	—	—	—	—	1	1	1	1	1	1	—	—	—	—
Inland, Newspaper, Registered Letter, and E.C. Offices.	2	1	—	—	—	—	1	1	1	4	5	7	13	11	15	18	18
Foreign Branch - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	1	7	7	8
G.P.O. Parcel Depot - - -	—	—	—	—	—	—	—	—	—	—	—	—	3	3	3	4	4
Travelling Post Office - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	3
Northern District - - -	—	—	—	—	—	—	—	—	—	—	—	—	1	2	12	17	22
Eastern District - - -	—	—	—	—	—	—	—	—	—	—	2	—	—	—	9	8	20
South-Eastern District - - -	—	—	—	—	—	1	1	1	1	1	1	2	2	5	6	6	9
Western District - - -	4	2	2	1	—	—	1	2	2	2	3	2	4	4	8	10	17
West Central District - - -	—	—	—	—	—	—	—	—	—	—	1	1	1	2	2	2	4
South-Western District - - -	—	—	—	—	—	—	—	—	—	1	1	3	8	17	28	50	56
North-Western District - - -	—	—	—	2	2	1	1	1	2	3	5	13	22	34	41	46	46
Paddington District - - -	1	—	1	1	2	1	3	2	2	3	12	9	5	9	9	13	18
Wandsworth District - - -	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	2	2
Norwood District - - -	—	—	—	—	—	—	—	—	—	—	1	1	2	4	6	7	9
Ealing District - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bag Room - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	7	3	3	2	4	4	8	9	8	14	31	33	53	80	140	186	236

LONDON POSTAL SERVICE.—INFLUENZA EPIDEMIC.

STATEMENT of Daily Sick Absence among the Force for the Period from the 16th to the 23rd December 1889 inclusive.

District or Office.	Number of Officers absent through Sickness on						
	December						
	16.	17.	18.	19.	20.	21.	23.
Controller's Office - - -	—	—	—	—	—	—	—
Inland, Newspaper, Registered Letter, and E.C. Offices - - -	126	130	124	117	108	115	90
Foreign Branch - - -	7	7	11	11	10	7	9
G.P.O. Parcel Depot - - -	17	17	13	11	10	11	8
Travelling Post Office - - -	1	1	5	6	6	7	9
Northern District - - -	16	15	11	12	11	11	7
Eastern District - - -	24	25	24	31	31	29	18
South-Eastern District - - -	26	29	31	19	27	30	14
Western District - - -	24	19	19	18	17	16	13
West Central District - - -	12	12	10	10	10	7	6
South-Western District - - -	35	42	42	41	33	32	23
North-Western District - - -	26	24	20	19	18	17	10
Paddington District - - -	21	24	28	30	37	29	16
Wandsworth District - - -	6	5	5	4	4	4	2
Norwood District - - -	5	4	5	5	3	2	—
Ealing District - - -	1	1	1	1	1	1	1
Bag Room - - -	3	1	1	1	1	1	1
Totals - - -	350	356	350	336	327	319	227

LONDON POSTAL SERVICE.—INFLUENZA EPIDEMIC.

On Epidemic
Influenza in
1889-90; by
Dr. Parsons.

CHAP. VIII.

STATEMENT of the number of Officers, usually employed upon Foreign Letter and Parcel Duties, who were absent from duty on account of illness each day from the 2nd December 1889 to the 8th January 1890.

Dates.	Number of Officers absent on account of					
	Influenza.			Other Causes.		
	Foreign Letter Staff.		Foreign Postal Staff.*	Foreign Letter Staff.	Foreign Parcel Staff.	
	Continental Officers.	Colonial Officers.				
December 2	-	—	—	—	9	1
" 3	-	—	—	—	8	1
" 4	-	—	—	—	10	1
" 5	-	—	—	—	12	1
" 6	-	—	—	—	10	1
" 7	-	—	—	—	9	1
" 9	-	—	—	—	10	1
" 10	-	—	—	—	11	1
" 11	-	—	—	—	11	1
" 12	-	—	—	—	11	1
" 13	-	—	—	—	13	1
" 14	-	—	—	—	11	2
" 16	-	—	—	—	9	2
" 17	-	—	—	—	9	2
" 18	-	—	—	—	13	3
" 19	-	—	—	—	13	1
" 20	-	—	—	—	13	—
" 21	-	—	—	—	9	—
" 23	-	—	1	—	9	—
" 24	-	—	1	—	9	—
" 25	-	—	—	—	9	—
" 26	-	—	—	—	16	1
" 27	-	—	—	—	21	4

Dates.	Number of Officers absent on account of				
	Influenza.			Other Causes.	
	Foreign Letter Staff.		Foreign Parcel Staff.*	Foreign Letter Staff.	Foreign Parcel Staff.
	Continental Officers.	Colonial Officers.			
December 28	-	—	—	18	3
„ 30	-	—	3	23	6
„ 31	-	—	1	27	5
January 1	-	—	4	31	9
„ 2	-	—	4	27	6
„ 3	-	—	5	31	5
„ 4	-	2	8	32	6
„ 6	-	4	14	34	5
„ 7	-	4	19	38	5
„ 8	-	5	24	40	4

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* All the officers in the Foreign Parcel Room are engaged at some time, during the day on Continental work.

The number of Officers employed on Foreign duties are—

Letter 274 } 334.
Parcel 60 }

9th January 1890.

THE INFLUENZA EPIDEMIC IN THE BANK OF ENGLAND, LONDON.

The following figures are compiled from returns furnished to the Board by Mr. A. H. Smee. The head office of the Bank of England is in Threadneedle Street, in the City of London, where most of the departments are located; but there are branches in Regent Street, and at the Law Courts. The total staff is 1,117, most of whom are in the main building; the staff at the branches numbering only 55. Of this staff between December 20th, 1889, and February 1st, 1890, 325 were absent on account of illness. Their maladies as described by themselves were as follows:—

“Influenza”	-	-	-	-	143
Symptoms as described like Influenza	-	-	-	-	88
Bronchitis and catarrh	-	-	-	-	41
Other illnesses	-	-	-	-	53
					<u>325</u>

The proportion of the staff attacked by “Influenza” was 12·8 per cent.; or, adding the cases which from the symptoms as described were probably Influenza, 20·8 per cent. Probably also some of the cases

On Epidemic
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under the heading of bronchitis and catarrh were due to the Influenza epidemic. The aggregate number of working days lost by those who suffered from "Influenza" was 1,341, or 9.4 days each; by those with symptoms probably Influenza, 733 days, or 8.3 each, and by those with bronchitis and catarrh, 340 days, also 8.3 days each on an average. Taking the two former categories as representing the amount of sickness due to the Influenza epidemic, the total loss of time thereby occasioned was 2,074 days, or nearly two days for each of the staff.

The dates of commencement of the cases were as follows:—

Date.	"Influenza."	Symptoms of Influenza.	Bronchitis and Catarrh.
December 20, 1889	1	—	—
" 21, "	1	—	—
" 22, "	1	—	—
" 23, "	—	—	—
" 24, "	1	1	—
" 25, "	1	—	—
" 26, "	—	—	1
" 27, "	—	1	—
" 28, "	4	2	—
" 29, "	—	—	—
" 30, "	2	—	—
" 31, "	6	1	2
January 1, 1890	7	3	1
" 2, "	10	5	2
" 3, "	10	6	2
" 4, "	9	5	5
" 5, "	2	3	3
" 6, "	14	8	1
" 7, "	4	5	4
" 8, "	11	4	1
" 9, "	11	5	1
" 10, "	6	5	2
" 11, "	10	4	2
" 12, "	1	3	—
" 13, "	5	3	2
" 14, "	6	7	2
" 15, "	5	1	2
" 16, "	6	3	—
" 17, "	1	3	2
" 18, "	—	5	4
" 19, "	1	—	—
" 20, "	3	1	—
" 21, "	1	—	—
" 22, "	—	—	—
" 23, "	3	2	1
" 25, "	—	—	1
" 27, "	—	1	—
February 1, "	—	1	—
Total	143	88	41

Inquiries were made as to whether the patients were the first persons attacked in their respective households, or whether they were secondarily affected after there had been other similar cases in their households. Of the 143 cases returned as Influenza, 95 were first or single cases, and 48 secondary cases; of 19 cases in December 16 were primary cases. Of the cases with symptoms like Influenza 49 out of 88 were primary, and of those of bronchitis and catarrh 29 out of 41 were primary.

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LONDON AND WESTMINSTER BANK.

Returns were also procured by Mr. A. H. Smee of the sickness among the staff of the London and Westminster Bank. These returns were similar to those of the Bank of England, except that instead of asking whether the case was the first one in the household, it was asked whether any other cases of illness occurred at the same time in the respective households.

In London and
Westminster
Bank.

The facts are thus shown in tabular form:—

Office.	Number of Staff.	Absent through Illness.		Cases in January 1890.				Per-cent. Attacked with Influenza or Symptoms thereof.
		January 1889.	January 1890.	Influenza.	Symptoms of Influenza.	Bronchitis and Catarrh.	Other illness.	
Central - - -	217	13	60	30	12	11	7	19·4
Country - - -	65	4	24	17	2	3	2	29·1
Westminster - - -	59	6	18	14	—	3	1	23·8
Bloomsbury - - -	32	2	6	4	1	—	1	15·6
Southwark - - -	35	1	13	11	1	—	1	34·4
Eastern - - -	19	1	4	2	—	—	2	10·6
Marylebone - - -	26	2	8	5	—	—	3	19·2
Temple Bar - - -	23	—	3	1	—	—	2	4·3
Lambeth - - -	15	—	4	3	—	1	—	20·0
Victoria Street, Hampstead Road, and St. James's Square - - -	11	—	5	2	—	1	2	18·2
Total - - -	502	29	145	89	16	17	23	21·0
Aggregate days lost - - -	-	-	-	870	104	167	363	
Average days lost per case - - -	-	-	-	9·7	6·5	9·8	15·7	
Other cases of illness in same households as patients with - - -	-	-	-	48	11	4	1	

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Of those who were ill during a part of January, the following are the dates of the commencement of the respective illnesses:—

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Date.	Cases of			
	Influenza.	Symptoms of Influenza.	Bronchitis and Catarrh.	Other kinds.
Before December 23	—	—	1	3
December 23	1	—	—	—
„ 24	1	—	—	—
„ 25	—	—	—	—
„ 26	1	—	—	—
„ 27	—	—	1	—
„ 28	—	—	—	—
„ 29	—	—	—	—
„ 30	1	—	1	2
„ 31	1	—	—	—
January 1	8	3	3	1
„ 2	5	1	2	—
„ 3	8	—	1	1
„ 4	6	2	1	—
„ 5	4	—	1	—
„ 6	9	1	1	1
„ 7	9	1	1	—
„ 8	8	—	1	3
„ 9	2	1	—	2
„ 10	5	1	—	—
„ 11	5	1	—	1
„ 12	—	—	—	—
„ 13	2	2	—	—
„ 14	2	—	—	—
„ 15	5	1	—	1
„ 16	—	1	—	2
„ 17	1	—	—	1
„ 18	—	—	1	1
„ 19	—	—	—	1
„ 20	3	1	—	—
„ 21	1	—	—	—
„ 22	—	—	—	—
„ 23	—	—	—	—
„ 24	—	—	—	—
„ 25	—	—	—	1
„ 26	—	—	—	—
„ 27	1	—	—	—
„ 28	—	—	—	1
„ 29	—	—	2	—
„ 30	—	—	—	1
„ 31	—	—	—	—
Total	89	16	17	23

The epidemic showed itself first in the country branch, which is located in the same building as the central office. In this branch the greatest number of cases in one day (4) was on January 1st. At the Head Office the greatest number of cases on one day (6) was on January 6th.

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It will be observed that the proportion of the staff affected, the number of days lost per case, and the general course of the epidemic, were almost exactly the same in the London and Westminster Bank as in the Bank of England.

INFLUENZA as it affected the RAILWAY SERVICE.

An inquiry was addressed by me to the managers of the principal railway lines leading out of London asking for information as to the proportion of their staff in different departments who had been affected with Influenza. The object of this inquiry was especially to learn whether those classes of men were most affected who, like engine-drivers, were most exposed to the atmosphere or to the vicissitudes of the weather, or those who were employed indoors, but were brought into closer relation with the travelling public or with one another. If the cause of the Influenza epidemic were something in the atmosphere at large, the former class might be expected to suffer from it in the largest proportion; if, on the other hand, it were carried about by human agency, the latter might be expected to suffer most. The figures with which I have been courteously furnished by the managers of several of the larger railways, show that, speaking generally, the latter was the case.

In railway ser-
vice.

GREAT WESTERN RAILWAY.

Mr. Lambert, general manager, writes:—

“With regard to the proportions in which the various grades of servants were absent from duty owing to the epidemic, I have obtained some information from the benefit societies to which nearly the whole of the staff employed at weekly wages belong, and I send you herewith a statement showing the total number of men of each grade employed, and the number and per-centage of those away ill. I have also given similar information with reference to the clerks employed in the general offices and in the goods and passenger departments. The clerks in the general offices and goods department do not come into contact at all with the travelling public, but the larger proportion of those in the passenger departments do; yet in some of the general offices the proportion of absentees was very high.”

Great Western
Railway.

[In a subsequent letter Mr. Lambert informs me that the clerks in the general offices are employed in large rooms, a number together; many being at Paddington; while the passenger and goods department clerks are employed in small detachments in a number of offices up and down the line. Many of them were therefore located at places where the epidemic had not run its course by the end of January.]

“It will be noticed that while the illness amongst the guards was proportionally higher than in any other grade (which might be considered to support the theory that the disease was carried from place to place by the travelling public), the engine-drivers and firemen were much more free from the disease than the clerks, who do not travel at all.

“The following extract from a letter I have received from our locomotive engineer, dated February 28, 1890, may be of interest.

“‘In a large number of cases where the illness is stated to be ‘catarrh,’ ‘bronchitis,’ &c., it is really due to the Influenza epidemic. In fact several cases have come under notice, in which, in the first certificate, the illness has been described as severe cold, or catarrh, and a subsequent certificate has attributed it to Influenza.’

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“ ‘ You will notice that in the London district the maximum number of cases occurred in January. In Swindon the maximum was reached in the first fortnight of February, while in South Wales, South Devon, and the northern division of the system the maximum was at a later period. In fact I think it is probable that in those parts of the system farthest from London the epidemic has not yet appeared to its fullest extent.’ ”

STATEMENT showing the STAFF of the under-mentioned GRADES away ill from INFLUENZA during the months of December 1889 and January 1890.

Grade.	Number of Men employed (about).	Number of Men attacked by Influenza.	Per-centage.	Remarks.
Clerks, General Offices -	230	51	22·2	
Clerks, Passenger Department -	1,480	50	3·4	
Clerks, Goods Department -	1,040	40	3·8	
Total Clerks - - -	2,750	141	5·1	
Porters - - -	2,700	100	3·7	} Passenger Department only.
Guards - - -	500	31	6·2	
Ticket Collectors - - -	150	5	3·3	
Policemen - - -	300	3	1·0	
Inspectors - - -	190	6	3·2	
Enginemen and Firemen -	3,063	131	4·2	
Total of these classes -	9,653	417	4·2	

STATEMENT showing the NUMBER of ENGINEMEN and FIREMEN away ill for the under-mentioned Period; and also the NUMBER suffering from INFLUENZA.

Number of Enginemen and Firemen.	Total Number away any part of the Fortnight through Illness.								
	Fortnight ended								
	Dec. 14, 1889.	Dec. 28, 1889.	Jan. 11, 1890.	Jan. 25, 1890.	Feb. 8, 1890.	Feb. 22, 1890.	Mar. 8, 1890.	Mar. 22, 1890.	April 5, 1890.
3,063	112	113	167	202	270	300	228	166	118
Per cent. absent	3·65	3·68	5·45	6·59	8·81	9·79	7·44	5·41	3·85
Number certified to be suffering from Influenza -	3	5	30	55	76	99	72	40	21

This table shows that at the height of the epidemic the number of enginemen and firemen absent from duty through illness was nearly three times as great as before it began or after its close. Of the absentees, however, only about one-half of the excess were certified as suffering from Influenza. This bears out this view, that the epidemic actually caused a great deal more illness than was directly ascribed to it.

LONDON AND NORTH-WESTERN RAILWAY.

Mr. Findlay, general manager, sends me a statement showing the number of salaried and wages staff of all grades, and the number in each grade disabled by Influenza between December 1st 1889, and January 31st 1890. By his permission, I give the following summary showing the per-centage attacked by Influenza in each department, and in certain grades in each department noteworthy for their number, the circumstances of their employment, or the proportion in which they have been attacked.

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London and
North-Western
Railway.

STATEMENT showing the NUMBER of SALARIED and WAGES STAFF in each GRADE disabled by INFLUENZA between the 1st December 1889 and the 31st January 1890.

Grade.	Total Number in the Service, on 1st Jan. 1890.	Total Number in each Grade disabled by Influenza between the 1st Dec. 1889 and 31st Jan. 1890, both dates inclusive.	Per-cent. attacked.
SUMMARY.			
Traffic Department - -	23,796	1,571	6.6
Telegraph „ - -	531	30	5.6
Secretary's, Chief Accountant's, Audit, &c. Departments - - -	493	117	23.8
Engineering, Permanent Way, Signal, Estate, &c. Departments - -	12,015	545	4.5
Locomotive Coach Department - - -	16,198	771	4.75
Carriage Department - -	3,706	650	17.6
Wagon Department - -	1,655	61	3.7
Steamboat Department* - -	586	1	0.2
Hotel Department - -	751	104	13.8
Grand total - - -	59,731	3,850	= 6.45 per cent.

J. WHITTLE,
Chief Accountant.

Expenditure Office,
25th March 1890.

* A note by the Head of the Steamboat Department stated that the reason for the small number of cases in this department was that the Influenza epidemic had only just reached Holyhead at the end of January 1890. At my request, I was furnished with another return showing the cases in that department up to the end of March, as follows:—

Number of Staff.	Cases of Influenza in			Total.	Per-cent. attacked.
	January.	February.	March.		
586	1	29	5	35	6.0

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	Grade.	Total Number in Service.	Disabled by Influenza.	Per- centage.
<i>Traffic Department.</i>				
	Clerks	4,243	486	11·5
	Other office staff	946	45	4·7
	Porters, inspectors, shunters, &c.	8,568	504	5·9
	Ticket collectors	192	14	7·3
	Guards	484	48	9·9
	Breaksmen	1,366	88	6·4
	Signalmen and pointsmen	2,744	88	3·2
	Carmen	2,864	174	6·1
	Various grades in goods department	2,178	83	3·8
	Policemen and detectives	127	11	8·7
	Lancaster canal staff	60	—	—
<i>Telegraph Department.</i>				
	Clerks	269	22	8·2
	Linemen, messengers, labourers, &c.	262	8	3·1
<i>Secretary's, &c. Departments.</i>				
	Clerks	387	101	26·1
	Other grades	106	16	15·1
<i>Engineering, Permanent Way, &c. Departments.</i>				
	Clerks	274	26	9·5
	Other office staff	140	19	13·6
	Platelayers, gangers, and labourers	8,623	374	4·3
	Other grades of artizans	2,978	127	4·2
<i>Locomotive Department.</i>				
Chiefly located at Crewe.	Clerks	372	8	2·15
	Other office staff	28	—	—
	Apprentices and boys	1,188	65	5·5
	Boiler-makers	659	24	3·6
	Fitters	1,529	108	7·1
	Forgemen and furnacemen	389	—	—
	Labourers	1,911	65	3·4
	Machinists, &c.	385	17	4·4
	Moulders	276	2	0·7
	Painters and plumbers	139	5	3·3
Travelling	Smiths and strikers	578	20	3·5
	Turners	221	16	7·2
Engine-drivers and firemen	Engine-drivers and firemen	4,873	230	4·7
	Inspectors and foremen	194	9	4·6
Variously located.	Cleaners	2,344	166	7·2
	Fuelmen	207	11	5·3
	Joiners	232	6	2·6
	Gasfitters	109	—	—
	Various other grades	530	19	3·6
At Garston Dock.—Dredgers		25	—	—
<i>Carriage Department.</i>				
Located chiefly at Wolverton.	Clerks	24	6	25·0
	Other office staff	3	—	—
	Apprentices and boys	38	2	5·3
	Carpenters and joiners	214	29	13·6
	Coach-makers	363	69	19·4
	Finishers and trimmers	276	47	17·0
	Fitters	413	83	20·0
	Labourers	468	109	23·4
	Moulders	55	7	12·8
	Painters and plumbers	329	81	24·6
Smiths and strikers	Smiths and strikers	241	40	16·5
	Other grades	145	20	13·8

Grade.		Total Number in Service.	Disabled by Influenza.	Per-centage.
Travelling.—Inspectors and foremen - -		60	8	13·3
Variously located.	{ Cleaners - -	536	91	17·0
	{ Various other grades - -	400	36	9·0
<i>Waggon Department.</i>				
Chiefly located at Earlstown.	{ Clerks and office staff - -	18	—	—
	{ Apprentices and boys - -	153	4	2·6
	{ Carpenters and joiners - -	344	11	3·2
	{ Labourers - -	203	7	3·4
	{ Moulders - -	25	—	—
	{ Forgemen and furnacemen - -	16	—	—
	{ Painters and plumbers - -	60	—	—
	{ Smiths and strikers - -	240	9	3·8
Variously located.	{ Greasers - -	98	10	10·2
	{ Lifters - -	104	8	7·7
	{ Other grades - -	191	8	4·2
Travelling.—Inspectors and foremen - -		46	1	2·2
<i>Steamboat Department (to March 31st).</i>				
At Holyhead.—Clerks, &c. - -		7	1	14·2
Travel-ling.	{ Officers - -	67	5	7·5
	{ Seamen - -	122	6	4·9
	{ Enginemen and stokers - -	120	8	8·7
	{ Stewards and cooks - -	56	2	3·6
Chiefly at Holyhead.	{ Mechanics, &c. - -	164	12	7·4
	{ Boatmen, porters, &c. - -	50	1	2·0

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It will be observed that in six out of the nine departments, viz., the Traffic, Telegraph, Secretary's, Engineering, Carriage, and Steamboat Departments, the per-centage of cases was highest among the clerks and office staff. In the Hotel Department all the staff are practically indoor. In the Waggon Department the number of clerks is small. In the Locomotive Department the clerks are chiefly located at Crewe, which was less severely attacked than London and the southern parts of the system, at any rate up to the end of January.

The location of the different departments has evidently influenced largely the proportion in which they have been affected. Thus the Secretary's Department, having its head-quarters in London, and the Carriage Department at Wolverton, Buckinghamshire, suffered severely, while the locomotive works at Crewe, and the waggon works at Earlstown, were comparatively lightly affected. Among the grades chiefly located at Wolverton, the per-centage of cases was 19·3, at Crewe 4·3, and at Earlstown 2·8. Among the grades in the locomotive, carriage, and waggon departments located at different stations on the line or travelling, the proportions were more nearly equal, viz., 13·6, 5·9, and 6·2 respectively. Probably if the returns for Crewe and Earlstown had been brought down to a later date than January 31st the numbers would have been larger, as we see was the case in the Steamboat Department.

GREAT NORTHERN RAILWAY.

Mr. Oakley, general manager, gives me tables of the number of staff employed in the several departments of the line south of and including Hatfield, and the number of cases of Influenza among them, which I have condensed as follows:—

Great Northern Railway.

On Epidemic
Influenza in
1889-90; by
Dr. Parsons.

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Grade.	Number em- ployed.	Number sick.	Per- centage.	Total days absent.
<i>Traffic Department.</i>				
Clerks in charge - - - -	20	Nil.	Nil.	Nil.
Clerks - - - - -	82	14	17·0	110
Inspectors, porters, shunters, &c. - - - -	309	21	8·8	144
Signalmen - - - - -	136	17	12·4	168
Guards and brakesmen - - - - -	157	3	2·0	18
Ticket collectors - - - - -	56	9	16·0	61
Lads - - - - -	75	2	2·7	7
Carriage cleaners - - - - -	92	Nil.	Nil.	Nil.
Lampmen - - - - -	48	1	2·1	4
Carmen and horsekeepers - - - - -	78	6	7·7	3
Total - - - - -	1,053	73	7·0	515
<i>Goods Department.</i>				
Clerks in charge - - - - -	22	4	18·2	22
Canvassers and collectors - - - - -	39	8	20·5	35
Clerks - - - - -	417	74	17·8	327
Inspectors, porters, shunters, &c. - - - -	574	76	13·2	636
Lads - - - - -	74	8	10·8	56
Carmen and horsekeepers - - - - -	489	70	14·3	605
Van guards - - - - -	400	26	6·5	197
Total - - - - -	2,015	266	11·8	1,878
<i>Engineer's Department.</i>				
Draughtsmen, &c. - - - - -	48	12	25·0	
Clerks - - - - -	25	6	24·0	
Carpenters and sawyers - - - - -	48	8	16·7	
Bricklayers and masons - - - - -	24	3	12·5	
Platelayers and labourers - - - - -	474	59	12·5	
Painters and plumbers - - - - -	44	4	9·0	
Gasfitters - - - - -	22	4	18·2	
Smiths, fitters, signal fitters, &c. - - - -	144	18	12·5	
Telegraph department - - - - -	34	9	26·5	
Total - - - - -	863	123	14·2	
<i>Locomotive Department.</i>				
Drivers and firemen - - - - -	302	39	12·9	
Cleaners - - - - -	154	32	20·8	
Mechanics - - - - -	258	41	15·9	
Labourers - - - - -	122	33	27·0	
Carriage examiners - - - - -	46	6	12·1	
Total - - - - -	882	151	17·0	
Grand total - - - - -	4,813	613	12·8	

The above figures agree with those already given for the London and North-Western Railway, in showing that in each department clerks and others employed indoors, many together, suffered above the average.

Certain grades brought much in relation with the public, as ticket collectors and canvassers, also suffered in large proportion. Cleaners in the locomotive department, who work at night, suffered in high proportion in both. Plumbers and painters, who suffered in high proportion on the North-Western, did not on the Great Northern, while gasfitters, who escaped on the former, were, relatively, numerous affected on the latter. Lampmen numerous affected on the North-Western, escaped lightly on the Great Northern. The total proportion affected on the Great Northern was twice as great as that on the North-Western, and three times that on the Great Western, but the excess seems to be accounted for by the circumstance that the Great Northern figures include February, and that they embrace only the London district, which we know from other sources, *e.g.*, the Army returns, suffered much more severely from the epidemic, as well as earlier, than the west and north of England. The following table gives the figures for the locomotive department only over the whole of the Great Northern system; it illustrates the progressive diminution of the epidemic as we proceed northwards from London, where it was at its maximum, to Leeds, Bradford, and York, where it was nil. It will be observed that the different proportions in which the several grades are located in different sections of the line cause the per-centages attacked by Influenza in this table to differ from those in the preceding one, which refers only to the London district. Thus in the second table, mechanics, who are located principally at Doncaster, where the epidemic was mild, have a lower rate than engine-drivers, who are most numerous in the London and Peterborough districts, where it was severe, whereas in the first table the proportions are reversed.

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GREAT NORTHERN RAILWAY.—LOCOMOTIVE DEPARTMENT.

RETURN of men who have been disabled from following their employment through suffering from Influenza for eight weeks during January and February 1890.

District.	Number of Members.	Number off Duty.	Drivers and Firemen.		Cleaners.		Mechanics.		Labourers.		Carriage Examiners.		Per-centage off duty in each district.
			No.	Off.	No.	Off.	No.	Off.	No.	Off.	No.	Off.	
Doncaster	2,652	89	198	7	115	7	1,707	47	598	28	34	Nil.	3.3
York	45	Nil.	22	Nil.	10	Nil.	2	Nil.	5	Nil.	6	Nil.	Nil.
Lincoln	99	10	48	8	26	2	8	Nil.	5	Nil.	12	Nil.	10.1
Grantham	135	4	54	1	43	1	15	1	11	1	12	Nil.	3.0
Retford	66	2	29	Nil.	13	1	8	1	3	Nil.	13	Nil.	3.0
Boston	96	10	31	4	17	1	34	1	11	4	3	Nil.	10.2
Leeds	336	Nil.	172	Nil.	81	Nil.	22	Nil.	47	Nil.	14	Nil.	Nil.
Leicester	39	1	20	1	10	Nil.	3	Nil.	3	Nil.	3	Nil.	2.5
Bradford	280	Nil.	146	Nil.	64	Nil.	44	Nil.	15	Nil.	11	Nil.	Nil.
Colwick (Nottingham).	404	41	181	21	90	13	62	2	42	5	29	Nil.	10.1
London	882	151	302	39	154	32	258	41	122	33	46	6	17.0
Peterboro'	720	65	305	27	84	13	198	17	99	8	34	Nil.	9.0
Totals	5,754	373	1,508	108	707	70	2,361	110	961	79	217	6	—
Per-centage disabled.	—	6.5	—	7.2	—	9.9	—	4.9	—	8.2	—	2.8	6.5

NOTE.—No cases of Influenza were reported before 27th December 1889.

General Manager's Department.

GREAT EASTERN RAILWAY.

Mr. Birt, general manager, gives me the following figures relating to the staff on that line:—

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Influenza in
1889-90; by
Dr. Parsons.

CHAP. VIII.
Great Eastern
Railway.

Grade.	Number.	Affected with Influenza.	Per-centage.
<i>I.—Indoor Staff coming in contact with Passengers.</i>			
Clerks, chiefly booking clerks - - -	867	151	17·4
Watercloset attendants - - -	59	4	6·8
Total - - -	926	155	17·0
<i>II.—Outdoor Staff coming in contact with Passengers.</i>			
Station-masters and inspectors - - -	452	64	14·2
Porters - - -	1,358	351	25·8
Passenger train guards - - -	389	69	17·8
Ticket collectors - - -	256	56	21·8
Miscellaneous - - -	55	4	7·3
Total - - -	2,510	544	21·7
<i>III.—Indoor Staff not, or rarely, coming in contact with Passengers.</i>			
Clerks (other than booking clerks) - - -	1,337	219	17·8
Artizans - - -	117	14	13·1
Gatemen - - -	254	28	11·0
Stablemen - - -	73	15	20·6
Foremen of works, &c. - - -	86	10	11·6
Signalmen - - -	1,044	112	10·7
Total - - -	2,911	398	13·6
<i>IV.—Outdoor Staff not, or rarely, coming in contact with Passengers.</i>			
Permanent-way inspectors and foremen "	47	4	8·5
Mechanics - - -	312	39	12·5
Platelayers - - -	3,195	309	9·7
Labourers - - -	476	18	3·8
Engine-drivers and firemen - - -	1,426	119	7·6
Goods guards - - -	245	48	19·6
Goods porters - - -	1,479	240	16·2
Shunters - - -	604	103	17·0
Carmen - - -	969	116	12·0
Miscellaneous - - -	161	12	7·4
Total - - -	8,914	1,008	11·2
Grand total - - -	15,261	2,105	13·8

The per-centage of cases of Influenza among the staff of the Great Eastern was higher than that on the other lines of which I have figures. This is no doubt due to the circumstance that the ramifications of the system are confined to the London district and the east of England, which were severely affected by the epidemic. Of the different grades porters in the passenger department were most numerous

attacked. Of the staff coming in contact with passengers, the out-door grades suffered in larger proportion than the indoor grades, but among the staff not coming in contact with passengers the proportions were reversed.

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Mr. Birt states that there are not many instances of a number of men being employed together in one room, except the clerks in the general offices, who work in numbers from 6 to 40 in one room, whereas the booking clerks are scattered at the various stations on the line. The proportion of cases among the two classes of clerks was nearly equal. Taken generally over the whole line the rank and file associate together at meals and other times in the rooms provided for guards, porters, and other similar classes of staff.

Mr. Birt was unable to give me any statistics specially relating to the staff employed on the Continental traffic, but it was not noticed that the stewards on board the steamboats plying to the Continent suffered more from the epidemic than others.

LONDON, BRIGHTON, AND SOUTH COAST RAILWAY.

Mr. Sarle, secretary and general manager, was unable to give me any figures as to the number of cases of Influenza among the staff of that line, but says that there is no doubt that the epidemic did prevail extensively among them. He gives me the appended table, showing the amount of sickness from all causes among drivers and firemen and among other employés (fitters, mechanics, labourers, &c.) in the locomotive and carriage department in corresponding periods of 1888-9 and 1889-90. It will be observed that in the latter period there was a considerable excess of sickness, which in all probability may be ascribed to the Influenza epidemic.

London and
Brighton Rail-
way.

Per-centage off ill.	Drivers and Firemen.	Other Employés.
December 1st, 1889, to February 1st, 1890 -	29·8	69·5
December 1st, 1888, to February 1st, 1889 -	10·7	43·0
Excess in 1889-90 -	19·1	26·5
Proportion of excess to sickness in 1 -	180 per cent.	62 per cent.

The excess, though actually greater among the mechanics, &c., was greatest in proportion to the amount of sickness in the previous year among the engine-drivers. The high amount of sickness in 1888-9 among the employés at the Brighton works, where most of the hands are employed, seems to show that something abnormal existed in that year, and renders it difficult to institute a comparison as to the relative effect of the epidemic upon the two classes of workpeople. The hands at Brighton are employed in large shops or engine sheds.

Mr. Sarle says: "In the traffic department men and youths were absent at almost every one of our 200 stations, but I may state that very few clerks, or those having indoor duties, were absent from their posts, showing that those most exposed to the weather were those most affected; these included station-masters, guards, signalmen, shunters, ticket collectors, carmen, policemen, porters, &c."

The epidemic seemed to be at its height in the week ending January 17th, 1890, when of the staff in the traffic department, numbering 5,046 in all, 290 were absent from duty through sickness, as against 81 during the corresponding period in 1889; the per-centage being 5·9 and 1·6 respectively.

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CHAP. VIII.

LOCOMOTIVE AND CARRIAGE DEPARTMENT.

STATEMENT showing the NUMBER of MEN off DUTY through SICKNESS from December 1st, 1889, to February 1st, 1890, compared with the corresponding Period of the previous Year.

Station.	Drivers and Firemen.						Other Employés.						Total Hands employed.					
	December 1st, 1888, to February 1st, 1889.			December 1st, 1889, to February 1st, 1890.			December 1st, 1888, to February 1st, 1889.			December 1st, 1889, to February 1st, 1890.			December 1st, 1888, to February 1st, 1889.			December 1st, 1889, to February 1st, 1890.		
	Total No.	No. off ill.	Per-centage off ill.	Total No.	No. off ill.	Per-centage off ill.	Total No.	No. off ill.	Per-centage off ill.	Total No.	No. off ill.	Per-centage off ill.	Total No.	No. off ill.	Per-centage off ill.	Total No.	No. off ill.	Per-centage off ill.
Brighton -	133	8	6.0	149	47	31.5	1,620	946	58.4	1,665	1,518	91.2	1,753	954	54.4	1,814	1,565	86.3
New Cross -	175	26	14.9	188	58	30.8	294	49	16.7	295	61	20.7	469	75	16.0	483	119	24.6
Battersea -	211	24	11.4	227	67	29.5	241	15	6.2	254	78	30.7	452	39	8.6	481	145	30.1
Kingston, Dept- ford, and Willow Walk -	-	-	-	-	-	-	24	2	8.3	27	4	14.8	24	2	8.3	27	4	14.8
Horsham -	38	6	15.8	37	8	21.6	31	2	6.4	32	5	15.6	69	8	11.6	69	13	18.8
Portsmouth -	24	1	4.2	22	2	9.1	30	2	6.7	29	1	3.4	54	3	5.6	51	3	5.9
Newhaven -	13	-	-	13	4	30.8	80	7	8.7	87	23	26.4	93	7	7.5	100	27	27.0
Eastbourne -	29	5	17.2	31	13	41.9	25	1	4.0	27	8	29.6	54	6	11.1	58	21	36.2
Tunbridge Wells -	24	2	8.3	25	8	32.0	18	2	11.1	18	7	38.9	42	4	9.5	43	15	34.9
Three Bridges -	11	-	-	10	2	20.0	16	1	6.2	15	5	33.3	27	1	3.7	25	7	28.0
Hastings -	16	-	-	16	5	31.2	15	2	13.3	15	2	13.3	31	2	6.4	31	7	22.6
Totals -	674	72	10.7	718	214	29.8	2,394	1,029	43.0	2,464	1,712	69.5	3,068	1,101	35.9	3,182	1,926	60.5
Increase in 1889-90 over 1888-9 -	-	-	-	44	142	19.1	-	-	-	70	683	26.5	-	-	-	114	825	24.6

MIDLAND RAILWAY.

Mr. Noble, general manager, was unable to give me any information, except that the number of drivers and stokers who were off duty from Influenza during the week ending January 16th, 1890, was only 35 out a total of 3,897, or not quite 1 per cent.

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CHAP. VIII. Midland Railway.

LONDON and SOUTH-WESTERN RAILWAY.

Mr. Scotter, general manager, states, that a larger number than usual of that company's servants have been absent from duty through sickness, but has no means of telling what proportion has been disabled through Influenza, and cannot therefore give any reliable statistics.

London and South-Western Railway.

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Year	Boys	Girls	Influenza (under seven years old)	Total
1889	202	212	42	456
1890	200	210	40	450

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IX.—BEHAVIOUR OF THE EPIDEMIC IN PUBLIC INSTITUTIONS.

CHAP. IX.
Influenza in
public institu-
tions.

The following reports illustrate the behaviour of the epidemic in various public institutions in which large numbers of inmates dwell under one roof, and in circumstances in which their movements can be better ascertained than in the case of the outside public. Except where the name of the writer is otherwise given, the reports are the result of inquiries made by myself on the spot with the assistance, in all cases readily given, of the medical officers and superintendents of the several establishments, to whom I here desire to express my acknowledgments.

OUTBREAK at the FOREST GATE DISTRICT SCHOOLS.

Forest Gate Dis-
trict Schools.

These schools receive pauper children of both sexes from the Poplar and Bethnal Green Unions. They are situated in a populous neighbourhood on the eastern outskirts of London, on a gravelly soil. The number of inmates in December last was as follows:—

Boys - - - - -	268
Girls - - - - -	213
Infants (under seven years old of both sexes) - - - - -	95
	<hr/>
	576
Resident staff - - - - -	50
	<hr/>

The occurrence of Influenza at these schools was inquired into especially on account of the exceptionally early date at which it was reported to have occurred. The medical officer, who is also Medical Officer of Health for a neighbouring district, in replying on January 27th to the Board's circular on the subject of Influenza, stated that he had himself suffered from the complaint, and afterwards that children at the schools were numerous attacked by it. The medical report book kept at the school records the general health of the school to have been very good week by week from November 7th to December 12th, with the exception of a few coughs and colds in the week ending November 21st. Under date December 19th occurs the entry, "There has been a severe epidemic amongst the children; over 100 have been treated by me during the past five days. The symptoms point to its being a visitation of the 'Influenza epidemic' now so prevalent all over Europe. The average duration of the symptoms was about 20 hours."

No records were kept of the number, or dates of the cases as a whole, as they were in general mild, and only two were removed to the infirmary. A book in which are entered the applications to the doctor

among the boys over seven years old, shows the following daily numbers entered as "unwell," which is stated to mean that they had Influenza :—

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Nov.	DECEMBER.										JAN.	TOTAL.
29.	9.	10.	11.	12.	13.	14.	18.	19.	21.	24.	9.	
1	1	2	5	9	2	3	1	1	2	1	1	29

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For the girls and infants no similar record is available, and the above does not even represent the whole of the cases among the boys, as there were many mild cases which did not come under the care of the doctor but were treated with simple remedies and rest in bed. There were also many cases among the children already in the infirmary under treatment for ophthalmia. It would seem that the epidemic, among the boys at least, was almost confined to the period December 9th-14th. The symptoms are described as having been violent frontal headache, pains in the eyes, limbs, and back, sickness and high temperature, reaching 102° F.

The first case is said to have been a boy aged 14 taken ill on November 29th; he had been an inmate for several years, and had not recently been outside the school. He was under treatment for ophthalmia at the time. No other case among the boys was recorded till December 9th. December 4th was visiting day for Poplar, when some 200-300 people came to visit the children. The cases of Influenza were at first thought to be stomach derangements due to indigestible viands brought to the children by visitors, or to something wrong with the milk supply.

Among the resident staff there was only one case of Influenza.

OUTBREAK OF INFLUENZA at the SOUTH METROPOLITAN DISTRICT SCHOOLS, SUTTON, SURREY.—Reported by G. RICE, M.B., Medical Officer.*

"On the 3rd January a laundrymaid was seized with severe frontal headache, pains in middle of back and in legs from the knees downwards, lachrymation with pain and suffusion of eyeballs, and nasal catarrh. A few hours after I first saw her a scarlatiniform rash appeared about her face, but disappeared by next morning. On inquiry I ascertained that a week before, on Christmas Day and the day following, the wife of the swineherd living on the place, and who sells sweets to the servants and children, had a severe catarrh, with pains in the body and extremities, but she had not gone to bed, and had carried on her business as usual.

at South Metro-
politan District
Schools;

On the 3rd January the senior boys began to complain of severe headache and tendency to sickness, and the daily number of new cases rose from 3 on this date to 36 on the 8th, declining from this point to 2 on the 20th.

On the 7th the girls were seized and the number of cases rose to 78 on the 8th. The junior boys began to be affected on the 8th and the

* A fuller account of this outbreak was given by Dr. Rice in a paper read before the Epidemiological Society on April 23rd, 1890, which is published in the "Transactions" of that Society.

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number of cases rose to 22 on the 15th. The infants began to be affected on the 11th, and on the 14th there were 38 fresh cases.

The senior and junior boys are in one building, but on separate sides; the infants are in another building, and the girls some distance away. On the senior side but one officer (a schoolmaster) was attacked, and he but very slightly, while on the junior side there were six, most of whom were much prostrated. Among the infants there were three dormitory maids, three teachers, and the pantry-man, while at the girls' school the male officers were the only ones attacked.

The infants when attacked were treated in one of their own dormitories. As I have said they were attacked on the 11th. On the 16th one of the dormitory maids attached to the ward, and who had been very assiduous in her attentions, was seized with very severe symptoms, the headache and prostration being much marked.

It is rather remarkable that practically none of the ordinary patients in the infirmary were attacked, and not a nurse laid up.

The number of senior boys affected was 141 out of a total of 500, or 28·2 per cent.; of junior boys 122 out of about 350, or 34·9 per cent.; of infants 125 out of about 400, or 31·2 per cent.; and of girls 227 out of about 600, or 37·8 per cent.

The dates of commencement of the cases are given in the table on page 207.

Very few of the children complained of bodily pain or had catarrh, but the prostration was marked, and the headache violent. The infants and junior boys and girls were nearly all violently sick at the outset, but the senior boys were not so much so. Those with high temperatures at the outset rallied quickly, but those between normal and 101° F. were slower in recovering. The average length of stay of those detained in the infirmary was about two days, and only three or four cases were detained longer through lung symptoms. The treatment in the case of the elder children was an emetic followed in a few hours by a saline purge. Those treated at the beginning with white mixture and salines did not rally so quickly as those treated with emetics. If headache were severe antipyrine was administered, and if pains, salicylate of soda. As soon as the other symptoms subsided quinine was given for a short time, but complete recovery was usually very rapid. There was no fatal case.

From what I have seen I believe the affection due to a microbe, from its method of spreading, but of a large number of children only a certain proportion appear to be attacked.

The animals on the farm here have been free from disease lately, but the veterinary inspector of the district informs me that "influenza" has been rife among horses (especially cart horses) the last three months, but of a mild character as compared with some other districts."

OUTBREAK at the ASYLUM for IMBECILES and SCHOOL for IMBECILE CHILDREN, DARENTH.

at Darenth
Asylum for
Imbeciles;

These two institutions, belonging to the Metropolitan Asylums Board, are situated two miles from Dartford, and 16 miles E.S.E. from London, in an elevated and exposed situation on a chalky soil. The two establishments are within one enclosure, and one or two hundred yards apart, but are under different management, and there is little, if any, inter-communication between them.

Class.	Number.	INFLUENZA CASES.—JANUARY														Total.							
		2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.		16.	17.	18.	19.	20.	21.	22.
Senior boys - -	500	—	3	1	2	14	34	38	23	12	5	—	—	—	3	—	4	—	—	2	—	—	141
Junior boys - -	350	—	—	—	—	—	—	6	15	10	6	4	7	16	22	11	10	6	4	3	1	1	122
Infants - - -	400	—	—	—	—	—	—	—	—	—	2	5	17	38	28	17	8	2	2	6	—	—	125
Girls (above 10 years)	600	—	—	—	—	—	10	78	31	18	17	39	8	14	4	1	3	2	1	—	1	—	227
Officers - - -		1	—	—	—	5	2	—	1	1	—	—	—	—	2	1	—	18	2	1	—	—	34
Totals - - -		1	3	1	2	19	46	122	70	41	30	48	32	68	59	30	25	28	9	12	2	1	649

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The asylum for adults, which is under the care of Dr. Dyer, contained at the time of the outbreak the following population :—

Patients	-	-	{	Males	-	-	495
			{	Females	-	-	610
							1,105
Subordinate staff	-	-	{	Males	-	-	37
			{	Females	-	-	69
Officers	-	-	-	-	-	-	9
							115
Total	-	-	-	-	-	-	1,220

The buildings consist of a number of ward-blocks of several storeys arranged parallel one to another, those for males and females being 60 yards apart, but the whole are connected by a long corridor, which runs transversely across the entire series from one side to the other.

The male and female patients do not associate together except on three occasions weekly, viz., at chapel on Sundays and Wednesdays, and at a dance on Friday evenings. On the former occasions the men sit on one side of the chapel, and the women on the other; and even at the dance the two sexes do not mix much together, the dancing being confined to a few couples. The patients from different wards do not meet together at meals, as meals are served in the wards.

Of the males about two thirds work more or less in the open air, but the women are less out of doors.

The cases of Influenza of sufficient severity to require confinement to bed have numbered 127, distributed as follows :—

				Cases.	Per-centage attacked.			
Patients	-	-	{	Males	-	-	40	8·1
			{	Females	-	-	62	10·1
Staff	-	-	{	Males	-	-	15	35·0
			{	Females	-	-	10	14·3
							127	10·4

These different classes of residents were not affected at the same time; the attendants were first to be affected; a fortnight later the male patients, and again, a fortnight later, the women patients. The following calendar shows the number of cases day by day :—

Date.	Meetings.	INFLUENZA CASES.				Total.	On Epidemic Influenza in 1889-90; by Dr. Parsons. CHAP. IX.
		Patients.		Staff.			
		Males.	Females.	Males.	Females.		
January 3	Dance - - -	—	—	1	—	1	
" 4	—	—	—	—	1	1	
" 5	Chapel - - -	—	—	—	—	—	
" 6	—	—	—	—	—	—	
" 7	—	—	—	1	—	1	
" 8	Chapel - - -	—	—	2	—	2	
" 9	—	—	—	1	—	1	
" 10	Dance - - -	—	—	1	—	1	
" 11	—	—	—	—	—	—	
" 12	Chapel - - -	—	—	—	—	—	
" 13	—	—	—	—	—	—	
" 14	—	1	—	—	1	2	
" 15	Chapel - - -	—	—	—	—	—	
" 16	—	—	—	—	1	1	
" 17	Dance - - -	—	—	2	—	2	
" 18	—	7	—	1	—	8	
" 19	Men not at chapel	1	—	1	—	2	
" 20	—	2	—	2	—	4	
" 21	—	7	—	1	—	8	
" 22	Men not at chapel	5	—	1	—	6	
" 23	—	4	—	—	—	4	
" 24	No dance - - -	1	—	—	—	1	
" 25	—	—	—	—	—	—	
" 26	Men not at chapel	—	—	—	—	—	
" 27	—	—	—	1	1	2	
" 28	—	3	—	—	—	3	
" 29	Men not at chapel	1	—	—	—	1	
" 30	—	2	—	—	—	2	
" 31	No dance - - -	1	3	—	—	4	
February 1	—	—	1	—	—	1	
" 2	Men not at chapel	4	1	—	1	6	
" 3	—	1	1	—	—	2	
" 4	—	—	1	—	—	1	
" 5	Chapel - - -	—	3	—	—	3	
" 6	—	—	—	—	—	—	
" 7	No dance - - -	—	7	—	2	9	
" 8	—	—	7	—	—	7	
" 9	Chapel - - -	—	3	—	—	3	
" 10	—	—	8	—	—	8	
" 11	—	—	8	—	—	8	

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Date.	Meetings.	INFLUENZA CASES.				Total.
		Patients.		Staff.		
		Males.	Females.	Males.	Females.	
February 12	Chapel - - -	—	2	—	—	2
„ 13	—	—	5	—	—	5
„ 14	Dance - - -	—	2	—	—	2
„ 15	—	—	6	—	—	6
„ 16	Chapel - - -	—	2	—	—	2
„ 17	—	—	—	—	—	—
„ 18	—	—	—	—	—	—
„ 19	Chapel - - -	—	—	—	—	—
„ 20	—	—	—	—	—	—
„ 21	Dance - - -	—	—	—	—	—
„ 22	—	—	1	—	—	1
„ 23	Chapel - - -	—	1	—	1	2
Exact dates not ascertained		—	—	—	2	2
	Total	40	62	15	10	127

The male attendants mostly live on the premises, but are allowed to go out from 8 to 10 every evening. The female attendants all live on the premises; they are allowed out four evenings a week, a whole day once a month, and a half-day every week. The patients had not been outside the asylum grounds since the beginning of January. These attendants had therefore more opportunity of coming in contact with infection than the patients; and this may account for their having been earlier attacked. Influenza had been previously prevalent in the neighbourhood; at Greenhithe it is reported to have commenced in the middle of December. The City of London Asylum, which is near those of the Asylums Board, is said to have been affected a week earlier.

The male attendant who was taken ill on January 3rd went home and did not return. The male attendant ill on January 7th returned to duty on January 19th, and one of those ill on January 8th on January 14th. The other case on January 8th and that on January 9th were among the general staff. The attendant ill on January 10th did not return to duty till March 25th. The male patient ill on January 14th was removed at once to the infirmary. The seven patients ill on January 18th were in different wards, and had not been associated in their work.

The Influenza among the patients being at first confined to the males, Dr. Dyer thought it advisable, in the hope of preventing its extension to the females, to stop opportunities of meeting of the two sexes, and from January 18th the weekly dance was discontinued, and the men ceased to attend chapel. It may have been through this measure that the women patients escaped for about a fortnight, but eventually the Influenza by some means got established among them, and it was then considered useless to maintain the separation.

On the female side the attendant attacked on January 4th returned on January 9th; the one on January 14th on January 20th; the one on January 16th on January 27th; and the one on January 27th on

February 2nd. I am not able to connect the outbreak among the women with the return of either of these attendants to duty while in an infectious state.

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Of the three women who were taken ill on January 31st two were in one ward, and the other was a helper who went about from ward to ward, and may have been there too. No attendant in that ward is known to have suffered.

The class of patients most attacked were those between 20 and 35 years old, and actively employed. Of 20 who attended on the sick only three, or 15 per cent., were attacked. Of the farm boys, who are most exposed to the air, four out of 30 were attacked, and of 15 patients habitually confined to their beds two were attacked, an identical proportion. No one block of buildings was specially attacked. One block escaped, it contained about 40 comparatively healthy old men, able to walk about, but not at work.

Of symptoms muscular pains were the most prominent in the younger patients, but the older ones suffered most from chest complications. Six cases proved fatal through broncho-pneumonia. It was noticed that all persons with chest affections were worse at the time when the Influenza was prevalent, although not actually suffering from it themselves.

The Darenth Schools for imbecile children, under the care of Dr. Fletcher Beach, consist of a series of ward blocks connected by a corridor, and also of several detached one-storey buildings termed "pavilions," each of which consists of an octagonal day-room with bedrooms radiating from it.

in Darenth
Schools for
Imbecile
Children;

The number of inmates in January 1890, and of cases of Influenza among them, was as follows:—

—				Number.	Influenza Cases.	Per-centage attacked.
Children	Boys	-	-	393	54	13·7
		-	-	257	21	8·2
	Both sexes	-	-	650	75	11·5
Staff (resident)	-	-	-	83	25	30·1

Classifying the patients according to their capacities, the numbers are as follows:—

—				Number.	Influenza cases.	Per-centage.
Workers	Males	-	-	25	14	56·0
		-	-	37	11	29·7
	Both sexes	-	-	62	25	40·2
School children	Males	-	-	226	25	11·0
		-	-	105	10	9·5
	Both sexes	-	-	331	35	10·6
Helpless	Males	-	-	142	15	10·6
		-	-	115	—	—
	Both sexes	-	-	257	15	5·8

The boys and girls meet at school and in chapel, but not at meals.

The following are the dates of commencement of the several cases:—

	Boys.	Girls.	Attendants.	Total.
January 6th - -	—	1	—	1
„ 8th - -	1	—	—	1
„ 9th - -	1	—	—	1
„ 10th - -	2	—	2	4
„ 11th - -	1	4	1	6
„ 12th - -	—	2	—	2
„ 13th - -	6	1	1	8
„ 14th - -	3	4	2	9
„ 15th - -	6	3	3	12
„ 16th - -	2	1	1	4
„ 17th - -	8	3	4	15
„ 18th - -	4	1	1	6
„ 19th - -	2	—	—	2
„ 20th - -	4	—	1	5
„ 21st - -	—	—	3	3
„ 22nd - -	3	—	—	3
„ 23rd - -	3	—	—	3
„ 24th - -	2	—	—	2
„ 25th - -	1	—	3	4
„ 27th - -	4	—	2	6
„ 28th - -	1	—	—	1
„ 30th - -	—	—	1	1
February 14th - -	—	1	—	1
	54	21	25	100

I am indebted to Dr. Fletcher Beach for the following account of the incidence of the disease upon the several ward blocks.

A. Reception block, containing both boys and girls.

January 12th - 1 girl, worker
 „ 15th - 1 boy, not a worker } total, 2; 1 boy, 1 girl.

The nurse took the disease on January 30th.

B. Little boys' epileptic block.—Most of these patients attend school, but a dozen or so are helpless as well as epileptic.

January 9th - - - 1 boy
 „ 10th - - - 1 „
 „ 17th - - - 2 boys } total, 6 boys.
 „ 25th - - - 1 boy
 „ 28th - - - 1 „

A male attendant took the disease on January 25th.

C. Helpless boys' block.

January 22nd - - - 3 boys
 „ 23rd - - - 1 boy } total, 6 boys.
 „ 24th - - - 2 boys

A male attendant took the disease on January 18th, and a female attendant on January 17th.

- D. Big boys' epileptic block.—No cases among patients or attendants.
- E. Boys' Infirmary, containing a large number of helpless cases.—No cases among patients or attendants.

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F. Healthy boys' block.—Children attending school.

January 13th	-	-	-	1 boy	} total, 6 boys.
„ 15th	-	-	-	1 „	
„ 17th	-	-	-	1 „	
„ 18th	-	-	-	3 boys	

Attendants not affected.

G. Healthy boys' block.—Children attend school, and some work in other blocks.

January 13th	-	-	-	2 boys	} total, 5 boys.
„ 15th	-	-	-	1 boy	
„ 16th	-	-	-	1 „	
„ 17th	-	-	-	1 „	

Attendants not affected.

H. Healthy little boys' block.—Children attend school.

January 13th	-	-	-	3 boys	} total, 10 boys.
„ 14th	-	-	-	1 boy	
„ 15th	-	-	-	2 boys	
„ 17th	-	-	-	3 „	
„ 20th	-	-	-	1 boy	

Attendants not affected.

S. Pavilion.—Working male patients, and a few attending school.

January 15th	-	-	-	1 boy	} total, 13 boys.
„ 18th	-	-	-	1 „	
„ 19th	-	-	-	2 boys	
„ 20th	-	-	-	3 „	
„ 23rd	-	-	-	2 „	
„ 27th	-	-	-	4 „	

A male attendant took the disease on January 27th.

T. Pavilion.—School children and helpless patients, the latter being the majority.

January 14th	-	-	-	2 boys	} total, 4 boys.
„ 16th	-	-	-	1 boy	
„ 17th	-	-	-	1 „	

A male attendant took the disease on January 17th.

O. block.—Infectious infirmary, at present occupied by helpless boys and girls.

January 8th	-	-	-	1 boy	} total, 3 boys.
„ 10th	-	-	-	1 „	
„ 11th	-	-	-	1 „	

Attendants not affected.

I. block.—Healthy girls attending school.

January 6th	-	-	-	1 girl	} total, five girls.
„ 11th	-	-	-	3 girls	
„ 15th	-	-	-	1 girl	

A female attendant was ill on January 11th, and another on January 14th.

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N. block.—Working female patients.

January 14th	-	-	-	2 girls	} total, 7 girls.
„ 15th	-	-	-	2 „	
„ 17th	-	-	-	2 „	
February 14th	-	-	-	1 girl	

Attendants not affected.

K. Girls' Infirmary,—containing chiefly helpless patients.

January 14th - - - 1 girl.

This was a working patient who lived there. Attendants not affected; but a school monitress living there was ill on January 14th.

J. Healthy girls' block,—containing children attending schools. Neither patients nor attendants were affected.

L. block.—Girls' epileptic block,—contains a few workers, but the bulk of the patients are, in about equal shares, children attending school and helpless cases.

January 11th	-	-	-	1 girl, worker	} total, 4 girls.
„ 12th	-	-	-	1 girl	
„ 16th	-	-	-	1 girl	
„ 18th	-	-	-	1 girl, worker	

A female attendant took the disease on January 16th, and another on January 17th.

M. block.—Helpless girls' block.—A few only of the children attend school.

January 13th	-	-	-	1 girl	} total 3 girls.
„ 14th	-	-	-	1 „	
„ 17th	-	-	-	1 „	

A female attendant was affected on January 13th, another on January 16th, and another on January 17.

The two nurses in charge of the corridor, who had to visit by night the six blocks F., G., H., I., J., and N., were both taken ill on January 15th. The nine other members of the staff affected, were porters, workmen, and maid servants, not attendants on the patients. In the male wards there are both male and female attendants, who are married couples. In no case have both husband and wife been attacked.

Influenza as before mentioned was previously prevalent in the neighbourhood of Dartford, and the attendants when off duty often go there. As, however, the earliest recognised cases of Influenza were among the patients and not among the attendants (contrary to the experience of the other asylum), it is not possible to affirm that the disease was introduced by them.

January 3rd was visiting day, but the girl who was taken ill on January 6th had not received any visitors.

The disease took a milder form among the children than in the staff. There were no deaths. The cats and dogs kept in the wards were not affected.

EPIDEMIC on board of the "EXMOUTH" TRAINING SHIP.

on "Exmouth"
training ship;

This training ship, belonging to the Metropolitan Asylums Board, is stationed in the Thames, off Grays, Essex. The crew consists of 32 officers and 528 boys. The epidemic of Influenza is considered to have commenced on the afternoon of Thursday, January 2nd, though the cases occurring on that day seem to have been returned under the heading of dyspepsia (6 out of 11 admissions to infirmary on that day

being so returned). Here, as I have found to have happened elsewhere, the pressure of the epidemic interfered with the keeping of complete records of sickness, and between January 4th and 11th inclusive, in the daily returns of sick the nature of the disease is not entered.

The following are the numbers of admissions to the infirmary from all causes daily, from December 27th to January 4th :—

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	DECEMBER					JANUARY			
	27.	28.	29.	30.	31.	1.	2.	3.	4.
Diarrhœa - -	—	—	—	—	—	—	—	1	—
Dyspepsia - -	1	—	1	1	—	1	6	2	—
Eczema - -	1	—	1	—	—	—	1	—	—
Rheumatism - -	—	2	—	—	—	—	2	—	—
Sprain - -	—	—	—	1	—	—	—	—	—
Tonsillitis - -	—	—	—	—	—	2	—	—	—
Enlarged gland - -	—	—	—	—	—	1	—	—	—
Conjunctivitis - -	—	—	—	—	—	—	1	—	—
Gathered ear - -	—	—	—	—	—	—	1	—	—
Influenza - -	—	—	—	—	—	—	—	1	6
Not stated - -	—	—	—	—	—	—	—	8	38
Total - -	2	2	2	2	—	4	11	12	44

On January 5th the infirmary, which is an isolated building on shore, was full, and arrangements were therefore made for treating the Influenza cases on board on the lower (orlop) deck. The patients were, however, removed to the infirmary when well enough and when there was room for them there, and on January 12th they had all been removed.

The following were the daily numbers of new cases of sickness from January 3rd to January 13th, the day before my visit, all the cases treated on the orlop deck being reckoned as cases of Influenza :—

	JANUARY										
	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Influenza - - -	1	6	101	50	27	20	11	4	3	1	4
Other or unspecified cases	11	38	22	—	3	1	7	—	—	—	—
Total - - -	12	44	123	50	30	21	18	4	3	1	4

Doubtless there were many cases of Influenza on January 4th and 5th among those not so specified.

The only classification of the boys which is made is into starboard and port watches. These occupy opposite sides of the same decks and have similar duties to perform, but at alternate times. Both watches appear to have been affected by Influenza to a nearly equal extent. Influenza had been prevalent in Grays town before it occurred on the "Exmouth." Dr. Stirling, Medical Officer of Health for Grays, reports that Influenza first occurred on December 19th; at first, scattered cases,

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which were numerous by December 23rd, but on December 30th, or perhaps on the evening of December 29th, a sudden great increase occurred. There is of course frequent communication between the training ship and the shore.

About 300 boys were away on leave at Christmas, visiting their friends in London, returning about December 28th. Two of these had come back ill with rheumatism, from which complaint one of them had been under treatment before he went on leave. The captain states that no cases of illness like Influenza came under notice between return from leave and January 2nd; a special look-out, he says, is kept for boys who may be unwell after returning from leave, and the clothes of every boy who has been on leave are fumigated on his return to the ship. A boy admitted to the infirmary on January 1st, whose case is suspected to have been the first one of Influenza, had returned on December 28th from a visit to Southwark, where his mother had been ill, but the nature of her illness was not known.

The symptoms observed at the commencement of an attack were shivering, headache, backache, and drowsiness, and in a few cases vomiting. Catarrhal symptoms were slight or absent at the commencement of the attack, but later in the course of the illness there was severe cough. Several patients after getting up had relapses which were more severe than the primary attack, but all eventually recovered. The boys are said to be averse to reporting themselves sick, and continue to go about as long as they are able.

EPIDEMIC on board the TRAINING SHIP "SHAFTESBURY."

I learn from Dr. Male, of Grays, that there was at the same time an outbreak of Influenza on board the training ship "Shaftesbury," which is stationed at Grays, about a quarter of a mile east of the "Exmouth." The first appearance of the disease was on January 2nd. The following table shows the number of fresh cases each day:—

on "Shaftes-
bury" training
ship;

	JANUARY								
	2.	3.	4.	5.	6.	7.	8.	9.	10.
Boys affected -	20	10	33	47	35	27	19	7	6

making a total of 204 cases out of 395 boys on board at the time.

On January 1st a boy was admitted to the infirmary, which is on shore, suffering from "catarrh": this, Dr. Male thinks, was very probably the first case of Influenza. There is frequent communication between the ship and the shore, but this boy had not been on shore for a considerable time previous to his illness. The other patients in the infirmary did not take Influenza till a week or two after, when two or three cases occurred among them.

There was no circumstance, Dr. Male says, which could account for the outbreak. No boys had been away on leave. There was a conspicuous absence of any premonitory sneezing or running from the eyes, and there was no cough or symptom of catarrh afterwards. The first symptoms complained of were headache, "pains all over," and in many cases vomiting. The pulse rate was increased in most of the cases, and the temperature ranged from 99° to 101° F., in one case only reaching 102° F. The tongue was in most cases moist, with slight yellow streaky fur, in a few cases it was dry and red. Most of the boys were well in 24 hours; some in a shorter period, a few were confined to bed for several days. Some were probably malingering. No complications

whatever occurred, and all the boys made good recoveries. The officers all took the complaint after the boys.

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INFLUENZA on board the INDUSTRIAL TRAINING SHIP "MOUNT
EDGE CUMBE" at SALTASH, CORNWALL.

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The following account is taken from a communication by Mr. George Preston of Saltash, in the "British Medical Journal" of March 1st, 1890.

on "Mount
Edgecumbe"
training ship;

The first case of Influenza occurred on January 31st.

The number of cases on the ensuing days was as follows:—

Day	Jan. 31.	Feb. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Total.
Cases	1	—	6	8	16	16	16	10	4	7	—	1	85

making a total of 85 out of 196 boys or 43 per cent.

The ages of the boys range from 12 to 16. The onset was very sudden, and the attacks lasted from two to five days, the average being three days. Out of the 12 officers of the ship four were attacked with Influenza during the same time as the boys. In all the cases among the boys except 5 the severity of the pain was much less than among adults.

OUTBREAK at ST. MARY'S ORPHANAGE for ROMAN CATHOLIC BOYS,
NORTH HYDE, near SOUTHALL.

This institution contained on January 13th 601 boys of ages between 6 and 16 years, and 24 resident officers. Of these, 76 boys and 6 officers had suffered from Influenza. The dates of the attacks among the boys were as follows:—

at St. Mary's
Orphanage,
North Hyde;

	JANUARY							Total.
	2.	3.	4.	5.	6.	7.	8.	
New cases	1	16	35	10	7	6	1	76

The boys are classified according to the refectory in which they take their meals, as follows:—

Refectory.	Number of Boys.	Ages.	Influenza Cases.	Per-centage attacked.
Little boys	64	6 to 8 years	12	18·8
St. Nicholas	248	8 to 12 „	39	15·6
St. Edward	266	12 to 16 „	25	9·4
In infirmary	23	8 to 14 „	—	—
Total	601		76	12·6

A greater incidence upon the younger boys is thus shown.

Classified in other ways, as according to the playgrounds, dormitories, schoolrooms, and workshops in which they spend portions of their time, the boys fall into other groups which do not coincide with the above groups, or with each other, but overlap in a very complicated fashion.

There are 13 dormitories in use, and in all of them cases of Influenza occurred. The largest number (12 cases) was in the one (St. Nicholas) occupied by little boys ; this dormitory is in a separate block, and has a separate lavatory. Most of the dormitories are in a large block, and are connected one with another by passages and staircases, and one lavatory serves for two dormitories. Each boy has a separate towel.

In school the boys are classed into seven standards.

There are five schoolrooms, but the upper standards meet in one room, and the 4th and 5th standards are each divided into two portions, one half attending school in the morning, and the other in the afternoon, and in a room used in the morning by a different standard. The boys in the standards above the 3rd, and some of those in the 3rd, are employed during part of the day in workshops or in doing work about the premises, boys from several different standards meeting in one workshop. The boys meeting in one refectory also included those who in school were in several different standards, according to their proficiency in learning, though of course the younger boys were in general in the lower standards. There are two playgrounds, one for the boys of the St. Edward's refectory, the other common to the boys of the other two refectories.

It will be seen from what has been said that there is much inter-communication between the different sections of boys in the school, so that if a source of infection chanced to be present in the shape of a boy suffering from unrecognised disease its influence would not be confined to any one group of boys, but would be widely distributed over the school.

The earliest case of Influenza was suspected to have been that of a boy named Daniel McCarthy, aged 10, who was admitted to the Orphanage on January 1st from the St. Olave's Workhouse, Southwark. He had walked from the workhouse to Aldgate Station, and from Southall Station to the Orphanage ; it was a frosty day, and he had felt cold on the journey. There had been previous cases of Influenza both at Southwark and at Southall.

On January 2nd he was taken ill with headache and pain in limbs, and nausea, and perversion of taste ; he was ill three or four days, was very weak afterwards, but did not keep his bed. He went into St. Nicholas's refectory on his arrival, but next day was sent into the little boys' refectory as being warmer ; he was in the schoolroom occupied in the morning by the 3rd, and in the afternoon by part of the 4th standard, and slept in the St. George's dormitory.

On the afternoon of January 1st he was at a distribution of toys in another schoolroom used by parts of the 4th and 5th standards.

The epidemic commenced on Friday, January 3rd. Six boys were taken ill in the morning, and 16 altogether by night. Of these 15 had been in the same room with McCarthy, viz., either the schoolroom or one or other of the two refectories in which he had been. (The other boy may also have been ; he was employed in house-cleaning.)

On January 4th, 16 boys were taken ill in the morning, and 19 more in the afternoon ; after this the daily number of new cases rapidly diminished, the last being on January 8th.

Before January 1st there had been only slight coughs and colds in the Orphanage, not more numerous than usual at the time of year.

McCarthy was the only admission between December 27th and January 8th. There had been very few visitors to the Orphanage since Christmas ; none were present at the distribution of toys on January 1st.

Of the resident staff one suffered on January 3rd and another on January 4th.

In the infirmary, which is a detached building in the grounds, a nurse had Influenza on December 31st (*i.e.*, before McCarthy). She had been the day before to the seminary at Mill Hill; there had been no Influenza there, but it is possible that she might have contracted infection on her way thither through London. The servant in the infirmary, who had accompanied the nurse to Mill Hill, had Influenza on January 3rd, and the two other nurses on January 4th and January 9th.

The nurses on their attack were at once isolated in their own quarters. There were at the time in the infirmary 23 boys suffering from other complaints, none of whom took Influenza, although they came over to the distribution of toys on January 1st, and were attended by the nurses before the latter were isolated.

Of the non-resident staff two had Influenza, one beginning on January 3rd, and one on January 6th. The former would have little communication with the boys.

No illness was observed among animals (cows, pigs, dogs, cats, and fowls) kept on the premises. The boys as soon as they were noticed to be ill were removed to one of the dormitories which was set apart for the purpose. The cases were mild and most of them were convalescent in four or five days, but two of them had relapses a day or two after their discharge.

Dr. G. Macdonald, of Southall, medical officer to the Orphanage, sends me the following notes respecting the epidemic of Influenza there, and at the St. Marylebone Schools for pauper children, which also are situated at Southall.

"The class of children at the St. Marylebone Schools is the same as that of North Hyde, but the children are admitted for nine months, and there are girls as well as boys. Very singular to relate Influenza appeared in both schools on the same day, namely, 3rd January, but its duration and severity was quite different. Of course the case of the Sister at North Hyde occurred on the 31st December, but she had no communication with the boys at all, as she was laid up in a building away from the schools as well as from the infirmary to an extent, and as no cases of Influenza occurred in the children occupying the infirmary, it is reasonable to suppose she infected nobody except another Sister who attended her.

The boy McCarthy, with whom the epidemic at North Hyde was suspected to have begun, did not have Influenza at all. I was on the look out for the disease, having had cases in private practice as early as the 18th December, and I examined him on January 3rd and found he was a delicate boy, but there was nothing else the matter with him. When I visited the schools on the 3rd, there were six boys with Influenza, and about two hours after I visited the St. Marylebone Schools and found two infants in bed with it. The disease was much quicker over at North Hyde, as it only lasted from the 3rd to the 8th January, whereas at St. Marylebone it began on the 3rd and terminated on the 26th. The epidemic was also much more general at St. Marylebone, as—

Out of 87 infants there were 48 cases		
113 girls	„	93 „
146 boys	„	46 „

or 187 cases in 346 children, and there were also 13 officers and servants affected. Many of the cases in infant schools had a good deal of fever as well as sickness, which was a very common symptom in the younger children. I had also about 300 cases in private practice of all ages and conditions, and amongst the adults I found the rheumatic symptoms

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at St. Maryle-
bone Schools,
Southall;

the more general in males, and neuralgic in females. The perversion of taste was universal as well as the extreme debility and depression. Happily I had no fatal case.

"In some respects the intercommunication is more intimate at the St. Marylebone Schools than at North Hyde, as all the children have their meals in one large hall, and the girls assist in the infants' department.

"As I have before mentioned December 18th was the first case at Southall, followed on 23rd by another case in the same house, and then on the 27th by a third, all of them the children of a clerk employed at Paddington who goes to town daily. On the 28th I had several in different parts of the parish who, as far as I know, had no communication with each other.

"Although the epidemic has all but subsided I had a case to-day with all the characteristic symptoms, but the disease is gradually dying out.

GEORGE McDONALD."

"Southall, 21st February 1890."

OUTBREAK at the LONDON ORPHAN ASYLUM.

at London
Orphan Asylum;

This institution is situated at Watford, 17 miles N.W. of London, in an open situation on a subsoil of gravel resting on chalk.

The number of inmates and of cases of Influenza among them is thus shown:—

				Number of Inmates.	Cases of Influenza.	Per-centage attacked.
Orphans	Boys	-	-	302	70	23·2
	Girls	-	-	167	44	26·4
Resident staff.	Officers	-	-	21	2	9·5
	Servants	-	-	28	4	14·3
						24·4
						12·3

The children have thus been attacked in twice the proportion of the attacks among the adult staff, and the girls have suffered in somewhat larger proportions than the boys.

The outbreak among the girls did not commence till more than a week after that among the boys, and when it occurred, was more sudden and sooner over.

There is a difference between the mode of life of the boys and girls, which may perhaps explain these differences. The boys are lodged in seven different houses, each under the care of a matron. Each house has two bedrooms, containing 25 beds apiece, but the lavatory and day-room are used in common by all the boys in the house. The senior boys, in the three upper houses, have a different playground from the junior boys in the four lower houses. Boys from the same house attend different classes in the school. The girls on the other hand occupy a single wing, in which there are four dormitories, with 50 beds in each, two schoolrooms and a play-room.

The whole of the children, both boys and girls, meet three times a day at meals in a lofty and well-ventilated hall, and also at chapel daily, the boys and girls on both occasions sitting on opposite sides of a large building.

Supposing an infectious disease to be introduced, there are thus opportunities for its dissemination through the whole establishment, but

these opportunities are greater among the girls than among the boys, and greater among children of the same sex than between those of different sexes.

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The following are the dates of admission to the infirmary of the several cases:—

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	JANUARY																		
	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	
Boys	-	1	7	1	3	-	2	2	-	-	7	4	2	1	2	4	-	11	6
Girls	-	-	-	-	-	-	-	-	-	4	6	7	6	-	7	4	-	2	3

	FEBRUARY															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	
Boys	-	3	2	-	1	2	-	2	2	-	1	2	-	-	1	-
Girls	-	1	-	1	-	-	2	1	-	-	-	-	-	-	-	-

None since 14th.

Of the staff the first case of Influenza was that of the warden who was ill before Christmas, the second the infirmary matron who began January 11th. The servants attacked were two laundrymaids and two housemaids; of these one housemaid began January 19th, one laundrymaid January 21st, and the other two in the course of the same week.

The cases of Influenza are stated by Dr. Brett, the medical officer, to have been pretty evenly distributed throughout the school; no special incidence upon the boys in any particular house being noticed, such as he has found to happen when measles or scarlet fever has broken out.

Influenza had been prevalent in the town of Watford for more than a week before it broke out at the Orphan Asylum. Dr. Brett, as Medical Officer of Health, reports the first case to have been observed in the town on December 24th, and the disease to have become extensively prevalent about January 6th. The asylum is close to the town, but the children have little communication with it.

The majority of the children spend the Christmas holidays with their friends, those who have no friends to go to remaining at the asylum. At Christmas 1889 about 114 children (72 boys and 42 girls) remained at the asylum, and 355 (230 boys and 125 girls) went away. They went on December 20th, and returned on January 13th. They went to various parts of England, but the majority to London and places in the neighbourhood thereof; no child is known to have suffered from Influenza while away for the holidays.

None of the children who remained at the asylum suffered from Influenza during the holidays, nor for some days after the return of the others, the earliest case among them being on January 17th. The first 11 cases of Influenza were all among boys who had been away for the holidays mostly to London, or to places in returning from which they would pass through London.

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The earliest, however, beginning on the morning of January 14th had been to Richmond; Surrey, and the second, beginning later the same day, but not admitted to hospital till January 15th, to Woburn Sands, Bedfordshire, and neither of these returned through London. Influenza, however, had been prevalent in the neighbourhood of Richmond since the end of December or beginning of January, and is reported by the Medical Officer of Health of the Woburn Rural Sanitary District to have occurred in that district on January 12th.

Of the girls none were attacked till January 22nd, and one of those attacked on that day had not been away for the holidays.

The facts seem to point to the Influenza having been contracted in all the earlier cases outside the asylum, perhaps on the journey back. In only one case was there a history of any illness in the house at which the boy had been staying; this boy's sister had had "a cold" two days before he left; he began to be ill on the morning of January 15th. As these early cases occurred in five out of the seven houses there was opportunity for many boys to have come in contact with infection; and the subsequent spread among them may thus be explained. Later on by some means which I have not been able to ascertain, perhaps through the medium of some unrecognised case, the disease was transferred to the girls' side, and established itself there; the closer communication among the girls than among the boys accounting for its more rapid propagation on that side. How it happened that no girl contracted the disease outside the asylum while (if the period of incubation be reckoned at one to three days) eight or nine boys did so I cannot say.

The escape of the girls for more than a week, while the disease was spreading among the boys, seems to show that the cause was not any general atmospheric condition, which would presumably act nearly equally on the two sexes; unless it be supposed that the period of incubation is longer among girls than boys.* That the susceptibility of girls is less than that of boys can hardly be the case, in view of the larger proportion of the former who suffered. Since both sexes met several times a day in enclosed spaces, large and airy though they may be, it would seem to follow, from the escape of the girls at first, that the infection cannot be very readily diffusible through the air.

The cases as soon as heard of were removed to the infirmary for treatment, but it occasionally happened that the children remained for some hours in association with others before their removal.

The majority of the cases were mild, and no deaths occurred.

OUTBREAK at the GORDON BOYS' HOME, WEST END, CHOBHAM.

at Gordon Boys'
Home, Chob-
ham;

The Gordon Boys' Home stands in an isolated situation on Bagshot Heath, Surrey. The inmates consist of 180 to 190 boys, of ages from 14 to 18 years, with the staff and their families, 32 in all. Among the boys 85 cases of Influenza occurred, and 6 among the staff and the members of their households. The first recognised cases occurred on Sunday evening, January 5th, when several boys were taken ill together, and were admitted to the infirmary on January 6th, but two cases of "catarrh," one of them being noted as "severe," were admitted there on January 1st.

* One of the four girls first taken had not been away for the holidays, and must therefore have contracted the disease at the asylum. The girls on the return journey to school travelled in different coaches to the boys. The boys are more in the open air than the girls, but Dr. Brett does not think the difference between the two sexes in this respect very great.

The daily numbers of new cases admitted to the infirmary were as follows :—

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	JANUARY										Total.
	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	
Admissions	12	24	8	11	10	2	7	7	4	2	87

there having been at the date of my visit on January 18th no new cases for three days, nor did any occur afterwards.

No one set of boys had been observed to be more affected than another. In fact there are no distinct groups among them; those who sleep in different dormitories meeting in the same mess-room and on other occasions. The boys spend about five hours of each day in school, the remainder in workshops, garden, drilling-grounds, &c., being much in the open air, except when the weather is wet.

On December 24th, 22 boys had gone on leave to visit their friends; 14 of them to London, the rest to various provincial towns. They all returned on January 2nd before 6 p.m., except three boys from the northern counties who did not return till January 6th. Of the boys on leave two suffered in London, in different localities, what were considered to be attacks of Influenza, though neither was seen by a medical man; both had frontal headache, pains in the limbs, and nausea or vomiting, with other symptoms of Influenza. One began to be ill on December 29th, another case in the same house following next day; the other boy began on December 30th; both returned to the Home on January 2nd, though neither was quite recovered.

The circumstances of the outbreak are compatible with the supposition that its cause was the return to the Home on January 2nd of one or more boys in an infectious condition; the outbreak commencing on January 5th.

Dr. Hope, medical officer to the Home, states that there was at that time no Influenza in that locality outside the Home; the earliest case in his practice outside was on January 17th, and was several miles distant.

There were six cases among the staff of the Home and their households, the earliest beginning to be ill on January 7th.

In a letter subsequently received from Dr. Hope he stated that the after effects of the epidemic at the Gordon Boys' Home had been unexpected, for while before the outbreak he had always cases more or less acute of "chill," bronchitis, &c., for a month after it was over he had not a single case of any disease to report, although February was a bleak month, and the situation of the Home is by no means sheltered.

INFLUENZA at HER MAJESTY'S CONVICT PRISON, WORMWOOD SCRUBS.

This prison is situated on the western outskirts of London in an open situation; the surface being flat and the soil clayey. It contained at the end of January 419 prisoners located in two halls, viz., 188 in the B. hall, and 231 in the C. hall. The staff consisted of 82 warders and

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Scrubs;

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4 superior officers. The prisoners who at the time of the epidemic were all on long sentences, five years and upwards, are received in batches from the local prisons in which they have spent the first week or 10 days of their sentence; they are certified to be in good health by the medical officer of the local prisons before removal, and are examined by the medical officer of the convict prison on their reception. For the first nine months of their sentence they work in separate cells, and after that in workshops, or in gangs in the open air. The men in the C. hall are employed in their cells, about 12 in picking oakum or coir, and the remainder in making up waterproof bags for the Post Office. These men spend their time indoors and in separate cells, except at exercise when they walk for an hour daily in the open air, keeping in single file four or five paces apart, and at chapel for 10 minutes on weekday mornings, and for an hour morning and afternoon on Sundays. They are, however, visited in their cells at frequent intervals during each day by the prison officials, each prisoner being visited by one or the other of two particular warders on duty in his ward.

Of the men in the B. hall who work in association, 80 worked in the open air, and 108 in various workshops, but even the men who work in shops are more or less exposed to the open air. The men in the B. hall generally are therefore more exposed to the open air than those in the C. hall; they are more in association with one another, and they come in contact with a larger number of different warders; they also get a better diet than the others. Of these two classes of men, those in the B. hall were first and chiefly attacked by Influenza, those working in the open air being especially affected.

ADMISSIONS TO HOSPITAL.—INFLUENZA.

Date.	PRISONERS.					Warders. attacked.
	Total.	B. Hall. At associated Labour. (188 Men.)		C. Hall. At Labour in separate Cells. (231 Men.)		
		In open Air. (80 Men.)	In Sheds. (108 Men.)	Coir and Oakum picking. (12 Men.)	Bag making. (119 Men.)	
1890.						
January 2 -	1	—	1	—	—	—
„ 3 -	—	—	—	—	—	—
„ 4 -	2	2	—	—	—	—
„ 5 -	—	—	—	—	—	—
„ 6 -	—	—	—	—	—	1
„ 7 -	2	2	—	—	—	4
„ 8 -	6	3	3	—	—	—
„ 9 -	14	10	4	—	—	—
„ 10 -	3	2	1	—	—	—
„ 11 -	3	3	—	—	—	—

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Date.	PRISONERS.					Warders attacked.
	Total.	B. Hall. At associated Labour. (188 Men.)		C. Hall. At Labour in separate Cells. (231 Men.)		
		In open Air. (80 Men.)	In Sheds. (108 Men.)	Coir and Oakum picking. (12 Men.)	Bag making. (219 Men.)	
1890.						
January 12 -	5	4	—	—	1	—
„ 13 -	4	2	—	—	2	—
„ 14 -	1	—	1	—	—	—
„ 15 -	1	1	—	—	—	1
„ 16 -	3	—	—	2	1	—
„ 17 -	1	—	—	—	1	1
„ 18 -	2	—	—	—	2	—
„ 19 -	2	—	—	2	—	1
„ 20 -	3	2	1	—	—	—
„ 21 -	1	—	—	—	1	1
„ 22 -	—	—	—	—	—	—
„ 23 -	—	—	—	—	—	—
„ 24 -	—	—	—	—	—	—
„ 25 -	—	—	—	—	—	—
„ 26 -	1	—	1	—	—	—
Total -	55	31	12	4	8	9
Per-centage attacked.	13·1	38·8	11·1	33·3	3·7	11·0
		22·9		5·2		

The case recorded for January 2nd is described by Dr. Patmore medical officer to the prison, as having been a doubtful one, the chief symptom being congestion of the fauces. The man was a blacksmith working in a shed. The disease is not known to have been introduced by any prisoner, and the circumstances attending the reception of prisoners would render it very unlikely that the disease was so introduced, since the new prisoners work in their cells, and not in association. No prisoner who suffered from Influenza had received a visit from his friends within seven days before his illness.

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The dates of the illnesses of the warders who were treated in hospital for Influenza were as follows:—

JANUARY						Total.
6.	7.	15.	17.	19.	21.	
1	4	1	1	1	1	9

These therefore were subsequent to the outbreak among the prisoners. Several of the warders, however, had attacks resembling Influenza, but did not go off duty. (It is stated that the regulations as to sick leave tend to render the warders unwilling to give up work unless they are obliged to. The prisoners on the other hand are generally ready to complain of illness, unless employed in what is considered work of a desirable kind which they do not wish to risk losing.)

The dates of these suspected cases among the warders, and the location of the warders affected, were as follows:—

Date when first ill.	Where employed.
December 25 - -	C. hall.
January 1 - -	Officers' mess room.
" 2 - -	C. hall.
" 3 - -	B. hall, and open-air works.
" 10 - -	B. hall, and open-air works.

Another warder admitted to the Infirmary for Influenza on January 7th had been unwell since his return on December 4th from Parkhurst prison in the Isle of Wight, and had been off duty for part of the time, but was on duty in the C. hall from December 31st to January 6th inclusive. A member of his family was taken ill with catarrh on January 2nd, another on January 9th, and two others on January 19th and 23rd. There were thus opportunities for the introduction of infection into the C. hall, but this was not the hall first or most largely attacked. Dr. Patmore, however, says: "Cases in C. hall being all at work in the closed cells would be less likely to complain of the initial attack promptly than men in the open air, therefore there may have been more early cases in the C. hall than are shown in the table."

Dr. Patmore thinks that the spread of the disease was greatly arrested by not allowing exercise or work in the open air when the weather was wet, very cold, or windy.

OUTBREAK OF INFLUENZA AT HER MAJESTY'S PRISON, WANDSWORTH.

at Wandsworth
Prison;

The Wandsworth prison is a "local" prison for males only, receiving convicted prisoners on sentences varying from three days to two years, and also debtors, but not prisoners on remand. It consists of two detached blocks, of which the larger contains 842 cells, in five wings, A. to E.; and the smaller 201 cells, in three wings, G. H. and K. The daily average population of the prison during the epidemic period was 902. The prisoners mostly work in separate cells, but are in close association together every morning at chapel, and meet also at exercise

daily in the open air (except in wet weather when they exercise indoors), walking in single file 3 yards apart. The following are the occupations at which the prisoners in the several wings are principally occupied.

- A. Wheat grinding, workshops, garden, cleaners, bookbinders, fibre plaiting.
- B. Brush-makers, shoe-makers, tailors, knitting, fibre.
- C. Mat making.
- D. Pumping water, and oakum picking.
- E. Cranks and oakum.
- G. Laundry.
- H. Hammock and bag making.
- K. Oakum picking. Debtors (who do not do hard labour).

The number of men employed daily at the several occupations cannot be given, as the population of the prison is a fluctuating one; 150 to 200 men being received and discharged every week. The daily average population of 902 represents therefore a considerably larger number of individuals confined in the prison during the epidemic period.

The outbreak of Influenza seems to have commenced on January 1st, although the three cases which occurred on that day should, in the opinion of Dr. Quinton, medical officer of the prison, be called "suspicious" only. Previous to this in the last few days of December, there were men complaining of colds, but these appeared to be only ordinary catarrh. A warder went off duty with symptoms of Influenza on December 30th.

The epidemic rapidly increased, and remained at its height for a week, after which it declined, and no fresh case occurred after January 21st.

The number of cases among the prisoners, and their location in the prison, are shown in the following table:—

Wing.	Number of Cells.	CASES OCCURRING ON JANUARY																				Total.		
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.		21.	
Main prison.	A.	143	—	1	1	3	—	1	1	5	4	—	3	1	2	—	3	—	—	—	1	—	—	26
	B.	164	—	—	1	3	3	3	3	1	3	2	1	—	1	—	—	2	—	—	—	1	1	25
	C.	261	—	8	1	7	2	7	4	4	1	1	3	3	—	1	1	1	—	—	—	—	—	44
	D.	153	2	1	1	1	—	4	1	—	1	1	—	—	—	1	1	1	—	—	—	—	—	15
	E.	121	1	—	1	—	3	1	2	—	—	1	3	—	—	1	1	1	—	—	—	—	—	15
Detached prison.	G.	36	—	—	—	—	1	2	—	2	1	—	—	—	—	—	—	—	—	—	—	—	6	
	H.	90	—	2	—	2	3	—	1	—	1	1	2	2	1	1	2	—	—	—	—	—	18	
	K.	75	—	2	2	1	1	—	1	—	1	1	1	—	—	—	3	—	—	—	—	—	13	
Totals	1,043	3	14	7	17	12	17	15	10	13	8	13	6	4	4	11	5	—	—	1	1	1	162	

The proportion of prisoners attacked was therefore 18 per cent. of the average daily population. Among the staff, numbering 87, 19 cases occurred, or 22 per cent. The officials were therefore attacked in greater proportion than the prisoners, and as the former consisted during the epidemic period for the most part of the same individuals, while the prisoners were a constantly changing body, the difference was really greater than the figures show (unless we assume that the chances of contracting Influenza were as great outside as inside the prison).

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The distribution of cases among the staff was as follows:—

		Dec. 30.	Jan. 1.	Jan. 6.	Jan. 8.	Jan. 9.	Jan. 10.	Jan. 11.	Jan. 14.	Jan. 20.	Jan. 22.	Total.	
Warders on duty in wings	A. - - -	—	—	1	1	—	—	—	—	—	—	2	
	B. - - -	—	1	—	—	—	—	—	1	—	—	2	
	C. - - -	1	—	1	—	1	—	—	—	—	—	3	
	D. - - -	—	—	1	1	—	—	—	—	—	—	2	
	E. - - -	—	—	—	—	1	—	—	—	—	—	1	
	G. - - -	—	—	—	—	—	—	—	—	—	—	—	
	H. - - -	—	—	1	—	—	—	—	—	—	—	—	1
	K. - - -	—	—	—	—	—	—	—	—	—	—	—	—
Hospital -	—	—	—	—	—	—	—	—	—	—	1	1	
No special location	—	1	3	—	—	—	1	1	—	1	—	7	
Total - -	1	2	7	2	2	1	1	1	1	1	1	19	

The warder who was first attacked lived outside the prison; there had been no previous cases of Influenza in his household, but his wife suffered later. He first felt ill on Saturday, December 28th, but continued at duty till the evening. Next day, being Sunday, he was off duty. On December 30th he came to the prison at 6 a.m., but feeling unfit for duty he returned home on the sick list until January 1st, when he again came on duty at 10 a.m. He was on duty in the C. wing, on the third landing. The earliest cases of Influenza among the prisoners were not in that wing; but two out of the three were prisoners who sat near this warder at chapel. On January 2nd there were eight cases of Influenza from this wing, out of a total number of 14 cases, but only two of them were from the landing on which the warder in question did duty. The number of cases in this wing was larger than in any other, but the number of prisoners in it is greater; they are employed in mat making, and are comparatively stationary.

The warder who went on the sick list on January 1st had been feeling unwell for four or five days before. He was employed in superintending shoe making in the shoe-makers' shop (where 10 men work, and in the B. wing where other men are employed in their cells at the same work), but these men were not specially early attacked.

Few prisoners work in the open air. No one group of prisoners or quarter of the building was observed to be especially attacked.

For further particulars of the outbreak, especially as to the clinical features of the cases, I may refer to an account of it in the *British Medical Journal* of February 22nd, 1890, by Dr. Quinton, medical officer to the prison, to whom I am indebted for the information here given.

OUTBREAK at HER MAJESTY'S PRISON, PENTONVILLE.

at Pentonville
Prison;

The Pentonville prison receives only male convicted prisoners for short terms up to two years. The number of cells is 1,200, in four wards, A. to D., each with five flights or tiers of cells. The average number of prisoners in January 1890 was 1,126, of whom about 100 worked on the treadmill, 208 in workshops, and the remainder in their cells, very few working in the open air. The men in one ward exercise together, but those in different wards meet only at chapel. The staff number 98.

The first recognized case of Influenza occurred on January 3rd, and between that date and January 30th, when the last occurred, 84 prisoners in all were attacked, or 7.6 per cent. of the total number. Of the warders and officers 19, or 19.2 per cent., were attacked.

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The disease occurred first among the men working in association, and its incidence was greatest among them in proportion to their number which is much less than that of the men working in their cells; the percentage of cases among the former being 12·4, and among the latter only 5·7. Of 55 men in hospital none took the disease except a prisoner employed there in cleaning; although up to January 13th all the cases were removed thither. The following are the numbers of cases among particular groups of men working in common:—

Work.	Number.	Influenza Cases.	Per-centage attacked.
Carpenters - - - -	36	8	22·2
Mat-makers - - - -	30	5	16·7
Laundry - - - -	33	5	15·1
Boot-makers - - - -	21	4	19·1
Wheelmen - - - -	100	1	1·0

The men working on the wheel are not in association in the same degree as the others; they all work in one building, but are not allowed to mix together, and in walking to and from work they are obliged to keep four yards apart. Excluding them, the rate of Influenza attacks upon the men working in association was 17·7 per cent. or greater than that on men working in their cells.

Of the staff, 16 warders and assistant-warders and a clerk, the engineer and medical officer, took the disease. Some few of the warders had it in a mild form, and continued at their work, *e.g.*, one in A. ward, who was poorly on January 5th, and one in C. ward who was poorly on January 10th. Two warders in the D. ward, who slept outside the prison, went into hospital with Influenza on December 30th and January 2nd respectively, but had each been unwell about two days before; they returned to duty, the first on January 13th, the second on January 10th.

In the B. ward, in which cases of Influenza occurred earliest and were most numerous, no warders suffered from the disease, but two of them lived in houses in which there had been cases of Influenza before the outbreak at the prison.

There is no evidence that infection was introduced by any prisoner. From December 28th to January 1st, two prisoners were admitted with "cold" (temperature normal), and two with bronchitis; these were sent from the reception ward to hospital, and the two with bronchitis were discharged from hospital at the expiration of their sentence, so that they did not come into association with other prisoners, except with those in hospital, who did not get Influenza.

OUTBREAK at HER MAJESTY'S PRISON, BIRMINGHAM.

at Birmingham
Prison;

The Birmingham prison is situated on high ground in a comparatively open part of the city on its north-west border. It is a "local" prison, receiving short-sentence prisoners from the neighbourhood, also prisoners on remand and debtors. It contains 454 cells for male prisoners arranged in four divisions, and 110 cells for females in another division.

At the time of the epidemic, however, the average daily number of prisoners was only 347, *viz.*, 289 males and 58 females. The staff comprises 38 male and 7 female warders, and 4 superior officers, total 49.

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FEMALES.

Labour.	Where Labour Parties principally located.	Daily average Number of each Party.	No. of Cases of Influenza.	Per-centage.
Sewing - - -	G.	15	4	26·6
Oakum - - -	G.	11	4	36·3
Laundry - - -	G.	16	4	25·0
Orderly - - -	G.	5	1	20·0
Kitchen - - -	G.	1*	2	200·0
Non-effective - - -	G.	4	2	50·0
Nurse - - -	G.	1	—	—
In Hospital or not otherwise described.	G.	5	—	—
		58	17	

* A successor to the first patient was also taken ill.

It is noteworthy, that contrary to the experience at other prisons, men working in the open air or in shops entirely escaped the disease; among 62 such men there was not a single case. Excluding certain small groups, the class of male prisoners most affected was the mat-makers. These men work in separate cells, but owing to the requirements of their trade, there is said to be much more communication between one and another than between prisoners working in their cells at other occupations, *e.g.*, oakum picking. They are also located in the particular division of the prison, the C. division, into which Influenza was first introduced, and which suffered from it more severely than any other on the male side.

The following is the proportion of prisoners attacked in the several divisions :—

Division.	Number of Cells.	Daily average number of Prisoners.	Influenza Cases.	Per Cent.
Males - - -	A.	109	4	7·0
	B.	163	9	9·4
	C.	123	26	26·5
	D.	59	38	7·8
Females - - -	G.	110	17	29·2

In the earlier part of the epidemic period, the C. division was especially affected, but in the latter part the cases were most numerous proportionally on the female side.

The earliest case of distinct Influenza was that of a man admitted on January 7th, and who was unwell on his admission to prison, complaining of pains all over, which he attributed to his having been knocked about. On January 9th he was found to have high temperature and other symptoms of Influenza. In the meantime he had been in a cell in the C. division, and exercised in company with the other men in that division on the morning of January 8th. On January 9th, five men, all in the C. division, were taken ill, one of them being the man in the next cell to the first patient and who walked behind him at exercise. Other cases followed in the following days, and indeed, with two exceptions, all the earlier cases on the men's side were in the C. division. The exceptions were two men, one in B. and one in D. division, who were taken ill on January 8th; these men acted as orderlies, and might have had occasion to go into any part of the prison except the female side.

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It may be mentioned that in an "association cell" in the B. division, occupied by four inmates, three out of the four suffered from Influenza, the first being an orderly.

On the female side two prisoners and a warder were taken ill within a few hours of each other on January 8-9th. The circumstance that their work would bring them together in the female officers' kitchen, seems to point to a common exposure to some source of infection there. The women employed in the laundry, in which the clothes from the whole prison are washed, have not suffered in a larger proportion than others; out of a daily average number of 16 so employed (representing, as most of the female prisoners are in for short terms, a larger number of individuals) there have been 4 cases of Influenza; the laundry warder was also attacked.

Several prisoners, both males and females, were attacked with Influenza on the day of their admission, beginning with shivering just after their bath. They were no doubt incubating the disease on admission.

Influenza had been present in Birmingham among the general population since about December 23rd, and began to prevail as an epidemic about January 4th.

It is noteworthy that in the Birmingham City Lunatic Asylum, which closely adjoins the prison, lying east of it about 200 feet distant, and which contains 600 beds, there was not until February 5th a single case of Influenza. On that day, however, a case occurred, and once introduced the disease spread rapidly. This circumstance, and the exemption of the prisoners who worked in the open air, seem to show that at Birmingham, at least, the cause of the epidemic was not any condition of the general atmosphere. The circumstances of its occurrence and spread in the prison point rather to personally conveyed infection.

As a prophylactic measure each prisoner was required from January 17th to take eight grains of quinine daily.

A further account of the epidemic in the Birmingham prison is given in the "Birmingham Medical Review" of March 1890, by Mr. Arthur Price, medical officer, to whom I am indebted for information and assistance.

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OUTBREAK at the BIRMINGHAM CITY ASYLUM, WINSON GREEN.

Mr. E. B. Whitcombe, the medical superintendent of this asylum, has kindly furnished me with the following information respecting the outbreak of Influenza there.

1890.

at Winson Green
Asylum, Bir-
mingham;

Date.	Male Officers.	Male Patients.	Female Officers.	Female Patients.	Remarks.
February 5 - -	1	1	—	—	
" 6 - -	—	5	—	—	Employment of patients :— Male.—9 at farm work. 9 at indoor work. 6 not employed.
" 7 - -	4	2	2	3	
" 8 - -	1	—	2	1	
" 9 - -	1	—	—	2	
" 10 - -	4	2	2	6	
" 11 - -	2	—	—	5	
" 12 - -	1	—	3	1	Female.—13 needlework. 6 laundry. 6 housework. 2 kitchen. 8 not employed.
" 13 - -	—	1	1	4	
" 14 - -	—	—	1	1	
" 15 - -	—	1	1	1	
" 16 - -	—	—	—	1	
" 17 - -	—	—	1	1	
" 18 - -	—	3	—	4	Condition as to health. Male.—1 epileptic. 1 general paralytic. 1 feeble.
" 19 - -	—	—	1*	3	
" 20 - -	—	1	—	—	
" 21 - -	—	1	—	—	All others in good health. Female.—1 pregnant. 1 feeble.
" 22 - -	—	2	—	1	
" 24 - -	—	2	—	—	All others in good health.
" 27 - -	—	1	—	—	
" 28 - -	—	1	—	—	
March 1 - -	—	1	—	—	
" 2 - -	1	—	—	—	
" 5 - -	—	—	—	1	
	15	24	14	35	
Average numbers resi- dent - - - }	36	280	40	300	Officers :— Male.—2 medical. 1 head attendant. 1 storekeeper.† 8 attendants. 1 tailor.† 1 carpenter.† 1 painter.† Females.—12 nurses. 1 housemaid. 1 kitchenmaid.
Per-centage attacked -	42	8·6	35	11·7	
General features of the disease which were fairly uniform.	<i>Sudden prostration. General muscular pains. Pains in head and back. In- creased temperature, lasting for three days.</i>				
Treatment - - -	Antifebrin, grs. x. Tonics and stimu- lants.				

* Employed on male side.

† Non-resident.

The epidemic commenced on February 5th, attacking a healthy patient and an attendant who had been constantly employed at the farm. It soon became general, and was not limited to any particular class of individuals or locality, though the proportion of officers attacked was much greater than that of the patients.

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The mode of introduction cannot be specified. The asylum is always accessible to the public. Visiting is allowed every Tuesday; patients go beyond the grounds daily, and attendants and nurses are out every day. On Tuesday, February 4th, 65 patients were visited by friends, so that over 100 persons would be in the asylum on that day from the outside.

INFLUENZA at the WESTERN FEVER HOSPITAL, LONDON.

The following notes are communicated by my present colleague in the Medical Department of the Local Government Board, Mr. Sweeting, who was then Resident Medical Officer:—

at Western
Fever Hospital,
London;

“ We had at the Western Fever Hospital in all 15 cases of Influenza in January and February thus made up:—

- 1 ambulance driver (out of 8), attacked January 3rd (he lives at the adjacent ambulance station).
- 2 nurses (out of 35), attacked January 4th and February 1st.
- 5 laundry maids (out of 7), attacked January 15, 16, 20, February 3rd and 7th (giving an aggregate incidence upon these classes of the staff of 16 per cent.
- 5 patients only, viz.:—
 - 1 male scarlet-fever patient, attacked January 21st in Ward 10.
 - 1 female ” ” ” ” ” 3.
 - 1 ” ” ” ” January 23rd, ” 4.
 - 1 ” ” ” ” January 25th, ” 8.
 - 1 ” diphtheria ” ” February 4th, ” 5.

Hence 3 female scarlet-fever patients, 1 male scarlet-fever patient, and one female diphtheria patient contracted Influenza, all in different wards.

The mean total number of cases at this time was 160, of whom 110 were convalescents.

(The incidence of Influenza upon the patients, therefore, was only 3·1 per cent.)

- 2 of my own household (out of 8), attacked January 8th and 11th.

—
15 Total cases.
—

My two servants were attacked *after* the visit, on January 3rd and 4th, of a French friend from Paris, who had been in intimate relation with the disease, and who was just recovering from it. (? Mediate infection.)

The greatly disproportionate incidence in the *laundry* is worth attention; and also the fact that they began to be attacked shortly after my servants, whose clothes went there to be washed. (? Fomites.)

Follicular tonsillitis is an occasional complication. Two cases had rashes, one papular, one erythematous. The symptoms were the usual ones, of the muscular form chiefly.”

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at Kerrison
Reformatory;

INFLUENZA at the KERRISON REFORMATORY, THORNDON, SUFFOLK.

The following particulars are given by Dr. E. G. Barnes, Medical Officer of Health for the Hartismere Rural district:—

Of 87 boys in the reformatory, 67 or 77 per cent. suffered from Influenza in January 1890.

The dates of commencement of the cases were as follows:—

January 1890	-	-	5.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	28.	Total.
Number of cases	-	-	1	1	1	1	3	16	22	10	6	3	1	1	1	67

OUTBREAK OF INFLUENZA at KING EDWARD'S SCHOOLS, SOUTHWARK.

at King
Edward's
Schools, South-
wark;

This information is furnished by Dr. Hubert C. Bristowe, who has published an account of the outbreak in the "British Medical Journal," of February 22nd, 1890.

King Edward's Schools are situated in St. George's Road, London, S.E., in the same grounds as Bethlem Hospital. They contain in all 240 girls of ages varying from 11 to 16: of whom 175 were affected with Influenza, or about 73 per cent. of the whole number. The resident staff numbers 14, all females, of whom two suffered.

The schools first came under Dr. H. C. Bristowe's medical care on January 17th, 1890. Before that date there had been one or two cases of Influenza, of which however, no notes were taken. On the morning of January 17th, there were four cases, and the progress of the epidemic was as follows:—

1890	-	-	-	-	Jan. 17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	Total.
New cases	-	-	-	-	4	3	21	49	44	12	12	19	11	1	0	1	177

No case occurred after January 28th.

The girls spend a great deal of time in the open air, but only in the grounds connected with the schools, and have practically no communication with the outside world: except through the mistresses and medical officer: they all remained at the schools during Christmas time. In the normal state of things the girls all meet together at meal times, and in the grounds; in fact they are always together. The schools being industrial schools they are not much divided up into classes. No marked difference was noticed in the severity of attack in different dormitories; if anything, those last affected suffered most severely.

In almost all cases the disease was mild, and there were no deaths. In all cases the symptoms rapidly subsided, the pain and high temperature being over in two days, and convalescence was completed in a week, except in the cases in which pulmonary complications supervened.

[In this account it is to be noticed that at these schools in the heart of South London, the epidemic did not commence until January 17th,

or more than a fortnight after its commencement in London generally (which may be taken as about January 1st), and in connexion with this that the girls, though much in the open air, were debarred from communication with the outside world. The inference is that the disease was not contracted through the general atmosphere: it is more probable that infection was brought by means of the staff, but unfortunately information as to the antecedent circumstances is wanting. The speedy development and rapid decline of the epidemic among the girls much in contact with each other is also to be noticed; it was over in about 12 days, whereas in prisons it lasted three or four weeks].

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Dr. Parsons.

CHAP. IX.

INFLUENZA at the INDUSTRIAL SCHOOLS, SWINTON, near MANCHESTER.
Communicated by W. F. O'GRADY, Medical Officer.

"Epidemic Influenza had been very prevalent in the district for the past few weeks, but although several cases of pneumonia and simple catarrh arose in the schools, it was not till the 5th March (Wednesday) that I observed any characteristic cases there.

at Swinton
Industrial
Schools.

On that day there were	-	-	7	new cases.
On March 6th	-	-	71	" "
" 7th	-	-	30	" "
" 8th	-	-	7	" "
" 9th	-	-	20	" "
" 10th	-	-	8	" "
" 11th	-	-	7	" "
" 12th	-	-	12	" "
" 16th	-	-	2	" "
" 18th	-	-	7	" "

making in all 171 cases.

"There were in March 1890 in the schools 589 children; the proportion affected was 29·0 per cent.

"The children were all convalescent by March 17th, with the exception of two cases who have catarrhal pneumonia as a sequela.

"Among the resident staff numbering 33, the matron, three schoolmistresses, three nurses, two cooks, and one attendant, total 10 or 30·4 per cent., were attacked. They all have done well, though some of them were very debilitated. Five of the staff were attacked on March 6th, two on March 10th, and three on March 11th.

"I noticed the same rule as to children and adults in outside practice as observed in the schools, viz., that adults are much more severely attacked, that in them sequela are more frequently observed, and convalescence more protracted than in children.

"The disease raged in the village from the 3rd February to the 10th March, but did not appear in the schools till the 6th March. I should imagine it must have been introduced through the air, as when it appeared every child at all susceptible was attacked in a few days. The proportion of boys attacked was 25·5 per cent., of girls 37·5 per cent. Both boys and girls were attacked at the same time. The schools are in the centre of the village. Being a half-time school (half school, half labour) those children working on the farm, which is in the school grounds—(and we make nearly every boy take his turn for health's sake)—are out in the air for a considerable time. A field of about 4 acres is also used as a cricket and football ground. The gymnasium

are both in the open, though roofed in. The children go daily for a walk through the country, but no contact with other children is permitted. Several officers are non-resident. Grown-up children are frequently sent on errands into the village to give them an idea of shopping. Visitors from Manchester are permitted to see the children on Wednesday and Saturday. There are a number of officers who reside off the premises, but visit daily, besides the resident staff.

"There are two main school rooms, one for boys and one for girls, while the infants under seven have three schoolrooms. There are a number of dormitories holding from 20 to 40 beds. Children work at different trades in rooms apart. Children of different sexes meet at church, at meal times, and on Wednesday afternoons in the playfield; and on Friday mornings brothers and sisters see one another."

GENERAL OBSERVATIONS.

The particulars of these several institutions, as affected by the Influenza epidemic, are shown in tabular form below.*

It will be seen—

1. That at those in and near London the epidemic, as a rule, occurred in January, beginning in the early part of that month, and being over in most by its close.
2. That nevertheless neighbouring institutions were not necessarily attacked at the same time. Thus, King Edward's Schools were attacked a fortnight later than other institutions in and near London, and the asylum at Winson Green, Birmingham, a month later than the prison which adjoins it.
3. That in the same institution inmates of different sexes were often attacked at different dates, the intervals ranging up to one or two weeks. As a general rule male inmates were attacked before females.
4. That the proportion of the inmates proper attacked has varied greatly in institutions of different kinds; but has been not dissimilar in institutions of similar kinds. It has been high in industrial and reformatory schools,† and in training ships; but has been low in prisons and lunatic asylums.
5. The duration of the epidemic has, generally speaking, varied inversely as its severity, it having attained its full development most quickly, and declined soonest in training ships and industrial schools,‡ while in prisons and lunatic asylums its course has been more lingering. The severity and the rapidity of development of the epidemic appear to depend upon the opportunities which the inmates have of coming in contact one with another.
6. The staff at lunatic asylums were attacked in much larger proportion than the patients; at schools and prisons (*i.e.*, in institutions for healthy inmates,) the officers were affected sometimes more, sometimes less, numerous than the inmates. In a good many institutions the earliest cases of Influenza occurred among the staff.

* The Western Fever Hospital is not included in this table as it can hardly be said that Influenza prevailed as an epidemic there.

† In a Reformatory in the New Forest district 75 out of 90 boys, or 83 per cent., are reported to have suffered,

‡ The Kerrison Reformatory may seem at first sight an exception, but it will be seen that all the cases except two came within a period of 10 days.

Institution.	Locality.	Dates of				Per Cent. attacked.		
		First Case Influenza.	Marked Rise in Number.	Greatest Number in One Day on	Last Case commenced.	In-mates proper.	Staff.	
Forest Gate Pauper Schools.	Forest Gate, Essex.	Nov. 29* (?)	Dec. 11	Dec. 12	Jan. 9	?	?	
S. Metropolitan Pauper Schools.	Sutton, Surrey.	{ Senior boys	Jan. 3*	Jan. 6	Jan. 8	Jan. 20	28·2	—
		{ Girls -	Jan. 7	Jan. 7	Jan. 8	Jan. 21	37·8	—
		{ Junior boys	Jan. 8	Jan. 8	Jan. 15	Jan. 22	34·9	—
		{ Infants -	Jan. 11	Jan. 12	Jan. 14	Jan. 20	31·2	—
School for Imbecile Children	Darenth, Kent	{	Jan. 6	Jan. 10	Jan. 17	Feb. 14	11·5	30·1
Asylum for Imbeciles.		{ Males -	Jan. 14*	Jan. 18	Jan. 18 & 21	Feb. 3	8·1	35·0
		{ Females -	Jan. 31*	Feb. 7	Feb. 10 & 11	Feb. 23	10·1	14·3
Exmouth Training Ship	Grays, Essex	{	Jan. 2 (?)	Jan. 4	Jan. 5	Jan. 13	about 55·0	?
Shaftesbury Training Ship.		{	Jan. 1 (?)	Jan. 2	Jan. 5	Jan. 10	51·5	100 (?)
St. Mary's Orphanage -	North Hyde, Middlesex,	{	Jan. 2*	Jan. 3	Jan. 4	Jan. 8	12·6	25·0
London Orphan Asylum.	Watford, Herts.	{ Boys -	Jan. 14	Jan. 15	Jan. 30	Feb. 14	23·2	} 12·3
		{ Girls -	Jan. 22	Jan. 22	Jan. 24 & 27	Feb. 7	26·4	
Gordon Boys' Home -	Chobham, Surrey	{	Jan. 5†	Jan. 6	Jan. 7	Jan. 15	45·0	18·8
Wandsworth Prison -	London, S.W. -	{	Jan. 1*	Jan. 2	Jan. 4 & 6	Jan. 21	18·0	22·0
Wormwood Scrubs Prison	London, W. -	{	Jan. 1*	Jan. 8	Jan. 9	Jan. 26	13·1	11·0
Pentonville Prison -	London, N. -	{	Jan. 3*	Jan. 7	Jan. 13	Jan. 30	7·6	19·2
King Edward's Schools -	London, S.E. -	{	Before Jan. 17.	Jan. 17	Jan. 20	Jan. 28	73·0	14·2
Kerrison Reformatory -	Thorndon, Suffolk.	{	Jan. 5	Jan. 16	Jan. 18	Jan. 28	77·0	?
Birmingham Prison -	Winson Green, Birmingham.	{	Jan. 7	Jan. 8	Jan. 14	Feb. 1	17·0	16·3
City Asylum -		{	Feb. 5	Feb. 6	Feb. 10	Mar. 3	10·2	38·2
Mount Edgecumbe Training Ship.	Saltash, Cornwall.	{	Jan. 31	Feb. 2	Feb. 4, 5, & 6	Feb. 11	43·0	33·3
Swinton Industrial School	Manchester -	{	Mar. 5 (?)	Mar. 5	Mar. 6	Mar. 17	29·0	30·4

* Cases had occurred among the staff previous to these dates.

† Convalescents returned to Home on January 2nd.

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Dr. Bruce Low.

CHAP. X.

Influenza
reported early
in Lincolnshire
and East
Yorkshire.

X.—NOTES OF CERTAIN INQUIRIES BY DR. BRUCE LOW.

NOTES ON INFLUENZA in LINCOLNSHIRE and EAST YORKSHIRE; by
R. BRUCE LOW, M.D.

It is noteworthy that no fewer than 10 localities* in Lincolnshire are reported to have suffered from "influenza" during November.

The earliest date given is that of "beginning of November," for Louth urban and rural districts.

Some allowance must of course be made for the difference in observers, some on the one hand being only too anxious to discover the presence of a new disease, while on the other hand, others refuse to recognize the new disease even when the place is full of it. Allowing for this, yet there must be some cause peculiar to Lincolnshire which draws the attention of at least 10 observers or groups of observers to the invasion of a new disease, and that before, so far as I know, it had been spoken of as appearing elsewhere in this country. The eastern part of the East Riding of Yorkshire (Holderness) which in many particulars resembles Lincolnshire, had at least three, if not four, places† in which "influenza" is stated to have appeared also in November (*see* rough map, opposite).

The majority of the places attacked are situated near the east coast (of Lincolnshire or Holderness), and are situated upon rising ground, or at the foot of rising ground, within 8 or 12 miles or more from the coast. Two of the localities (Caistor and New Somerby, a suburb of Grantham) are situated on the rising ground, but face westward, *i.e.* they are protected from the east by the ridge upon whose western slope they respectively stand.

Some of these localities in Lincolnshire have little or no communication with the great centres of population, and although, in some cases, apparent importation of the specific disease has been found, yet it is remarkable that in other localities, not far removed, the same disease appeared almost simultaneously without, so far as can be found, any direct importation from without. North of Filey, I have only heard of two instances in which "influenza" is reported in November, the first is at Baildon, near Bradford, near which resides a large foreign population, principally Germans, and it is reasonable to suppose that infection imported from Germany might account for this exceptional instance when no other district for miles round showed then a single case. Baildon is a small urban district built on a steep hill. The case was in a woman, a factory hand, but she lived low down in the valley. It was not till late in December that Influenza became epidemic in Baildon; one of the first recognized cases in December being a gentleman just returned from Paris. [As to Baildon, *see* page 145.]

The second instance I have had no opportunity of investigating; it is stated to have occurred at Middleton-in-Teesdale which is some distance inland, the population being engaged in mining.

* Winterton and Roxby, 1; Barton, 2; Cleethorpes, 3; Caistor, 4; Louth, 5; Alford, 6; E. Keal, 7; Boston, 8; Donington, 9; Grantham, 10 (New Somerby).

† 1, Patrington; 2, Langtoft; 3 Filey; 4, Muston.

[In the county summaries, given on pp. 120-151, it will be found that the date of the first observed cases of Influenza in 1889 is given as in or before November in 36 districts in England and Wales, viz., in Lincolnshire, 10; Yorkshire, West Riding, 5; East Riding, 2; North Riding, 2; Durham, 3; Cheshire, 2; London, 2; and Sussex, Hants, Berks, Middlesex, Essex, Gloucester, Stafford, Warwick, Nottingham, and Lancashire, 1 each. In most of these districts, however, either the cases were solitary or scattered ones, not followed by an epidemic until a good deal later, or they do not appear from the description given to have been genuine Influenza.—H. F. P.]



South of Lincolnshire I have no information of cases in Norfolk or Suffolk in November. In Norfolk two or three districts are said to have been invaded in December, but the bulk of the county seems not to have suffered till January. Northants, to the south-west of Lincolnshire, also seems to have become infected in December, and there are many circumstantial accounts of importation of infection from London during that month.

Roughly speaking, the annexed map show that a line, marked red, of localities was attacked in Lincolnshire in November, and that a second line, marked green, immediately behind the first was invaded in December, due apparently to the spread from the first localities westward and to the others.

In connexion with the suggestion that the contagion might have been borne by the wind across the sea, and have from certain circumstances been directed towards the low coasts of Lincolnshire and Holderness, a well-known naturalist, Mr. Cordeaux, residing near Grimsby, has informed me that last summer millions of dragon flies were blown across from the Continent to the Lincolnshire coast and Spurn Point. Sometimes locusts are blown across in the same way, also aphides and butterflies.

Migrating birds, it has been suggested, may have brought the specific poison with them. In October and November countless hosts of birds reach the Lincolnshire coast from Central Europe as far east as the Ural mountains and the Sarmatian plains. Birds do not always fly with the wind, their line is E. to W., sometimes a point S. of E. The great autumnal rush of these birds (larks, starlings, rooks, daws, &c.) takes place usually about the end of October to the middle of November. The reports from the lightships and lighthouses concerning the dates of the great rushes of last October and November gave no help in solving this point under consideration.

Mr. Cordeaux says pigeons have been known to carry rinderpest from one place to another.

A suggestion too has been made that Influenza is a malarial disease, and that after accidental importation in any way the poison would gain or lose power according to the soil in which it was implanted.

In Lincolnshire malaria was formerly common. The arrival in that county, even of a wind-carried contagion, would be attended with a probably greater prospect of development of power than if the poison had fallen on a bare and rocky shore. In this connexion I was informed that a disease almost identical in its characters with Influenza has been met with for some years in a locality on the borders of Somerset and Dorset where these counties adjoin. Wincanton, where my informant had been assistant, was named as situated in such a district. The district was said formerly to have had ague endemic in it, and the disease of which my informant spoke was said to have been "malarial" in its nature.*

* In the district in which I formerly practised in East Somerset, about 16 miles from Wincanton, "influenza" was a term in common use, both popular and medical, as applied to a febrile catarrh with feelings of chilliness and depression. On looking through my case books of that period, however, I can find no record of any case with the intense frontal headache, pains in the eyeballs and muscles, or other symptoms like the epidemic Influenza of 1890. Ague was unknown there, though it formerly existed in the flat parts of Somerset. My former district and Wincanton are similar as regards physical circumstances, the surface being steeply undulating, and the geological formation oolitic limestone (forest marble).—H. F. P.

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CHAP. X.

Communications
between Lincoln-
shire and the
Continent.

As to the IMPORTATION of CONTAGION from the CONTINENT.

The following remarks apply to the possibility of importation of contagion from the Continent into Lincolnshire, where my inquiries were chiefly made.

The two ports in Lincolnshire are Grimsby and Boston. The latter may be quickly dismissed as the trade is almost confined to a bi-weekly steamer from Hamburg. Further, it is stated (though I have doubts regarding this) that there has been no epidemic Influenza at Boston, nothing more than the ordinary coughs and colds of the winter season. The ordinary steamer traffic between Grimsby and the Continent is confined to the ports of Hamburg, Antwerp, Rotterdam, Dieppe, and Rouen. There are four steamers each way between Hamburg and Grimsby weekly; two a week either way between Grimsby and the ports of Antwerp, Rotterdam, and Dieppe; and about one a week to Rouen. The port sanitary inspector to whom I applied for information told me of cases of Influenza having occurred on board steamers arriving, or just after arrival from Dieppe (January 18th), Rotterdam (January 16th), and Hamburg (December 23rd). In addition to the ordinary sailings there are cargo steamers and ships passing to Grimsby from continental ports. But in only one of these did the port sanitary inspector hear of Influenza, and that ship had been 11 days in Grimsby port unloading.

There is some amount of trade done in conveying horses and ponies from Hamburg and Rotterdam to this country. The ponies are called Russian ponies, they are bought at Hamburg and shipped from there to Grimsby, and upon arrival are sent at once to Manchester or Sheffield. From Rotterdam horses are sent over of a sort suitable for funerals.

Occasionally the horses sent to Grimsby from the Continent are found ill on arrival. Mr. J. B. Gresswell tells me for instance that he was sent to Grimsby by an insurance company to make a post-mortem examination of the body of a horse which died on being landed in July 1888. Mr. G. said the horse had died of "influenza." I am unable to learn whether the ponies spoken of above are really from Russia or not. A consignment of them was landed towards the end of 1889, but I could not learn the precise date.

The Medical Officer of Health for Grimsby says that Influenza did not begin to spread there till the latter part of December. The port inspector says it was pretty well established by the 23rd of that month. The Medical Officer of Health for Cleethorpes, which is close to Grimsby, says he heard of cases about the middle of November. It is more than probable that at first the disease was mild in its character and escaped notice for a time till its increased virulence (developed by the season and by local conditions) caused it to become more widely known and recognized. The milder cases may date back before November, but this is of course only surmise.

From Grimsby the eastern parts of Lincolnshire may have been infected. There is a busy and well-attended weekly market at Grimsby. There is a cattle fair too in October. Fish hawkers from Grimsby take carts weekly round to the adjacent towns and villages as far as Louth and Caistor. There might be by these means of intercommunication opportunities for introducing the specific poison of Influenza to the other parts of Lincolnshire from Grimsby, where opportunities of importation of the disease were numerous.

The large fishing fleet which sails from Grimsby to the Dogger and elsewhere might have contracted the disease by contact with foreign fishermen, and brought back the contagion with them. An inquiry however made by printed forms supplied to smackowners of other places besides Grimsby has yielded negative results (*see* page 94).

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CHAP. X.

The METHODS by which INFLUENZA once introduced into this Country has spread from place to place or from person to person.

Generally speaking, places where people have congregated breathing the same atmosphere have diffused the disease, the sick or convalescent yielding the contagion to the air, afterwards breathed by the healthy.

Methods of
spread of
Influenza.

Churches, chapels, theatres, parties, and schools have all to some extent aided the spread of Influenza.

Public-houses have apparently helped to spread the disease. In two village outbreaks the first person known to be attacked was the innkeeper. Some rural practitioners have noticed a number of labouring men apparently attacked at the same time. In the absence of other reasons, it is not unlikely that the nightly assembling of these rustics to drink beer and discuss the news of the day, would give a favourable opportunity for a general infection, if someone suffering from the disease, *e.g.*, the innkeeper himself, or some traveller, were present during the evening.

Medical men and their families have suffered in great proportion, and some of these may have innocently spread the ailment while struggling against the effects of the disease. Nurses, too, have been frequently attacked. Clergymen and their families have been attacked in large proportions in the country districts, owing to their visiting at infected houses, and may have also assisted in the spread.

I met with no facts bearing on the spread or importation of the disease into new localities by means of infected clothing or other articles, but this is a very probable mode of infection. As we have some information of the spread of Influenza by schools, I propose to give one or two examples later.

INFLUENZA at EAST KEAL, in the SPILSBY R.S.D.

East Keal is a small village, $2\frac{1}{2}$ miles from Spilsby. It is situated on a steep acclivity, which rises somewhat sharply to a height of about 300 feet above the flat fen,* which extends due south for about 14 miles. The coast line lies due east of the village, some 10 miles off, the intervening country being flat. East Keal is therefore exposed to the full sweep of the wind to the east and from the south. About half-a-mile due west lies West Keal, also on the acclivity, and about a mile and a half to the north-west is the village of Bolingbroke. The country north and west of East Keal is hilly.

Influenza at
East Keal.

The population of East Keal numbers about 300, and the inhabitants are almost altogether engaged in agricultural pursuits. The cottage property is of a superior kind to that usually met with. There are garden privies to each house, and each cottage generally possesses a well,

* It must be borne in mind that the "fens" are now well-drained and highly-cultivated tracts of land, yielding large crops of cereals and other produce. There is no trace of marsh or swamp. Large open "dykes" convey the surface water to the coast.—R. B. L.

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dug in the sandstone, of which the high ridge is composed. There is no systematic drainage of the village. There is not much connexion with the outer world. A few persons occasionally attend the weekly market at Spilsby, or at Boston, 14 miles away.

Influenza became epidemic in East Keal in the first week in December, and not long after the disease was also very prevalent at West Keal and Bolingbroke.

The following is believed to have been the commencement of the outbreak, and for these facts I am indebted to Dr. Francis Walker, Medical Officer of Health, Spilsby R.S.D. Mrs. N., residing at East Keal Hall, went to London (Forest Hill) on a visit on November 11th. She visited Barnum's Show on November 13th.* She became ill on the night of November 14th. Her symptoms were those of a cold, attended with sorethroat. No one else so far as she knew was ill in this way in the house before her. She left Forest Hill on November 16th, still feeling very unwell, and went to stay with friends at Kensington. She was too ill to return home till November 23rd, at which time she was still feeling very weak. She heard from Forest Hill that, directly after she left, one of the inmates of the house where she had been visiting fell ill with symptoms similar to her own. Within a few days, probably about the 27th November (the exact date is not fixed), of her return home, her son, aged 4, became unwell with what appeared to be an ordinary cold, but the child had epistaxis; he soon recovered, but during the next fortnight the four servants in the house were ill with what were said to be "colds," one of them also had epistaxis. On January 2nd another son, aged 6, was ill with "cold" for a few days; he went out and had a relapse, which compelled him to stay in the house for another week.

On January 3rd, Mrs. N. again fell ill with "a bad cold," attended with headache, backache, and epistaxis. She was in bed two days and felt miserable and prostrate for more than a week after. On January 5th, Mr. N., her husband, had headache, backache, and general soreness "all over." On January 10th, the boy aged 4, who was first attacked after his mother's return from London, again became ill, his symptoms being the same as before. The only other remaining member of the family, who had managed to escape an attack of "cold" up to this date, was said to have felt ill the day the boy had his second attack; but the illness of this individual was slight, and only caused suffering for one night. Thus between the return of the mother on November 23rd and January 10th all the inmates of this house, nine in number, had an attack of illness, evidently of the same nature. A boy who works in Mr. N.'s yard was taken ill with Influenza about the end of November. He lives in the village. After his illness his four brothers also were ill. Dr. Walker says that "about the end of November" cases of like illness were beginning to crop up in East Keal. Mrs. W., the wife of the village grocer and baker, who waited on customers in the shop and never left the shop or house, was taken ill on the afternoon of November 30th. Next morning, December 1st, her husband and six children were all attacked in the same way with what is now recognised to have been marked Influenza. The only inmate of the house who escaped was a youth employed to deliver bread and groceries in a cart in the neighbouring villages.

* I have met with several instances where the patient referred his illness to a recent visit to Barnum's Show, then exhibiting at "Olympia," Kensington.—R. B. L.

On December 1st the rector's wife, accompanied by a young lady visitor, called at the baker's house and saw Mrs. W. and family. Both ladies were taken ill with Influenza on the night of December 3rd. There are four servants at the rectory, one male and three females, two of the latter became ill about December 16th. The rector himself took the disease on December 25th.

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During the first two weeks of December Influenza was epidemic in East Keal.

At West Keal, the adjoining village, and at Bolingbroke, only a mile and a half distant, cases began to occur in fair numbers about December 9th, and by the 17th Influenza was epidemic in both villages. The rector of West Keal contracted the ailment, he says, while visiting a family in the village, where several cases had occurred. The rector's wife and daughter, his maid servant, and his man servant (who did not live at the rectory) all took Influenza one after the other. The man-servant's wife and family also took the disease after him. The clergyman's groom had been at East Keal, and a convalescent young man had cut the groom's hair on December 14th. He became ill on the 15th. At Bolingbroke the ailment was general about the middle of December, the first ascertained cases began about December 8th. The schoolmaster says there was a lot of bleeding at the nose among the children during December. The infant teacher told me of six infants out of 30 who had had epistaxis. But "nobody had a doctor" at Bolingbroke, and the dates of cases are somewhat uncertain. The log book on December 13th states that "the attendance was thin, many children ill." The school register shows that 30 children out of an average daily attendance of 69 were absent on December 9th, but the weather, it must be admitted, was unfavourable on that day. Going further away from East Keal, northwards, it was found that the villages of Raithby and Mavis Enderby, respectively $1\frac{1}{2}$ and $2\frac{1}{2}$ miles from Bolingbroke, had suffered comparatively little from Influenza. And also that Spilsby, due east from Keal, and the central place of the district, between which and the infected villages there must of necessity have been much communication, appears to have suffered but slightly. Dr. Walker, after conferring with his medical brethren in Spilsby says that although colds and coughs were numerous in December, yet few cases occurred to suggest that some epidemic disease had arrived and was spreading in the town. He admits that probably some cases of true Influenza occurred there in the first week of December.

and neighbour-
ing villages.

At East and West Keal, cases of horse-influenza had been occurring since August 1889, when the disease was imported by horses purchased at Horncastle fair, which is held in that month. One farmer is stated to have had 40 horses ill with "influenza" in the autumn months, but none of his men who waited on the sick horses developed the disease or anything like it at the time, though many of these men had the human variety of the illness in December.

(1.) Through the kindness of Dr. Walker I am able to append the observations taken daily on the direction of the wind (at 9 a.m. each day) at Spilsby for November, December, and January. So far as these limited meteorological data go, they do not give countenance to the contention that infection might have been, in the first instance, brought by the wind blowing over tracts of country in north Europe affected by the disease, and that the wind-borne contagion, passing over without mischief the low-lying lands on the Lincolnshire shores, struck the first bold elevated region it came in contact with, to wit, the sudden acclivity of sandstone which rises from the fen at East Keal. In this connexion it may be well to mention that other places upon high ridges, or situated

Hypotheses
discussed of
origin in
wind-borne
miasm.

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just below ranges of hills facing the east, had been attacked by Influenza in Lincolnshire, and at least at one place in Yorkshire during November. These places were Louth, Caistor, Barton-on-Humber, and New Somerby (a suburb of Grantham). In Yorkshire, Langtoft is the place referred to. As already stated the records of the direction of the wind during October and November taken at Spilsby do not support this theory. I have appended a return of the force and direction of the wind observed at Grimsby during November and December: and the report for Grimsby does not lend itself to this theory either.

OBSERVATIONS ON DIRECTION of the WIND taken each Day at
SPILSBY at 9 a.m. by DR. FRANCIS T. WALKER, M.O.H.

—	November 1889.	December.	January 1890.
1	S	SW	SW
2	SW	S	SSW
3	SSW	SE	SE
4	W	N	S
5	SW	N	S
6	WSW	E	S
7	SW	S	S
8	NW	WNW	S
9	W	SW	SW
10	NW	SW	SW
11	NW	WNW	SW
12	S	SW	SW
13	SE	SSW	SW
14	SW	NW	SW
15	SW	SSW	W
16	SW	SW	SSW
17	NE	SW	S
18	S	SW	SW
19	SSE	SW	SW
20	S	S	SW
21	S	SW	SW
22	SW	SW	SW
23	N	W	SSW
24	SW	S	SW
25	W	NW	SSW
26	W	SW	W
27	NW	ESE	W
28	NW	SE	SE
29	WNW	SW	NW
30	SE	NE	W
31	—	SSE	NW

FORCE and DIRECTION of WINDS noted at GRIMSBY.

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November 1889.			December 1889.		
Date.	Direction.	Force.	Date.	Direction.	Force.
November 1	SSW	4	December 1	SSW	2
" 2	WSW	4	" 2	WSW	2
" 3	WSW	1	" 3	S	2
" 4	SW	1	" 4	WNW	1
" 5	WSW	4	" 5	NE	1
" 6	WSW	1	" 6	N	1
" 7	WSW	2	" 7	SW	1
" 8	W	2	" 8	SW	1
" 9	SW	2	" 9	SW	6
" 10	W	1	" 10	WSW	6
" 11	W	1	" 11	SW	4
" 12	S	2	" 12	W	4
" 13	SSE	1	" 13	SSE	6
" 14	WSW	1	" 14	NW	2
" 15	SW	1	" 15	SW	2
" 16	S	2	" 16	SW	2
" 17	WSW	1	" 17	SW	2
" 18	SE	1	" 18	SW	4
" 19	SW	2	" 19	WSW	2
" 20	SSW	1	" 20	SSW	4
" 21	S	1	" 21	WSW	4
" 22	SW	1	" 22	SE	4
" 23	WNW	2	" 23	W	2
" 24	SW*	2	" 24	W	2
" 25	SSW	5	" 25	W	6
" 26	NW	5	" 26	SW	4
" 27	WNW	5	" 27	SSW	2
" 28	N	6	" 28	WNW	2
" 29	W	2	" 29	NW	2
" 30	SW	1	" 30	NE	2
			" 31	S	2

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(2.) Some persons have suggested that the vicinity of East Keal to Malaria the fen country may have favoured the evolution of some endemic or imported (no matter in what way) poison from which, by gradual stages, this poison has become communicable to man. The fen country, as already stated, is now a well-drained and highly-cultivated tract of country. Ague, once common in these parts, is now unknown. Still it is suggested that the specific malarial poison may still live in the soil, though robbed of its power for evil. Whatever grounds there may be for this opinion, no satisfactory evidence was obtained at East or West Keal in favour of it.

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Horse-influenza.

Imported
contagion.

(3.) "Influenza" among horses, as already stated, was rife in the locality from August last. No evidence, however, of transference of the disease (if indeed it be the same) from the horse to man was found. Still it is worth bearing in mind that this epidemic disease prevailed among horses before it was prevalent among human beings in this neighbourhood, just as it is reported to have been in London and in some other Lincolnshire districts (*e.g.*, Louth, Caistor, and Barton-on-Humber). At present there is no evidence in the Keal outbreak to show that the environment of the horse-influenza contagion caused a change or further development of its virulence to enable it to affect man. But this possible explanation cannot lightly be dismissed.

(4.) It may be asserted that there is no reason to argue respecting conflicting theories, when so ready an explanation is at hand in the evidence supplied regarding direct importation of the contagion by Mrs. N. from London to East Keal.* There are certainly grounds for believing that Mrs. N.'s illness was Influenza, and that on her return the disease seemed to spread at first among those in contact with her. In explanation of the occurrence of Influenza in the wife and family of Mr. W., the village grocer and baker, it is to be remembered that an almost daily intercourse took place between his house and Mrs. N.'s either (1) by Mr. W. himself visiting Mr. N.'s house for the purpose of getting orders, or (2) by goods being delivered at Mr. N.'s house by Mr. W. or his messengers, or (3) by Mr. N.'s servants going to the shop for articles needed.

Although the importation of the disease from London to East Keal, and its gradual spread to West Keal and Bolingbroke, are apparently explained, yet it must not be lost sight of, that Influenza appeared also in November in so many other Lincolnshire places, extending from Barton-on-Humber on the north to Grantham on the south-west of the county.

We might suppose in each of these instances that infection was imported from London or abroad in the same way, and that by careful inquiry proof of this might have been found. While this is not denied, yet we must imagine that many other localities north, south, east, and west of London, to which visitors to and from the latter place would be going and returning during November, did not take with them this contagion, for there is no report of widely scattered Influenza in England in November, but that by a coincidence Lincolnshire, and especially that part which faces the east, should almost alone have suffered by this importation of infection.

NOTES ON INFLUENZA IN SCHOOLS (NOCTON).

Influenza at
Nocton

Nocton (Lincolnshire); population 600. About 9 miles from Lincoln.—The first cases of Influenza appeared in this village about the 18th of December. The earlier cases seem to have been labourers, the disease afterwards spreading to their families. In some houses ultimately everyone was attacked.

The village school has an average daily attendance of 67. On December 20th, the school was closed for the Christmas holidays. Up to that date (December 20th) no cases of Influenza had been heard of in children, in fact it was not then known that Influenza had reached the village. On the evening of December 26th, an annual treat called

* A difficulty in the way of this hypothesis is that, so far as known, Influenza was not present, certainly not as an epidemic, in London, so early as the middle of November.—H. F. P.

the children's play (a kind of performance) was given in the school-room. The master noticed that one or two of the children went to sleep during the evening and took no interest in the performance, contrary to their usual habits. The school opened on Monday December 30th with an attendance of 74. Next day, December 31st, the number present was 63; on January 1st the number present was 61; on January 2nd the number present was 45, and as a number of the 45 present appeared ill, the school was closed for 11 days.

The teacher remembers three children, all members of one family, coming to school on Monday, December 30th. They seemed so ill he sent them home. There was a great deal of coughing in school on the succeeding days.

On the Tuesday and Wednesday he noticed several children ill and unable to do their lessons, shivering, stupid, and miserable. On Thursday, January 2nd, many of those assembled (out of the 45) seemed so ill that it was impossible to do lessons, and he dismissed them all.

The school re-assembled on Monday, January 13th, with an attendance of 75, and this average was maintained during the whole of that week. The numbers have since kept up to the standard and there has been no illness among the children. The teacher says almost every child attending the school had Influenza.

On resuming work on January 13th, he noticed several of the scholars with an eruption about their lips. And some 10 days later I myself saw six or more cases in school with traces of herpes about the mouth and lips.

In regard to the first cases in the village, there was a history of importation of infection from London. An old man died; one of his sons living in London (Lambeth Walk), a temperance lecturer, &c., came to the funeral on December 17th about noon. The following afternoon his brother, with whom he was staying, became ill, and within a few days, his (the brother's) wife and family; and during the following week several houses were attacked in the same row, and to each of which the temperance lecturer had been paying visits, spending his evenings, and so on. Although this man from London had a bad cough on his arrival at Nocton, he was otherwise well. He did not take Influenza, although he remained a fortnight in the village, and notwithstanding that his relations and friends were almost without exception attacked. It may be said the London visitor brought the disease to Nocton. But on the other hand, cases of Influenza had appeared at Lincoln just before this, and there were other villages not far off attacked, where no importation could be traced. The spread of the disease among the school children seems to have been accelerated by their assembly together on December 30th. For within the next four days (the incubation period being rarely beyond four days, but usually less) the whole school seems to have caught the disease. Sufferers from Influenza were among those who came to school on December 30th.

The children's treat on December 26th had also without doubt a share in diffusing the disease, as children developing the ailment were present on that occasion. Several of the children became anæmic after their attack.

I did not hear of any special incidence of horse-influenza upon Nocton at the time, or before the appearance of human Influenza there, but the horse-influenza had been more or less prevalent round about for months in adjacent districts.

In the adjoining village of Blankney (3 miles off) the human ailment and Blankney. began about the same time, the first sufferer being a farmer, a strong

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robust man, who two days before had attended a stockmarket at Lincoln, where mild cases are said to have been occurring. Several nurses at the hospital had it between December 14th and 22nd. It is probable that Nocton, like Blankney, was infected from Lincoln, which is the marketing centre for the surrounding district.

NOTES ON INFLUENZA in the NEW SOMERBY SCHOOL, GRANTHAM.

Influenza at New
Somerby

The town of Grantham lies in a hollow, bounded on the west by the Great Northern Railway and on the east by a ridge which runs due north and south. New Somerby is a suburb and is built on the slope of the ridge and faces due west. The ridge rises nearly 100 feet higher behind the houses. New Somerby stands on the sands and clays of the upper lias, below the Northampton sands. The New Somerby suburb overlooks Grantham which lies in the hollow. The population of New Somerby is largely artizan. An agricultural implement factory in Grantham employs some 2,000 hands, many of whom live at New Somerby. The schoolmistress tells me she has been struck with the amount of frequent flitting among a certain class of the workpeople, and as soon as one lot leaves the town, another lot seems to come to take their places.

Influenza was not recognized to have occurred at Grantham till the middle of December, but New Somerby suffered earlier.

So far as can now be ascertained the school children at New Somerby suffered severely.

About the middle of November a boy was sent home from school suffering from what was called mumps, but so far as could be learned this disease (mumps) was not "about" at this time. It is probable that this case was one merely of enlarged glands due possibly to Influenza; the same sort of thing has been reported elsewhere. In the week ending November 22nd, the schoolmistress began to notice children looking ill in school and she sent some home. She herself had an attack of Influenza on November 30th, and through coming back to school too soon she had a relapse on December 6th.

On the school assembling on Monday, December 9th, so many children were absent from illness that the school was closed. The following shows the school attendance: average daily attendance for the past year, 187.

Daily attendance for week ending	November 8th	-	178·8
	"	"	15th - 187·6
	"	"	22nd - 165·6
	"	"	29th - 176·2
	"	"	December 6th - 147·3
	"	"	- - - 90
Present on	December 9th	-	-

On this day only two teachers attended out of the seven employed, the other five being ill.

Looking back at the cases the schoolmistress is of opinion that two of her assistant teachers were among the first to be attacked. Their illness occurred in the week ending November 8th, but no satisfactory information could be got to account for their attack.

On the 16th of November, she states, the attendance at the Sunday school, of which she was also a teacher, was small. After this date, she noticed cases of illness running in families, one after another would suffer. But towards the end of November and beginning of December the cases seemed to multiply. Children in school seemed dizzy and feverish, some were sick, some had epistaxis, some complained of their

COPIED from METEOROLOGICAL REGISTER kept at GRANTHAM, 1889.

Month and Date.	Wind.	Thermometer.		Month and Date.	Wind.	Thermometer.		Month and Date.	Wind.	Thermometer.		Month and Date.	Wind.	Thermometer.	
		Max.	Min.			Max.	Min.			Max.	Min.			Max.	Min.
1889.															
May 1	S	58	43	July 1	E	76	55	September 1	NE	71	50	November 1	W	50	38
" 2	SE	59	41	" 2	NE	72	53	" 2	E	68	57	" 2	W	49	37
" 3	S	61	45	" 3	NE	70	55	" 3	NE	63	56	" 3	SW	50	45
" 4	S	61	47	" 4	NE	74	56	" 4	NE	64	54	" 4	NW	50	32
" 5	E	71	45	" 5	NE	78	48	" 5	NE	64	53	" 5	SW	47	37
" 6	NE	71	46	" 6	W	77	57	" 6	NE	69	52	" 6	W	51	39
" 7	NE	69	51	" 7	NW	68	46	" 7	N	70	52	" 7	W	56	44
" 8	S	66	46	" 8	W	68	47	" 8	N	70	52	" 8	NW	54	44
" 9	SE	69	49	" 9	SE	71	58	" 9	SE	78	57	" 9	NW	55	43
" 10	SW	63	47	" 10	SE	67	53	" 10	SW	84	57	" 10	NW	55	47
" 11	NW	53	47	" 11	W	72	56	" 11	W	69	59	" 11	NW	53	45
" 12	N	53	47	" 12	ENE	72	57	" 12	NW	83	57	" 12	SE	51	33
" 13	N	53	43	" 13	NE	64	53	" 13	NW	74	53	" 13	SE	47	33
" 14	N	54	45	" 14	NE to NW	66	52	" 14	N	62	48	" 14	SE	50	41
" 15	NE	59	45	" 15	W	68	48	" 15	NE	60	47	" 15	SW	58	45
" 16	NE	67	47	" 16	NW	65	45	" 16	N	62	46	" 16	NW	54	43
" 17	NE	67	50	" 17	NW	67	47	" 17	SE	63	38	" 17	NE	52	44
" 18	SE	68	51	" 18	NW	61	46	" 18	SW	64	47	" 18	SE	52	44
" 19	NE	60	48	" 19	SW	67	51	" 19	W	55	42	" 19	SE	49	39
" 20	NE	72	47	" 20	S	67	56	" 20	NW	54	37	" 20	S	46	37
" 21	NE	69	52	" 21	SW	67	49	" 21	NW	52	37	" 21	SW	44	34
" 22	NE	76	54	" 22	SW	64	48	" 22	NW	53	36	" 22	SW	51	41
" 23	SE	72	59	" 23	S	67	43	" 23	W	54	45	" 23	NW	49	43
" 24	SE to SW	72	54	" 24	SW	63	53	" 24	SE	52	36	" 24	SW	51	39
" 25	NW	59	49	" 25	NW	65	51	" 25	NW	53	37	" 25	SW	44	31
" 26	NE	55	47	" 26	N	61	52	" 26	W	59	45	" 26	NW	38	27
" 27	NE	55	48	" 27	N	67	50	" 27	W	63	48	" 27	NW	36	27
" 28	S	63	47	" 28	NW	66	55	" 28	NW	57	43	" 28	NW	35	28
" 29	SW	64	46	" 29	NW	68	54	" 29	W	54	44	" 29	W	40	35
" 30	SW	64	47	" 30	SE	73	56	" 30	NE	53	42	" 30	S	42	28
" 31	S	67	46	" 31	SE	76	56	" 31				" 31			
1890.															
January 1	SW	38	23	August 1	SW	76	57	October 1	NE	55	45	December 1	S	38	25
" 2	SE	35	21	" 2	SW	73	56	" 2	NE	55	42	" 2	S	32	24
" 3	SW	38	30	" 3	SW	75	55	" 3	E	55	34	" 3	SE	33	25
" 4	SW	48	38	" 4	W	72	56	" 4	NW	53	39	" 4	E	37	31
" 5	SW	54	42	" 5	W	71	51	" 5	SW	54	44	" 5	NE	39	32
" 6	SW	54	43	" 6	W	66	52	" 6	SW	54	48	" 6	NE	39	31
" 7	SW	54	44	" 7	W	65	50	" 7	W	54	41	" 7	NW	37	27
" 8	SW	54	44	" 8	W	70	54	" 8	SW	54	39	" 8	W	44	30
" 9	SW	53	37	" 9	SW	64	48	" 9	SW	55	37	" 9	W	50	41
" 10	SW	47	34	" 10	W	65	49	" 10	SW	55	32	" 10	NW	46	32
" 11	SW	51	36	" 11	NE	69	50	" 11	SW	49	35	" 11	NW	35	28
" 12	NW	48	34	" 12	N	60	51	" 12	NW	53	41	" 12	W	41	30
" 13	NW	50	33	" 13	NW	62	52	" 13	N	54	33	" 13	S	43	29
" 14	NW	51	36	" 14	SW	61	55	" 14	NW	52	35	" 14	W	38	29
" 15	NW	51	36	" 15	W	68	51	" 15	S	54	42	" 15	W	43	30
" 16	NW	51	36	" 16	SW	73	59	" 16	S	58	44	" 16	W	50	39
" 17	NW	51	36	" 17	NW	70	50	" 17	S	55	41	" 17	W	53	46
" 18	NW	51	36	" 18	W	67	53	" 18	SE	53	45	" 18	SW	52	31
" 19	NW	51	36	" 19	SE	71	57	" 19	SE	53	40	" 19	SW	44	33
" 20	NW	51	36	" 20	WNW	63	50	" 20	SE	51	42	" 20	W	46	32
" 21	NW	51	36	" 21	SW	65	51	" 21	SE	53	43	" 21	W	50	37
" 22	NW	51	36	" 22	NW	60	46	" 22	NE	53	45	" 22	W	51	41
" 23	NW	51	36	" 23	W	60	49	" 23	NE	50	39	" 23	SW	49	40
" 24	NW	51	36	" 24	NW	60	48	" 24	NE	50	38	" 24	SW	51	41
" 25	NW	51	36	" 25	NW	57	48	" 25	NE	48	37	" 25	SW	48	39
" 26	NW	51	36	" 26	NW	60	46	" 26	NE	49	39	" 26	W	51	40
" 27	NW	51	36	" 27	NW	62	51	" 27	NE	48	40	" 27	F	40	30
" 28	NW	51	36	" 28	W	68	48	" 28	NE	51	45	" 28	NW	34	21
" 29	NW	51	36	" 29	W	74	49	" 29	SW	54	40	" 29	NW	35	29
" 30	NW	51	36	" 30	W	75	50	" 30	SW	53	40	" 30	SW	35	24
" 31	NW	51	36	" 31	NE	70	57	" 31	SW	51	39	" 31	SW	35	25

Table 1. [Illegible title]

[Illegible]	[Illegible]	[Illegible]	[Illegible]	[Illegible]	[Illegible]
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throats, others had cough. Some children could not be prevented from lying down on the benches. All appeared stupid, and unable to understand their lessons. Many appeared weak, and could scarcely sit up or walk.

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The school was closed from the 9th to the 30th December. On re-assembling, 150 pupils were present, and there has to the present time been no diminution.

From what I learned at New Somerby, it looked as if at first the amount of infectiveness in the ailment was not great. At first it seemed to run in families, but later on it became very infectious, attacking teachers and scholars, all in fact breathing the same atmosphere in the school.

On comparing the attendance at the other public elementary schools in Grantham no similar outburst of the disease was so well marked.

At the National Schools, Spittlegate, during the week ending December 13th, the boys showed a diminution of nearly 44 (out of an average daily attendance for the last completed year of 250). The girls in the same week showed a decrease in the daily attendance for the same week of about 21 (out of an average 221), while the infants showed a larger attendance, viz., 217, than the daily average for the last year which had been 197 (*see table appended*).

TABLE showing COMPARISON of AVERAGE ATTENDANCES at the PUBLIC ELEMENTARY SCHOOLS in GRANTHAM and NEW SOMERBY for Six Weeks ending December 6th, 1889.

—	New Somerby School.	Grantham National School.	National Schools, Spittlegate.		
			Boys.	Girls.	Infants.
Number on the books - - -	250	291	310	282	262
Average daily attendance for last completed year.	187	252	250	221	197
Average daily attendance for week ending Nov. 8	178·8	264	274	253·2	236·3
" " " " 15	187·6	260	262·8	251·4	231·3
" " " " 22	165·6	245	263·4	247	233·6
" " " " 29	176·2	242	265·3	241·8	241·2
" " " Dec. 6	147·3	246	247·6	194·2	235·8
" " " " 13	{ 90 only pre- sent on Dec. 9. School closed till Dec. 30. }	229	216·4	199·5	217·2
" " " " 20*		210	212	202	210

* December 20, closed for holidays.

The headmaster of the Spittlegate Schools was aware that Influenza was in Grantham early in December. He says that he believes that more than half his scholars have had it, but that probably the closing for the Christmas holidays allowed it to pass over without affecting much the daily average attendances. In answer to my inquiries, he says that his teachers noticed some cases with enlarged glands in the neck. Some became rather deaf for a time (an experience I can personally confirm). Apathy and dullness of apprehension lasted some time after all other traces of illness had disappeared.

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At the other National School in Grantham the headmaster says that during the two weeks ending December 6th and 13th there were 51 boys, out of an average attendance of 252, marked absent from illness, but he cannot say of what nature the illness was. For comparison of attendances, *see* table above.

Inquiries made among medical men in Grantham show that the disease was epidemic there about Christmas.

No evidence can be obtained of marked previous prevalence of horse-influenza, but cases of "influenza" in horses were treated in January, and sporadic cases are said to have occurred during the autumn.

One veterinary surgeon says he has had, during the winter, a prevalence of cases of coughs and colds, especially among hunters, in the immediate vicinity of Grantham.

A considerable export trade in agricultural machinery is carried on at Grantham, and foreign buyers frequently visit the town to give orders, or inspect articles. While I was staying (one night) in Grantham, I came in contact at the hotel with two Germans, one of whom had arrived that day from Frankfort. There is this possibility, that the specific infection had been brought to Grantham from abroad in the first instance. Its earlier and more severe incidence on New Somerby children is hardly explained. But it might be from the fact that a large proportion of the inhabitants were engaged at the factory, and therefore, if the disease spread from that place, more of it reached New Sowerby than Grantham itself, at least to begin with. But on the other hand there is the fact that in November Influenza had also invaded other localities of a purely agricultural kind, such as Caistor, Alford, and East Keal, and in these cases no ascertained connexion with foreigners could be found (although at East Keal a visitor returning from London appears to have introduced the disease there, as before mentioned).

[Some meteorological data from Grantham supplied by Mr. Gamble, borough surveyor, are appended.]

INFLUENZA at LANGTOFT (DRIFFIELD R.S.D.).

at Langtoft.

Langtoft, 6½ miles N. of Driffield, lies in a hollow just on the eastern edge of the range of chalk hills called the Yorkshire Wolds. Part of Langtoft is built on the steep slope of the wold which rises sharply at the back of the village; a lower ridge shelters it in front from the east.* The coast is about 8 to 10 miles due east. The population numbers about 600, engaged almost entirely in agriculture. In the centre of the village is a large pond, into which most of "the nastiness" of the village finds its way (including the discharges from a slaughter-house). This pond has been for a long time a source of nuisance to the village, the houses being built round and close to it. Smells are complained of in summer, and windows have to be kept shut on that account. The pond, which sadly needs cleaning out, is used by the farmers for watering stock. Recently a portion of the drainage has been cut off from entering the pond by the construction of a drain (of glazed and socketed pipes) which discharges, however, into the overflow of the pond, and the sewage, running in an open "grip," reaches another pond lower down and is there "lost." The water-supply of the village is from a well in the place said to be 150 feet deep; the top of the

* Passing recently through Langtoft I was struck with the remarkably confined situation of the village; it is in a narrow hollow of the chalk wolds, shut in by steep hill-slopes on all sides, as the valley which forms the outlet is narrow and winding. The air of the hollow felt perfectly stagnant; and was redolent throughout the village of bad odours from manure in farmyards and other sources.—H. F. P.

well is covered, but several slop-water and farmyard drains run near it. The steining is open, and surface-water was seen running freely into the well between the stone joints. The well is supplied with two buckets on an endless chain.

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The excrement disposal is by privies in the yards behind the houses. Some had pails or other removable receptacles, but those I saw were all in a horribly filthy state, the excrement overflowing the receptacles. I noticed that open and unenclosed ash-pits were used by the children as privies. Some privies had dilapidated and broken-down doors, which could afford no screen to the occupants.

Influenza.—Early in December some children attending the school were taken ill with what is now recognised to have been Influenza. By the middle of the month the disease was epidemic. On December 19th the attendance at school had fallen to 73, the daily average for the year being 111.7. On December 17th, the master entered in his log book, referring to the preceding week (beginning December 10th): "There is a great deal of coughing among the children, and the attendance is rapidly decreasing." The schoolmaster himself had Influenza on December 7th. Early in January a child died (a delicate child, 18 months old, a twin, who had had measles in the autumn but had never been well since); an inquest was held, as no medical man had attended it. Influenza was given as the cause of death. All ages and classes suffered. For some weeks after Influenza had appeared at Langtoft, no cases were known to exist in the adjacent villages. Dr. Sutcliffe, of Kilham (3 miles off), who practises in the district, says there were no cases at Kilham till well on in December, nor in any other of the villages in which he practised. Dr. S. says he himself contracted the disease while attending the Langtoft cases about the 17th of December. He saw three cases of Influenza with a rash, chiefly on posterior parts of limbs, petechial in character, and epistaxis occurred in several cases.

The origin of this outbreak is very obscure. Locally it was attributed to fogs which had prevailed in November. Since my visit to Langtoft, when I had traced cases back to Martinmas week, I have, from two correspondents, received different versions of its introduction into Langtoft. (1.) A young man from Langtoft went to a wedding at a village (Fordon) halfway between Langtoft and Filey. He returned next day, and, according to the clergyman of the parish, the man developed Influenza on November 9th. On writing to a correspondent in the implicated village, I found that it is denied that any Influenza existed there at that time or since. So far as can be learnt the cases which appeared in Langtoft at the end of November were all in young men. The first scholar attacked was from a farmhouse a half-mile out of the village, where one of these young farm servants had been ill about Martinmas Day (November 23rd).

(2.) The other version of the story is read in two ways. (a.) A married man went over to a village (Muston) 2 miles from Filey on November 13th to attend a funeral. He returned home next day. One of his relations who came from Filey, and who met him at the funeral, began with Influenza two days later. On the one hand it is asserted that this man brought back from the funeral to Langtoft Influenza, which afterwards hung about the village, spreading only irregularly till December, when it became epidemic. On the other hand (b.) it is asserted that this man took Influenza with him to the funeral from Langtoft and gave it to his Filey relations. The vicar of Langtoft, who has made himself acquainted with the circumstances of the case, exonerates, so far as his knowledge goes, this man from having had Influenza at all, notwithstanding his Filey relatives' accusations. The

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balance of evidence, such as it is, favours the opinion that the young man who was taken ill two days after his visit to the marriage at Fordon on November 7th brought the disease to Langtoft.

This young man's father and mother say he was very ill, and from what they have since heard of the symptoms of Influenza, they are sure he had it then. This young man lived at a small farmhouse a mile out of the village, and this may account for the delay which took place in the spread of the illness. People do not visit much in winter in the Wolds, but at Martinmas every servant leaves the farm, and they visit friends and neighbours and make excursions to towns and round the countryside in search of amusements.

If we are to accept this theory as to the importation of the disease into Langtoft, we are still in the dark as to how or from whom the young man caught his illness when attending the marriage. There seem to have been cases of Influenza about Filey in November, and how they arose is equally obscure. Probably the poison taken at the marriage was part and parcel of the same poison which a week later we hear of at Filey. It may have existed at Filey earlier. The Medical Officer of Health at Filey, Dr. Orr, says he is satisfied the disease was imported into Filey through the persons attending the funeral at Muston where the Langtoft man (Coates) attended, and whose relation was the first case in Filey so far as the Medical Officer of Health can learn.

There was no information obtainable at Langtoft regarding "influenza" among horses. It was denied by those from whom I sought information that any illness had been prevalent before the epidemic among horses or stock of any kind.

Since my visit to Langtoft I have heard that cases of Influenza had been observed at Patrington in the East Riding. Perhaps inquiries made there might give some light regarding the cases in Filey and Langtoft.

The information obtainable at Langtoft is much less in quantity and less reliable in quality than that obtained at E. Keal, Lincolnshire (due, in the latter case, in a great measure to the assistance I had from Dr. Francis J. Walker, the Medical Officer of Health).

Dr. Wood, Medical Officer of Health for the Driffield R.S.D., said there had been no Influenza epidemic in Driffield. Dr. Brand of that town corroborated this statement; nor had they heard of its prevalence in any other adjoining districts.

Dr. Wood visited Langtoft on January 7th to make some inquiries regarding the reported epidemic. He visited several cottages where cases were still occurring. Two days later he says he felt headache and orbital pain, with a general aching of his limbs, with great prostration. He felt somewhat ill for four days, one of which he passed in bed. He has no wife or family. His two servants were observed to have almost similar symptoms later on, but for these he could fix no date. He admits that in Driffield there has been an undue prevalence of bronchial and catarrhal affections, he believes not of a specific kind.

The statement last made to me by the Filey Medical Officer of Health is that Influenza appeared just about the middle of November, among women and children, and afterwards among the fishermen. At first he did not believe that the cases were those of "Russian" Influenza, but on looking back he now believes that the cases were specific, and not ordinary feverish colds. The first cases among fishermen attacked were in December, probably the first week. There are 30 smacks there carrying each six men, who go out to the Dogger Bank. Most of the fishermen are in a club of which Dr. Orr is the medical adviser, but he keeps no

record of their illness, or dates of attendance. The boats are away for more than a week at a time, depending on the weather. I saw three fishermen who were convalescent, their cases were unmistakable. Two of them belonged to one boat. They were all very prostrate, and complained of pain over the spleen. The cabins in which all these men sleep when at sea, are very small, close, and ill-ventilated. I interrogated the men on the question of having contact with foreign fishermen, but they all denied this. One, the master of a smack, said the foreign boats were often within a few yards of them, but unless either crew had run short of water they did not board the other's boat. With regard to this master's own attack, he said they started for the fishing ground, but 12 hours after leaving port one of the hands became so ill that he decided to steer back to Filey. He himself was taken ill the same day as they landed. He now thinks he got his illness from the man who was taken ill first. Another fisherman told me he got his attack on shore, his wife was ill of it. This evidence seemed adverse to the suggestion that Influenza may have been brought to Filey (and thence to Langtoft) by fishermen who had contracted it from foreign fishermen.

Filey, Muston, Fordon, and Langtoft are all more or less near the east coast, Langtoft, of course, being furthest inland (from 8 to 10 miles), but built against the wold. Any wind-borne contagion blown across the north of Europe to this country could strike these places. But we have no evidence that the wind carried contagion, nor can we explain why certain localities swept by the same wind escaped the disease for weeks after it was established elsewhere. It is possible the sanitary surroundings of Langtoft rendered it a more favourable soil for an imported contagion to breed upon. The pond in the centre of the village and its pollution might help the evolution of a poison, which was abortive in other and more cleanly places. It is stated that Langtoft suffers from every epidemic of infectious disease that visits the Driffield district.

GENERAL ILLUSTRATIONS of the IMPORTATION of CONTAGION.

(1.) The following are examples met with in the inquiry pointing to the probable importation of the disease from London, in December, to the provinces.

Importation of
contagion.

(For the following instance I am indebted to Dr. L. Cane, of Peterborough.) The village of Paston lies about 3 miles north of Peterborough. Up to Christmas no cases of Influenza had been heard of in the village, nor were there any cases of catarrhal illness of any kind in the village so far as Dr. Cane and the vicar of the parish knew. On December 23rd, a little girl, daughter of the vicar, travelled from Wandsworth Road to Paston, viâ King's Cross. On the 21st of December she had been at a children's party, and had been romping and occasionally kissing a small boy who was said to have had Influenza (but the weak point here is, the date of the boy's attack is not known). On December 26th the girl was seized with Influenza. On January 1st four other children also developed the disease (they had not been outside the house since their sister began on the 26th). On January 5th, two daily visitors to the house, and who had been observed to kiss the sick children frequently, developed the illness. On January 7th the vicar himself began. On January 11th the husband of one of the visitors was attacked, and after this the disease became epidemic.

Dr. Cane says there is little communication between Paston and Peterborough. It is possible, looking at the interval which elapsed

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between the party (on the 21st) and the girl's attack (on the 26th), that she may have taken the disease while travelling from Wandsworth to King's Cross, or from there to Paston. Cases are related where infection has been taken in this way. Here is one told me by Dr. Paley, Medical Officer of Health for Peterborough Urban and Rural Districts. A young gentleman living in the country some miles from Peterborough went to London one day in December to transact business. He returned the same night. He travelled in a first-class compartment with one other passenger, both windows were closed, as the elderly gentleman explained, because he was "recovering from Influenza." Two days later the young gentleman developed all the typical symptoms of epidemic Influenza, and within a few days his brother and sister, who resided with him, were also seized in the same way. There had been no cases before this in that locality. Dr. Walker, of Peterborough, says most of his first cases were commercial travellers who travelled daily by rail. Some were taken ill when away, but returned to their homes to lie up. These men would act as diffusers of the disease to those who travelled with them in the compartment. Dr. Walker's cases began in the third week of December, and extended well into January.

In some rural districts in Northamptonshire the disease is said to have developed after the return of those who went to London to the Smithfield Stock Show in December.

A country practitioner told me he went up for three days' holiday to London on December 18th (to 21st). On December 19th he went to Barnum's Show, to which he travelled by Underground Railway. In the same compartment with him for some of the distance was a man who seemed very ill, with a hard dry cough and evident prostration. The practitioner thought no more of this circumstance at the time. He returned to his home on the 21st. He felt ill on December 22nd, but managed to drag himself about till the evening of the 24th, when he felt extremely unwell. During the night he was unfortunately sent for to attend a confinement 4 miles off. With a great effort he managed to get there and was able to return soon. He took at once to his bed and sent for a medical brother, who found him with a temperature of 104°. He remained in bed till the morning of the 28th when he got up and drove to see his confinement case, who resided at an isolated farmhouse away from other houses. He remained some time in the bedroom with the lady (who was going on well) and her husband, both of whom began with Influenza on December 31st. On January 3rd the only other member of the family, a boy aged 2, began. The doctor remembers too on his way home on December 28th calling to vaccinate a child, whose mother began to be ill on January 1st, but I understand that the vaccination did well and the baby did not take Influenza. The mother had several relapses.

A family came from London to a country village on the day before Christmas to stay with friends. The same evening the mother of the family from London developed Influenza, and it spread through the family to the neighbours till it was epidemic in the village.

At some country houses, where visitors from London and elsewhere were entertained during Christmas week, shortly after the house party was complete, the Influenza began, the general belief being that some convalescent from London was the source of the mischief. Several instances were given where visitors to London had returned to their country homes ill with Influenza.

At Market Deeping the disease was first observed about the middle of December. Mr. Benson gives me the following history of its supposed introduction. The clerk at the Market Deeping post office (a young man about 21) paid a visit to London on December 11th. He spent most of the day at the General Post Office, and was shown over the various departments in the building. He returned to Market Deeping the same night. A few days later he seemed ill, and developed a loud hard cough, which was worst at night. On December 16th one of the daughters of the postmistress (a widow) took ill with the usual symptoms of Influenza, but accompanied by bilious vomiting. This girl assisted her mother in the shop and was therefore in daily contact with the young man. The disease went through the whole family (10 cases), except the grandmother, aged 78. The clerk had unfortunately left Market Deeping at the date of my visit, so that I had no opportunity of questioning him. Previous to this Mr. Benson says there had been no such case; the first case (the girl's) in the family at the post office was so acute that it was at first diagnosed to be typhoid. In Market Deeping I saw a gas stoker from Greenwich (one who had gone to take the place of the strikers); he began with Influenza at Greenwich on December 29th. He travelled back to Market Deeping by rail (still ill) on January 4th. He probably helped to spread the disease by infecting the third class compartment in which he travelled. His wife took ill after his return.

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HORSE-INFLUENZA.

I visited the Veterinary College, Camden Town, and saw Professors Brown, Axe, and McQueen from whom I received a large amount of information. I also saw Mr. J. G. Gresswell, M.R.C.V.S., at Louth and from him obtained some interesting facts.

Horse-influenza :

At Camden Town the authorities did not consider horse-influenza the same as the disease in man. I saw several convalescents in the stables, but the epidemic was over. Horse-influenza began to show epidemic proportions in London in October and lasted till the end of December. No attendants on the animals were known to suffer from any symptoms resembling those of the horses. There are several varieties of disease known as "influenza" among horses, but the present epidemic has been different from others which preceded it in the following particulars:—

views of
professors at
Veterinary
College :

1. Its suddenness of onset.
2. Its short duration of symptoms.
3. Its absence of complications.
4. Extreme prostration.

The incubation period is said to be from two to eight days. The illness seldom lasts more than a week unless the animal has been worked or exposed. The acute symptoms themselves are only present usually three or four days, but the prostration is extreme and may persist some time afterwards. The disease begins with shivering, in some with griping. The invasion is sudden. The highest temperature reached is usually at beginning of illness. In severe cases the temperature reaches 107° (normal temperature of horse being 100·6°). The average highest range is 105°. In three or four days the temperature has sunk to normal. Professor McQueen has supplied me with the

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temperatures of a case treated in the hospital in November, but the case lasted longer than many of the others had done.

—		—		Day of Disease.
Nov. 5	-	— 105·8	-	1?
„ 6	-	— 103·8	-	2
„ 7	-	— 103·8	-	3
„ 8	-	— 104·	-	4
„ 9	-	— 102·	-	5
„ 10	-	— 103·	-	6
„ 11	-	— 102·	-	7
„ 12	-	— 101·	-	8

The disease is regarded as highly infectious and “goes through” large stables when once it has got a foothold. The temperature some times (as in man) falls to subnormal on the first few days of convalescence. No observations had been made to determine whether or no the spleen was enlarged. Injection of conjunctivæ in horse-influenza was of no more frequent occurrence than in the human variety, that is to say it was not usually met with in ordinary cases.

The following is an extract from a paper by Mr. Dollar, M.R.C.V.S., on “influenza in the horse” in the “Veterinary Record” of Jan. 4, 1890.

of Mr. Dollar.

“The symptoms presented by well-marked cases were as follows* :—

“The eyes were closed and discharging a thin acrid secretion, the head pendent and pushed into a corner, the coat staring, one or more legs filled, and the patient frequently raised the affected leg or legs as though in pain. Food was refused, though water was well taken. On examining the affected limb it was found swollen and tender, and the horse walked stiff, or more frequently lame, on it. The tissues involved were the fibrous and fibro-serous structures in the neighbourhood of the extensor tendons, and where the swelling extended higher up the leg to the hock or knee the subcutaneous tissue over the course of the lymphatics. These parts were found hot, swollen, and tender to the touch, but the swelling (especially in the lower part of the leg) seemed more elastic than that of lymphangitis, did not pit on pressure, and was chiefly confined to the posterior aspect of the limb. Not unfrequently one leg alone was affected. Proceeding to a closer examination: the pulse rate was accelerated, the average of the first readings of 20 cases being 57·9 beats per minute, and the extremes 40 and 76 respectively.

* The description of horse-influenza given by Mr. Dollar is not altogether like that given me by the Professors at the Veterinary College, nor by Mr. J. B. Greswell, Louth. These gentlemen spoke of the absence of catarrhal symptoms, and did not speak of swollen legs in ordinary cases.

[The disease described by Mr. Dollar would seem to have been the erysipelatus form of Prof. Bollinger. See p. 105.—H. F. P.]

The pulse was soft and of small volume, and in severe cases almost imperceptible. This was especially notable where the horse had been worked when the subject of high temperature. In more advanced cases there was intermittency.

"The conjunctival mucous membrane was thickened and infiltrated with a serous exudation, which gave it a semi-translucent, gelatinous appearance, while in colour it was a dull brick-red tinged with yellow. There was a local tenderness as well as photophobia, and in some cases the cornea was milky from infiltration with leucocytes. Occasionally flakes of lymph were mixed with the lachrymal secretion. The schneiderian membrane, in the high temperature stage, was rather dry and tinged with yellow; in the latter stages a little watery discharge moistened it, but this was never abundant. The buccal membrane was yellowish and the tongue furred. The temperature ranged from $101\frac{3}{5}$ to $104\frac{3}{5}$ F., the average of the first readings of 20 cases being $104\cdot03$ F. In the early stages auscultation revealed roughened breathing, and the dry sounds of pneumonia, but these were, in two or three days, replaced by mucous *râles*, or altogether lost.

"From an experience of about 60 cases during the last few months I should place the incubation stage at from two to four days. Experiments to determine this point ended negatively, and of six healthy horses placed beside sick ones none became seriously affected. In cases their temperature rose after the second or third day by $1\cdot0$ to $1\cdot5$ F., but the characteristic lesions were absent, and the temperature soon after declined, no inconvenience being shown in the interval. This was, I think, because all the susceptible subjects had become affected before the experiments was made and those remaining (from which the six referred to were selected) were capable of withstanding the disease."

Appended to this paper were a series of temperatures.

Below I have made a comparison in parallel columns of the chief characters of the disease as observed in man and in the horse:—

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Comparison of
human and
equine
"influenza."

Epidemic Influenza in Man observed in recent Epidemic.	Epidemic "Influenza" in Horses as observed in the cases treated at Veterinary College and in Lincolnshire.
1. Short incubation, stated to be from 2 to 4 days.	1. Short incubation 2 to 4 days, "at most it is well under a week."—Professor McQueen.
2. Sudden invasion, men taken ill while at work, or walking on the street.	2. Sudden invasion, animals often taken ill while at work.
3. Short duration of acute period—in mild cases 1 to 4 days only. In severer cases or in complicated ones a week or more.	3. Short duration of acute period—1 to 4 days. Sometimes a week or more in severe or complicated cases.
4. Absence of marked catarrhal complications in the majority of the cases.	4. Absence of marked catarrhal complications in majority of cases.
5. Leading features of illness are shivering, headache, orbital pain, backache, aching of limbs, congestion of fauces, hard dry cough, fever, prostration, subsequent anæmia or debility. Seldom fatal result, and only due to exposure or working while ill, or where patient is the subject of serious chronic ailment or old age.	5. Leading features of illness are, shivering, pains in limbs, cough hard and dry, fever, prostration, and subsequent anæmia or debility. Seldom fatal unless worked while ill, or exposed during illness or too soon after illness.
6. The disease is infectious.	6. The disease is infectious.

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Supposed
communication
from horse to
man and vice
versâ.

Mr. J. B. Gresswell, of Louth, had had a very large experience of horse-influenza. Since the spring of 1883 it has persisted in Lincolnshire. He has known of its special prevalence in Grimsby and district. In August 1889 Mr. Gresswell's four horses contracted the disease he says from some infected horses in a stable, the ventilators of which opened into his yard. Shortly after his own horses were taken ill he himself was taken suddenly ill. His temperature was found to be 102. He felt quite "done up." After a few days his acute symptoms subsided, and he resumed his work, but had a relapse. This was followed for some months by great nervous depression, palpitation, and shortness of breath. His assistant, shortly after Mr. Gresswell's illness, was also attacked. He (Mr. Farr) describes his symptoms as at first consisting of headache, fever, great prostration, and a sensation of having been beaten all over. This attack came on quite suddenly, and he remembers great aching in his limbs. He had several relapses and suffered afterwards from shortness of breath and great palpitation. He did not finally get rid of his symptoms till he had a complete change of air and rest from work. More recently Mr. Gresswell's two pupils suffered from Influenza, but as the disease was now becoming rife in Louth (beginning of November) there is no evidence to point to their contracting it from animals; but Mr. G. and his assistant are confident that their ailment was taken from the horses, many animals besides Mr. G.'s own having suffered at the time; both the assistant and the principal were daily in contact with many infected animals. They were also greatly overworked. Mr. Gresswell says he remembers three other instances where persons engaged in waiting on infected horses developed the disease. One case was that of a stable where four horses were taken ill on December 1st; shortly afterwards (the dates are not given) the man who chiefly waited on the animals became ill, and after him his wife and child. But as human Influenza was epidemic in Louth in December, this case is open to objection. Mr. Gresswell said he remembered two other instances.

At Thirsk Dr. R. Hartley informed me that both he and his groom had Influenza (contracted from his patients) in December. Within a fortnight his best horse was unable to work and was pronounced to have "influenza," while his other two horses were amiss and had bad coughs. Dr. Hartley is of opinion that the horses contracted their illness from the groom. He did not know of horse-influenza existing in the locality at the time.

At Barton-on-Humber, East Keal, and at Caistor, where Influenza began to show itself in November, horse-influenza had been very prevalent during the autumn months.

On the Continent during the present epidemic in some cities horses have been reported to have been more than usually attacked. In some continental towns the trams ceased running for a time owing to the illness among the horses. London suffered severely from horse-influenza in October, November, and December, in the latter month one firm of carriers lost 30 horses (probably through working them when ill).

It has been noted in former outbursts of human Influenza described by older writers that horses suffered from a similar disease at the same time as man.

In the present epidemic in this country the horse-influenza preceded the human disease. Whether a common poison affected first the horse and then man—or whether man's poison was first elaborated in the horse before it acquired sufficient potency to reach man—there is not as yet evidence to decide. Though the features of the disease in the horse

and in man show a resemblance it is possible that they are distinct diseases.

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Miscellaneous Notes on Influenza in Horses, Dogs, and Cats.

The following is an example of coincident Influenza prevailing among human beings and the lower animals; it occurred at a village in the Caistor Rural Sanitary District, Lincolnshire.

Horse "influenza" was imported into the village during the summer of 1889. It did not spread then, but later on, in November, cases occurred among the horses working on the farms. At one farm many horses were suffering from weakness in November, and could not do their day's work. It was said they had had mild attacks of Influenza. I have obtained information from three of the principal farmers of this village regarding the prevalence of "influenza" among cats and dogs.

"Influenza"
in cats and dogs.

(1.) At the first farm, a valuable pet pug bitch was taken ill on December 2nd. Its symptoms were prostration, fever ending in diarrhœa; it took no food for three days, and then quickly recovered. Its playfellow, and also a pet of the house, was a kitten. This animal was taken ill just before the pug (about December 1st). It had similar symptoms to the pug, but had running from the eyes and nose; it recovered after a few days illness. At the same time the groom's cat which lived in the stable was taken ill much in the same way, but recovered. Owing to the swarms of rats which have lately multiplied so greatly in the locality, the farmer kept five cats in the yard. These did not enter the house, but would of course be in communication with the house cats. Three of the yard cats died after a short illness just before December 3rd, and the two others just after this date. The farmer's groom asserts that he can recollect the names of persons who among them in the village lost 22 cats about the end of November and the early part of December. He further states that in his opinion there were others of which he had not heard. At a farm one mile from this village three cats died in December after a short illness, and at another farmhouse two miles off two more died in a similar way about the same time. All these people deny that poison could not have killed the cats, since the farmers had forbidden the destruction of rats by poison, fearing that poisoned food might be devoured by their dogs, poultry, or other animals. Some also feared their children might touch the poison. In addition to the cats that died it is said that both in this village and those adjoining many other cats were ill but recovered.

(2.) In the second farmhouse, a pony had a cold, with severe cough and inability to work late on in November. During the last week in November the farmer's two children, two servants, and a cat were all taken ill with Influenza. About the 1st of December the groom's cat was also taken ill, it recovered, but the first cat died. Ten days later another cat, which was brought from a distance to fill the place of the deceased cat, was taken ill and died on the fourth day of its illness. Its symptoms were running from the eyes and nose, diarrhœa on the second day, fever and weakness. Latterly it could not walk. A bullfinch kept in a cage in the room where the two sick children were being nursed was taken ill about the same time as the children (but this date of the bird's illness cannot be definitely fixed); it died. Three weeks later a canary was purchased and placed in the same cage in the same room. "Within a fortnight" it died, with the same symptoms as the bullfinch. Its body was forwarded for a post-mortem examination to

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the editor of the "Fancier's Gazette," and the reply sent back was that death was caused by "Congestion of the lungs." A week after the canary's death another bullfinch was bought and put in the same cage. It died in less than a week, precisely as the other two birds had done.

At the beginning of December, a terrier dog who came into the house every day and played with the children was taken ill, sick, feverish, hot nose, very weak and listless. It recovered after a few days illness. This terrier was also accustomed to visit with his master almost daily the house just mentioned, when the pug-bitch was ill. At this date, the beginning of December, Influenza was quite general among the people of the village.

(3.) At the third farmer's house, some of the horses had "influenza" in November. A young, unbroken colt, running in a field, died suddenly when the others were ill, but in its case no one had noticed any indications of "influenza" before its death. Early in December a large retriever dog which ran about the yard and stables was noticed to be ill; it had a hard, dry cough, "like that of an old man," its nose and eyes ran, it was feverish and looked very ill, it could hardly walk; its illness lasted only a week.

The labourers and farming servants who took Influenza in this village, state that they are quite confident they got their illness from the horses who were ill.

In explanation of the marvellous mortality among the cats, it is suggested that the cats which died in greatest numbers were the yard cats who found their own living, and were exposed to the cold and wet of the winter nights. In the early part of December there was both fro and snow, and the exposure of these animals while ill to the inclement weather, may have determined the fatal result. Cats kept warm indoors (like those who were pets) did not die, though they had the illness like the rest, with apparently as great severity.

(4.) The M.O.H. for Barton-on-Humber, Mr. Harling Sissons, was informed by Mr. Waddingham, of Ferriby, that on Mr. Popple's farm at Castlethorpe, "during the summer," eight horses had Influenza, and that the men riding on them became ill also.

(5.) The hounds belonging to Lord Yarborough's hunt (North Lincoln shire, in the vicinity of Caistor), are said to have suffered from Influenza.

Mr. Sissons, M.O.H., Barton on-Humber, states the following facts: "In December 1889, the old hounds at Brocklesby broke down with "distemper." Convalescence was protracted through great debility, "and large doses of quinine seemed to be the only treatment of service. Directly after the hounds were recovering, five men connected "with the kennels broke down with Influenza, four being confined to "bed. It is a most unusual thing for hounds three years old to have "distemper."

XI.—LOCAL REPORTS.

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ЧАП. XI.

Some of the more important reports received from medical officers of health as to the behaviour of the Influenza epidemic in particular localities are here given *in extenso*.

REPORT ON THE EPIDEMIC OF INFLUENZA IN THE NEW WINDSOR URBAN SANITARY DISTRICT; by E. CASEY, M.D., Medical Officer of Health.

The epidemic of Influenza has been exceedingly prevalent in Windsor. The first well-marked case that I have heard of was observed on the 23rd of December. This was immediately followed by two or three other cases, but the disease did not spread widely till towards the end of the first week, the 4th or 5th of January, after which it speedily became rampant.

Influenza at
Windsor; by
Dr. Casey.

I have obtained no evidence of its mode of introduction into the town.

The epidemic has now (February 6th) greatly abated, but not yet entirely disappeared. I should estimate, if a somewhat rough guess be permissible, the proportion of the population who have suffered as being not less than one-third, and possibly exceeding one-half. Both sexes and all ages (with perhaps the exception of young infants) were attacked indiscriminately.

The following figures illustrate imperfectly the proportion of men who were invalided by Influenza during the month of January :—

Class of Men.				Number.	Had Influenza.	Per-centage.
Railway men.	Porters and clerks	-	-	52	19	36·5
	Drivers and stokers	-	-	24	2	8·3
	Total	-	-	76	21	27·6
Post Office staff	-	-	-	52	16	30·8
Policemen	-	-	-	19	6	31·5
Medical men	-	-	-	11	10	91·0
Soldiers, Cavalry	-	-	-	450 (about)	62*	13·8
„ Infantry	-	-	-	697	69*	9·9
Women and children in barracks	-	-	-	129	34	26·5

*These figures do not nearly represent the number sick. The surgeon of the Life Guards informs me that probably 75 per cent. of his men were attacked.

Horses were not attacked nor as far as I know were other lower animals.

Weather during the epidemic month was very mild in temperature, with frequent, but only slightly excessive, rain, and boisterous winds.

No other disease was prevalent. There were a few cases of measles. Bronchitis and pneumonia were of much less than average frequency.

The mortality up to the present time has been remarkably low, not much more than 1 per 1,000 of those attacked; the total death-rate from all diseases during January being as nearly as can be calculated at present 19 per 1,000 per annum. Up to February 6th, five deaths had been registered as due to Influenza, deaths from pulmonary diseases being much below average.

The following case shows the period of incubation to be from three to five or six days, according as the earliest symptom, or the fully-developed constitutional attack, is reckoned.

C. is vicar of a sequestered parish which was free from Influenza until about a fortnight after his own sickness.

January 1st,—A friend dined with him; this gentleman had sickened on the previous day with what proved to be a sharp attack of Influenza (which he appears to have contracted three, four, or five days previously).

January 4th, C. suffered from throat cough.
 „ 5th, same, in evening feeling tired.
 „ 6th, felt generally “bad.”
 „ 7th, pains in head and eyes, chilliness, &c.

Concerning the question of infectiousness I have no doubt at all.

(1.) The natural history of the disease resembles that of other infectious (zymotic) diseases. Certainly it most of all resembles a common “feverish cold,” but that disease also I am fully convinced is infectious and zymotic.

(2.) When one member of a household was attacked, the rest nearly always subsequently suffered.

(3.) Medical men were affected early, and in proportion beyond the average.

(4.) Railway drivers escaped with comparative immunity, as compared with porters.

(5.) The case of C. related above, and the history of the incidence of the disease on men and women in Victoria Barracks related below, are evidence on this head.

For the following facts respecting the outbreak of Influenza at Victoria barracks I am indebted to Surgeon-Major Clarke, M.D., Coldstream Guards:—

“January 2nd, 3rd, and 4th.—Two or three cases observed.
 „ 7th and 8th—.37 cases (men) admitted to hospital.
 „ 9th–20th.—20 cases (men).
 „ 21st and later.—Only 3 cases (men).

“No women or children until January 13th, after which up to January 20 31 cases, and later 3 cases more.

“It is obvious that the men who fell ill on January 7th and 8th took the infection from some source to which the women and children were not exposed. If they were infected in some common room, by one or more of the two or three men previously attacked (who no doubt caught it in the town), the power of contagion must be of considerable intensity.

"It is remarkable that the outbreak in cases of men and women respectively was mainly comprised within seven or eight days."

The symptoms of the disease very closely agreed with those described in the accounts of former epidemics from 1510 downwards, but differed from them in being on the whole much milder. In particular the disease showed but little tendency to involve the lungs or bronchi, a circumstance which may be due to the prevalence of mild weather. Neither was there observed the tendency to epistaxis and hæmorrhages sometimes spoken of.

It has appeared to me that the primary nidus of the disease is situated in the posterior part of the nares and pharynx, while the main stress of the general illness falls upon the cerebro-spinal nervous system. Perhaps the ocular conjunctiva has been occasionally the starting point. As *local* symptoms I should class the

1. Slight sorethroat.
2. Coryza and catarrh.
3. Harassing cough.
4. Perversion of taste and smell, with foul tongue and complete anorexia.

As *general* symptoms—

1. Slight shivering.
2. Transient pyrexia (temp. 102–103° F.).
3. Headache; neuralgic pains in any or all the spinal (especially sacral) and cerebral nerves; also delirium or confusion of mind with dejection and prostration of energy. In one case squint was an early symptom.

Gastric symptoms also were not infrequent; convalescence was generally rapid and complete.

Addendum.

The following figures give an idea of the incidence of the disease on children.

Windsor National Schools.
(Not including infant school.)

—	Number on Books.	Average Attendance.	Average absent.
January 1890 - -	527	367	160
January 1889 - -	520	424	96
Excess of average absent January 1890 -			64

This excess may be wholly attributed to Influenza as no other disease was prevalent. And inasmuch as probably an attack of Influenza would not invalid a child for more than a week or fortnight the total number of children attacked must have been about 170, or 40 per cent. of normal average attendance.

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REPORT BY DR. THOMPSON, MEDICAL OFFICER OF HEALTH TO THE
WEST HERTS COMBINED DISTRICTS.

Table showing the dates of first recorded cases and of commencement of extensive prevalence of Influenza in the Middlesex and Hertfordshire combined Sanitary Districts.

District.	Date of first recorded case.	Date of extensive prevalence.
1. East Barnet Valley Urban - - - -	Jan. 3rd	Jan. 10th
2. Barnet Urban - - - -	About Dec. 24th	Early in Jan.
3. Barnet Rural - - - -	Jan. 4th	Jan. 10th
4. Hendon Rural { Stanmore - - - -	Dec. 18th	Jan. 1st
{ Edgware - - - -	Jan. 1st	Jan. 9th
5. Harrow Urban - - - -	Dec. 23rd	Jan. 4th
6. Watford Rural (Bushey) - - - -	Dec. 18th	Jan. 14th
7. Hemel Hempsted Rural - - - -	Jan. 1st	Jan. 7th
8. Berkhamstead Rural - - - -	Jan. 2nd	Jan. 10th
9. Tring Urban - - - -	Dec. 22nd	Jan. 7th-10th
10. St. Albans Rural - - - -	Jan. 4th	Jan. 15th
11. Welwyn Rural - - - -	Dec. 18th	Jan. 15th

Remarks.—The above dates are those supplied me by the medical practitioners in the different districts. They must, of course, be regarded as only approximately correct, especially those in the first column, inasmuch as that, as a rule so far, only one practitioner in each district has replied to my questions, others may have had earlier cases. The dates of “extensive prevalence” are doubtless more reliable, but some allowance must be made for varying opinions as to what constitutes “extensive prevalence,” particularly when an attempt is made to fix an exact date to it. Due allowance being made for this source of error, it would appear that the disease must have become epidemic in all these districts almost simultaneously. Distance from London seems to have had but little influence upon it, for although Harrow and Stanmore—and perhaps Barnet Urban, but there is no specific date given—which are among the nearest to the Metropolis, are given as the earliest, yet Hemel Hempsted, Berkhamstead, and Tring, the most distant places, may be bracketed with East Barnet and Edgware as coming next, and but a few days later. It will be observed that in two instances (*viz.*, Watford Rural and Welwyn) the interval between the first recorded case and the general prevalence of the disease was unusually long as compared with the experiences of other places. This is a point of some interest, as in each of these instances the first case is said to have been clearly imported, one from France and the other from

London, and although in one of these instances (the Watford case) the disease attacked another person in the same house, no other cases in the neighbourhoods in question were met with by the medical men who recorded these, for some little time (12 days in the Welwyn case and more than three weeks in the Watford one)—in fact, until the disease, having apparently been in some way re-introduced, occurred in an epidemic* form. Could it be conclusively shown that the disease did not exist elsewhere in the neighbourhood of the Watford case during this three weeks interval, the direct infectiousness of the disease from person to person would seem to be established, as it would be difficult to account for the second case in this house on any other hypothesis.

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Answer to Question 4.—As regards the mode of origin and method of spread of the disease the general evidence received is very conflicting, as also are the opinions expressed by different medical men. For instance, Dr. Perigal, of New Barnet, writes, "I have not been able to satisfy myself that it is contagious, *i.e.*, communicable; in two out of about 50 cases it *may* have been; several husbands having it *severely* were nursed by their wives, who did *not* contract it." Dr. Blake, of Harpenden, says that out of 35 cases "in three only have there been more than one in a house." On the other hand, Dr. Thyne, of Barnet, reports that "but few escape when once it has entered a house; one finds as many as eight or more individuals in a household all suffering at the same time." Dr. Steele, of Hemel Hempstead, says "it is decidedly infectious. With greater or less severity, it affects everyone in an invaded household." Dr. Gowan, of Stanmore is strongly of opinion that it is "highly infectious and contagious, and that it is introduced by individuals, articles of commerce, letters, and papers." He has kindly contributed some suggestive cases bearing upon these points—the Watford case above referred to being one of them. They will be found under answer to Question 6. Looking at the matter broadly, the epidemic appears to me to have occurred too simultaneously throughout my districts to be accounted for by the theory of infection by human agency alone; and persons in isolated houses seem to have suffered more freely than would have been anticipated on that supposition. The hypothesis which appears best to fit the facts before me is that the cause of the disease—probably a micro-organism—while being perhaps mainly disseminated by the atmosphere, is also capable of being conveyed by persons and possibly even by various articles of personal use.

Answer to Question 5.—Disease of an unusual description (a species of "influenza," I believe) has been reported to me as being prevalent among horses in my districts,† by two veterinary surgeons, both of whom regard it as being related to the epidemic under consideration. At present I have received no detailed information as to its nature, but I hope to do so shortly. Dr. Pope, of Tring, writes: "Early last October my cats, of which I have several, were troubled by a severe nasal catarrh, with much discharge and sneezing, loss of appetite, and wasting to such an extent that one kitten died, having previously lost its eyesight by conjunctivitis; the mother became so weak and helpless that I had her drowned; a pug dog did not suffer."

* The term epidemic is used in the general sense as meaning prevalent.

† Barnet and Hendon Rural. Information has been received from Veterinary Surgeons at St. Albans and Birkhampstead to the effect that they have met with no unusual disease among animals.

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Dr. Steele reports that the cats at Hemel Hempstead have suffered from a similar complaint.

Answer to Question 6.—Cases reported to me by medical practitioners as illustrating the probable spread of the disease by personal agency; the period of incubation, &c. :—

Dr. Gowan's cases (Stanmore).

Case No. 1.—The patient, who is a corn-chandler by trade, was suddenly attacked on December 18th. This was the first case seen by Dr. Gowan. The "only discoverable cause of infection was the Russian "oats he had been mixing." In the course of a few days the disease spread to every member of his household (6).

Case No. 2.—The same day (December 18th) Dr. Gowan was called to the Watford district to see a young lady with Influenza. She had just returned from the Mediterranean, and "on returning through France "travelled with a lady seriously ill with Influenza. Two days later she "fell ill herself." Her sister apparently took it from her, but I gather that Dr. Gowan did not see any other cases in that neighbourhood for more than three weeks, when the disease became epidemic there.

Case No. 3.—On December 27th Dr. Gowan saw a young stock-broker who had just returned from the East *viâ* Brindisi. He was suffering from well-marked Influenza. Within a week his mother and brother had it.

Dr. Batterbury's cases (Berkhampstead).

The first case of all that Dr. Batterbury met with "was the wife of a gardener sending vegetables constantly to London and receiving "empties back. The next cases were persons who went to London "daily." The following are two examples :—

First Household.	Date of First Symptoms.	Second Household.	Date of First Symptoms.
(1.) Clerk at Euston -	January 3rd.	(1.) Clerk in London	January 6th.
(2.) Father - -	" 7th.	(2.) Brother - -	" 8th.
(3.) Brother - -	" 9th.	(3.) Sister - -	" 12th.
(4.) Workman -	" 10th.	(4.) Sister - -	" 15th.
		(5.) Servant - -	" 20th.

In two other districts (Hemel Hempstead and Welwyn) the disease is reported as having been introduced from a large establishment in Westbourne Grove—in one instance by one of the assistants, who came down to stay there, but in what manner in the other is not stated. Men have been attacked in larger numbers than women and children, though Dr. Thyne, of Barnet, states that "in the early weeks but few "children were attacked. Within the last fortnight children have "suffered equally with adults."

As regards unusual disease occurring concurrently among animals, in answer to my inquiries, I have received nine letters from different veterinary surgeons in Middlesex and Hertfordshire. From these it is interesting to observe that unusual disease among horses is described

as having been met with at Barnet, Stanmore, and Harrow, that is in the three of my districts which are nearest the Metropolis (each about 12 miles distant from it), but, with one exception, this disease does not appear to have been recognised in those neighbourhoods which are further from London, viz., Watford (18 miles), St. Albans (20 miles), Hemel Hempstead (25 miles), Berkhamstead (28 miles), Tring (32 miles). The one exception is Tring, which is curiously the furthest point from London, but there the disease is reported as having occurred mainly among the horses working on the canal between London and the North. If these observations are correct, and I should fancy they must be broadly so, they would seem to imply that the disease does not spread as rapidly among horses as among human beings, and I take it they would point to infection from case to case as the mode of spread among the former. Some allowance must doubtless be made for the mental attitude of the different observers, and it should also be mentioned that the canal, on which the disease is said to have been met with at Tring, also passes through Berkhamstead, Hemel Hempstead, and Watford, though we have no record of the disease at these three places.

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The following NOTES are furnished by Mr. GEORGE TURNER, Medical Officer of Health for East Herts Combined District.

The following information is supplied by Eustace A. Brickwell, M.R.C.S., &c., practising in Sawbridgeworth and neighbourhood, and holding an appointment as medical officer under the Bishop Stortford Guardians.

Notes by Mr.
G. Turner.

“Allens Green.”

“Two children attending the school at Allens Green, a small village to the west of Sawbridgeworth, were attacked with headache, shivering, and vomiting on December 31st, 1889, one returned to school January 3rd, but on the 5th had a sorethroat, pains in the limbs, shivering, and had to go to bed.

“On January 6th, 15 children were absent from the same cause (most suffered from sickness and pains in the limbs).

“On January 8th, 18 more were absent.

“On January 14th, there were still 21 away from school, and the building was then closed.

“The mistress says that fully half the cases were jaundiced, but neither Mr. Brickwell nor his assistant have seen anything of this kind. (NOTE by G. T.—I hope in the accounts received from Hertford to put before you evidence that jaundice had frequently been remarked during the early part of the epidemic in that place.)

“In only two of the cases was sneezing an early or prominent symptom, and only four obtained medical assistance.

“Sawbridgeworth.”

“In Sawbridgeworth the first case occurred on the 7th January, when an assistant in a grocer’s shop was ill. On the 9th, in the same house, three servants, a little girl, and an errand boy were attacked.

“The errand boy lived in a village $1\frac{1}{2}$ miles away, and on January 11th four of his brothers and sisters were ill; on 13th a woman living next door, who nursed them, was attacked.

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"The dates upon which patients applied to Mr. Brickwell were:—

January 7th, one.	January 15th, six; three and two in one house.
„ 8th, one.	„ 16th, three.
„ 9th, four in one house.	„ 18th, three.
„ 11th, five; four in one house.	„ 19th, one.
„ 13th, five; three in one house.	„ 20th, one.
„ 14th, two.	„ 21st, two.

"There were in addition 24 club patients, but no note was made of the dates in these cases. The club patients, however, were attacked at about the same time as the others. At first the cases were slight, they complained principally of pain in the back and limbs and general depression.

"In Mr. Brickwell's house the first case occurred on January 6th, with a short relapse on the 15th, after a railway journey on the preceding day.

"The second case occurred on the 9th.

"The third „ „ 13th, with relapse on the 19th.

"The fourth „ „ 18th."

Mr. Brickwell and his assistant say: "We have not been able to trace any clear case of transference from one person to another, or to form an opinion as to the method of origin of the disease in the place.

"Cases have occurred in nearly every part of the district.

"We have considered cases to be Influenza which have a definite onset of fever, feeble pulse, either frequent or infrequent, great weakness, pains in the back and limbs, with either headache, troublesome cough (without expectoration), or sickness and sometimes diarrhœa.

"In most cases the sweating has been a marked symptom, face flushed so that children looked almost as if they were going to have measles, but the colour is more uniform and the conjunctivæ are not congested.

"We have seen no definite rash."

(NOTE by Mr. TURNER.—I cannot understand the statement that there is no evidence of transference of the poison from person to person, in face of the history of the errand boy, his brothers and sisters, and the woman who nursed them.)

Buckland.

Mr. W. gave a dance; one of his children had suffered from Influenza; every child who attended at this meeting took it, the disease subsequently spread to the village, and the schools were closed in consequence.

Buntingford.—Information obtained from various lay sources.

The disease appears to have been brought into West Mill, a small village near Buntingford, on December 24th, by a young gentleman who had suffered from it in London, his father was next attacked, and it then spread in the village.

Miss M. went to stay at this house on January 3rd, and was ill January 5th.

An entertainment was given in this village, it was attended by members of the family first mentioned.

J. S. employed upon a farm went to the entertainment. Next day, he felt unwell and sick, did not take any notice of it, but kept about his

work; he then became much worse, had severe rheumatic pains in all his limbs, and had to be confined to his bed (four days). He was violently sick, and could keep nothing on his stomach for some days. His two daughters were then ill (they had been to the entertainment), and next his wife, the latter very slightly; no clear history as to dates.

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This village is situated upon low ground, and near the river. Fog is often seen here.

For the following facts I am indebted to W. L. Horley, M.R.C.S., practising in Hoddesdon and its neighbourhood, and to his assistant, Dr. Smyth.

A young man "R" a corn merchant attends Mark Lane, and different country markets; was attacked on December 30th, 1889. The first case in Mr. Horley's practice. His head ached, and he had pain at the back of the eyes, shivering, sickness, great pain in the back and limbs.

His father and brothers and sisters, five in number, were attacked in the same way at regular intervals of two days.

Dr. Smyth, who had not recently been to London, attended R., and within 24-36 hours began to shiver, could not keep warm, and had a headache. Next day he went out but rapidly became worse. His symptoms were similar to those of R., and he was so prostrate, that to his surprise when, after remaining in bed three or four days, he tried to stand, he found he could not do so and fell. His temperature rose to 104° F.

Mr. Horley was ill two or three days after his assistant. He was much troubled by sleeplessness in addition to the other symptoms. There may be some doubt in this case, but he believes that on this occasion he was suffering from Influenza.

There are living in the house the doctor's wife and four children who have all escaped, but a servant was attacked on January 18th.

These two medical men inform me that the disease first made its appearance amongst the better class of patients, and subsequently amongst the labourers and paupers. That it is now subsiding amongst the former, and still on the increase amongst the latter.

N.B.—Nearly all the men in easy circumstance go daily to London on business.

On Saturday, January 11th, I was asked to see the servant of a gentleman living in Hoddesdon. The medical man in attendance wanted my opinion of the case which he thought was scarlet fever, and, if I agreed as to the diagnosis, the patient was to be sent to the London Fever Hospital.

(N.B.—There were cases of scarlet fever in the neighbourhood.)

It was already dark when I received the message and I had to use a candle to make my examination.

The girl had been suffering from severe headache and general malaise, no sickness, only a slight sorethroat, her temperature had been 101°, and the medical attendant had noticed a "firm red rash" on the face, neck, and arms. I could see this rash even by candle-light, it was perfectly even, and like the flush caused by putting the hands into or by sponging the face with very hot water. It extended over the face and neck, and surface of hands, and fore-arms, and disappeared upon pressure.

I called the next morning with the medical attendant, the patient was much better, the rash was still to be seen if particular attention were

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paid to it; her tongue was white and slimy, and her throat not much inflamed.

As there were cases of Influenza in the house, I thought the symptoms did not justify us in sending the patient to a fever hospital, but that there was sufficient ground for the greatest precautions short of that measure. It was therefore arranged that her brother, sister, and niece should be removed there for observation.

There is no reason to suppose now that she had the scarlet fever.

Mr. W. Tibbles
on Influenza in
Melton Mow-
bray Rural Dis-
trict.

EXTRACT from REPORT of Mr. W. TIBBLES, Medical Officer of Health to the Melton Mowbray Rural Sanitary Authority, dated 10th May 1890.*

"This epidemic began about December 18th of last year, and by the middle of February the disease had made its appearance in every part of the district, and the cases were very numerous, probably 75 per cent. of the inhabitants falling victims to the disease. The epidemic ran a rapid course, and at the end of the quarter it had nearly died out, either from want of victims or some change in the atmospheric conditions.

"It now becomes us to inquire how far the death-rate of the district has been influenced by the epidemic. The average death-rate of the district for the last nine years is 15·5 per 1,000; and in last year it sank to as low as 12·8 per 1,000.

"During the quarter just ended however the rate of mortality was excessive, namely 21·2 per 1,000; and in the month of February it rose to 27 per 1,000.

"The following are the villages upon which the incidence of the death-rate fell most severely: Eaton, Holwell, Ab Kettleby, Twyford, Frisby, Nether Broughton, Thorpe Satchville.

"Influenza *per se* only caused eight deaths; as is now well known to medical men the disease is a mild one if promptly and properly treated; but it is liable to relapses and dangerous complications. Owing to the peculiarly depressing and debilitating effects of the Influenza, many who recovered from the epidemic disease had their vitality so reduced that they fell a ready prey to other diseases to which they succumbed.

"The most common complications of Influenza were pneumonia and bronchitis, and the death-rate from diseases of the chest is accordingly very high, namely 35 per cent. of the total number of deaths. This is considerably above the average in our district—the average being 16 or 17 per cent.—and to be attributed to the influence of the passing epidemic.

"There was a dearth of cases of the ordinary infectious diseases throughout the quarter, in fact it seems as though many diseases were for the time being submerged in the flood of Influenza. The cases of scarlet fever, measles, diphtheria, &c., have been remarkably few, and no death was reported due to them.

"The infant mortality shared in the general increase of the death-rate, delicate children in particular being the victims; many of their deaths were indirectly due to the epidemic, while convulsions, atrophy, marasmus, diarrhœa, &c. claimed their usual proportion of the younger children."

* For a fuller account of the Influenza epidemic in this district, see the British Medical Journal for April 12, 1890.

REPORT ON THE INFLUENZA EPIDEMIC AT NOTTINGHAM BY PHILIP BOOBYER, M.D., Medical Officer of Health.

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Dr. Boobyer's report on Influenza in Nottingham.

During the progress of the Influenza epidemic of last winter and spring in the borough of Nottingham, I issued circulars of inquiry to the heads of business houses, factories, local depôts, municipal departments and the like, with an aggregate staff of 8,374 persons, asking for a return of (a) the total number of employés in each establishment, (b) the absentees from reputed Influenza and other diseases during successive weeks in the first four months of the current year, fresh cases only being given for each week, (c) the average number of absentees through sickness during corresponding weeks of past non-epidemic years.

Suitable tables were appended to my circular requiring only to be filled up with the necessary figures in each case.

I am pleased to say that I met with so cordial a response to my inquiry that only a very small fraction of the list of establishments previously prepared remained at the end unaccounted for.

The selected establishments were situated in all parts of the town, and their employés may be taken as fairly typical of the great mass of its inhabitants.

The following table gives in as concise a form as possible the most important part of the information I was able to gather, together with other statistics useful for purposes of comparison.

It will be seen that the local epidemic practically commenced about the middle of January, that it reached its maximum of both prevalence and fatality during the week ending February 22nd, and that it rapidly declined after the end of March, although occasional cases continued to be reported for some eight weeks after this.

During the week of greatest prevalence the death-rate of the town (per 1,000 of population per annum) was increased by no less than 8.1 above the average, and the deaths returned as due to bronchitis, pneumonia, pleurisy, and Influenza by exactly 100 per cent. above the average for the corresponding week of the past five years.

I have made no reference in the table to age or sex, for after the first five years of life (up to which point there appears to have been a considerable amount of immunity in both sexes) all seem to have been attacked alike.

I have given a short account of the meteorological conditions existing throughout the epidemic, but, as observed elsewhere, they do not appear to have exerted any influence upon its progress, the regularity of its upward and downward curve being unbroken notwithstanding extreme variations in the weather.

With the exception of scarlet fever, a mild epidemic of which has existed in the borough for some months past, the sickness and mortality from all zymotic disease were much below the average during all the winter and spring.

So far as I was able to gather there was not throughout the epidemic any unusual sickness either in kind or amount among local animals.

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Dr. Boobbyer.

INFLUENZA and other DISEASES in NOTTINGHAM BOROUGH from week ending 18th January to week ending 19th April 1890.

Week ending	Jan. 18.	Jan. 25.	Feb. 1.	Feb. 8.	Feb. 15.	Feb. 22.	March 1.	March 8.	March 15.	March 22.	March 29.	April 5.	April 12.	April 19.
Influenza; fresh cases among 8,374 persons employed in various occupations.	26	64	160	240	308	312	274	210	154	104	78	26	22	
Other diseases do. do. entailing absence from work.	101	130	146	168	152	150	158	156	166	124	106	98	82	85
Average number of absentees at ordinary times from all diseases.	86	—	—	—	—	—	—	—	—	—	—	—	—	—
General death-rate of Nottingham.	15·9	17·9	15·4	20·6	25·6	26·8	22·7	23·4	20·6	20·9	19·1	15·0	19·5	—
Mean rate for corresponding weeks of recent years.	18·7	—	—	—	—	—	—	—	—	—	—	—	—	—
Total deaths from Influenza, Nottingham, 1890.	—	1	—	1	2	6	3	5	3	4	2	1	—	—
Total deaths from bronchitis, pneumonia, pleurisy, 1890.	19	23	15	29	40	36	36	29	24	23	13	11	14	12
Total deaths, average for past five years.	16	18	17	19	21	21	21	22	17	23	19	15	17	20

The temperature from January 5 to the end of the month was remarkably high, having a mean daily reading of no less than 12 degrees above its average. The atmospheric pressure was slightly below the average from the 15th to the 29th, and somewhat unusually variable. The rainfall was slightly above the average, and S.W. wind was prevalent. The temperature in February was below the average almost throughout; atmospheric pressure was above the average throughout the month. The rainfall was small. Cold winds from E. and N.E. The weather of March was very variable, extreme readings of both barometer and thermometer being frequently recorded. S.W. was prevalent and the fall of rain was slightly in excess of the average. The beginning of April was for the most part fine, dry, and cold with a high barometer. The recorded cases of, and deaths from all zymotic diseases, except scarlet fever, were considerably below the average during the whole of the winter.

Establishments from which returns was obtained: — Railway depot, police and prison, gas department, sanitary department, water department, hosiery factories, hosiery warehouses, lace warehouses, lace factories, machine factories, silk mills, shoe manufactories, and printing offices, with some private offices and small business houses.

EXTRACT from REPORT for quarter ending March 1890, by J. SPOTTISWOODE CAMERON, M.D., B.Sc., Medical Officer of Health, Leeds.

On Epidemic Influenza in 1889-90; by Dr. Parsons.

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INFLUENZA AND DISEASES OF AIR PASSAGES.

“While our mortality from the seven zymotic diseases has been below the average mortality of the 28 large towns, our mortality from diseases of the air passages has shown a marked increase on that of the corresponding quarter of 1889. Our deaths from consumption in the first 13 weeks of 1889 were 155, and in the corresponding part of the present year they have been 189, an increase of nearly 22 per cent. From other diseases of the air passages the deaths in the first quarter of 1889 were 432, during the quarter just past, including those from Influenza, they were 800, corresponding to death rates respectively of 4·85 and 8·83 per 1,000 of the estimated population, or an increase at the rate of 82 per cent. on the rate of mortality from this group of diseases.

Dr. J. S. Cameron's report on Influenza in Leeds.

The prevalence of Influenza in the borough during the quarter accounts largely for the excessive mortality from this group. Commencing with a few sporadic cases in the last week of December, the disease did not attain any great hold upon the town till the close of January. Statistics furnished me by 38 medical gentlemen of the town show that the disease became increasingly frequent up to the end of February, from which time it began gradually to decline.

I place in the form of a table the total numbers attended by those gentlemen during the seven weeks ended respectively on February 1st, 8th, 15th, 22nd, March 1st, 8th, and 15th.

NUMBER of NEW CASES of INFLUENZA which have come under MEDICAL TREATMENT during the seven weeks ended March 15th, as returned by 38 MEDICAL GENTLEMEN out of 144 in practice in the Borough of Leeds.

Week ended Feb. 1st.	Week ended Feb. 8th.	Week ended Feb. 15th.	Week ended Feb. 22nd.	Week ended Mar. 1st.	Week ended Mar. 8th.	Week ended Mar. 15th.	TOTAL.
221	309	337	342	255	175	134	1,773

As only about a fourth of the practitioners in Leeds are included in the above list, we may take for granted that, as something like 1,773 new cases were visited by them during those seven weeks, it would be a tolerably safe estimate to conclude that somewhere about 7,000 cases of Influenza came under medical treatment between the 26th January and the 15th March; and as these were by no means the dates of either the commencement or the conclusion of the epidemic, and as the cases treated by medical men would form but a small part of the whole of the cases, I do not think it would be an over estimate to suppose that some 50,000 cases of Influenza occurred in Leeds. The deaths from Influenza were most numerous in the middle of February.

The diseases of the respiratory system, exclusive of Influenza and phthisis, were most fatal towards the end of February. In the week ended March 1st there were 85 deaths the number of deaths having

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jumped up from 53 in the week ended February 8th, to 72 in the week ended February 15th. There were 67 deaths in the week ended February 22nd, and 85, as we have seen, in that ended on the 1st March. The deaths from this group in the three following weeks were 56, 60, and 54.

The deaths attributed to Influenza occurred in the following weeks:—

Week ending -	Jan. 4.	11.	18.	25.	Feb. 1.	8.	15.	22.	Mar. 1.	8.	15.	22.	29.	Total.
Deaths -	—	—	—	1	—	1	4	2	3	2	1	3	2	19

INFLUENZA in the READING URBAN and WOKINGHAM URBAN AND RURAL DISTRICTS, by ALFRED ASHBY, M.D., Medical Officer of Health.

Dr. Ashby;
report on In-
fluenza in Read-
ing and Woking-
ham districts.

1. Commencement of epidemic:—

A. In Reading, December 1889.

B. In Wokingham, December 1889.

C. In Wokingham R.S.D., December 1889.

2. Date of commencement of increase of mortality:—

A. *Reading*.—Influenza began to be extensively prevalent about January 6th, 1890. The general mortality rose in the week ended January 11th, 1890, and continued higher than usual until the end of March. The deaths actually certified as due to Influenza were eight in number; of these five happened in February, two in March, and one on May 17th.

B. *Wokingham*.—The above remarks apply. Two deaths in February were certified as due to Influenza.

C. *Wokingham R.S.D.*—The same remarks apply. Two deaths in February and one in March were certified as due to Influenza.

3. Week in which the mortality has been greatest:—

A. In Reading, eight deaths were certified as being due to Influenza; one on February 2nd, 7th, and 8th respectively; two on February 9th; and one on March 18th, 24th, and May 17th respectively.

The general mortality was high during all the weeks of the 1st quarter of the year, but was highest in the weeks ended February 1st, February 15th, and March 18th.

B. In Wokingham two deaths were certified as due to Influenza, and they both happened on February 13th. The general mortality during the quarter was not increased.

C. In the Wokingham R.S.D., the three deaths from Influenza took place on February 9th and 16th and March 2nd.

The mortality from other diseases was higher than usual, and was highest during the week ended March 15th.

4. Date at which the epidemic may be considered as ended:—

A. In Reading the epidemic had practically ceased at the end of the first quarter of the year.

B. In Wokingham it had ceased at the same time.

C. In the Wokingham R.S.D. it terminated at the same time.

Influenza was introduced into a parish in Berkshire as follows:—

Mrs. G., who had been spending Christmas week in London, returned by rail on Friday, 27th December 1889. She felt ill in the train with shivering, &c., but that night dined out at a friend's house. The gentleman who took her in to dinner, and the gentleman who sat on her other side at dinner, each of them developed Influenza on the following Thursday, 2nd January 1890. A medical man saw Mrs. G. on the morning after the dinner party, and found her with well marked Influenza.

The gate porter at a college (Wellington College) in the same parish had initial symptoms of Influenza on Monday, December 30th. On the succeeding Sunday and Monday, January 5th and 6th, his wife and all four of his children developed the disease. There were many cases amongst the boys in the college.

In another college (Bradfield) nine boys had Influenza; the first case was imported from another place, and the others were caused by it.

In one instance a visitor from Kew, from a house with Influenza in it, developed characteristic symptoms three days after arrival. Three days afterwards another member of the household took it. The disease then went through the whole household in the course of a week.

In another house a gentleman who had come from London on December 21st, fell ill on the 24th, another person in the same house fell ill on the 23rd, another on the 26th, another on the 29th, and altogether 12 out of 14 living in the house were attacked.

In the practice of several other medical men some of their earlier cases came from London or other infected places where Influenza was prevalent at an earlier date than in their neighbourhood.

The first case of one practitioner was contracted at Redhill, where Influenza was widely prevalent. The patient spent Christmas there, returned home on December 30th, and fell ill on January 2nd.

Influenza is infectious from one person to another, but not to so great an extent as such diseases as measles, small-pox, &c. Some practitioners found that often there were only single cases in houses, and often only two, while several others found it nearly always spread in a house when once introduced into it, and one could not recollect any house in which it had not spread after a first attack.

The disease appears to be capable of wide aerial dissemination. At first chiefly adults suffered, and apparently males more than females, later in the epidemic children also suffered (but not so severely), and I heard of none under two years of age being attacked.

Post office employés, the police, the employés of a biscuit factory, and of drapers and other business establishments suffered severely, as did also paupers, the working classes generally, and the better classes without distinction.

There was no special incidence of the disease in any particular locality in the town or country districts.

There was always a sudden onset of the disease with rigors and much nervous depression. Other symptoms were somewhat various and included. Severe frontal (sometimes general) headache, various extreme muscular (often lumbar) pains, and high fever $38\cdot4$ to $40\cdot6^{\circ}$ C. for 24 hours, often catarrh from 48 hours to five or seven days after commencement, and pneumonia or bronchitis not uncommon; often gastric disturbance, some cases having begun with severe diarrhœa, or vomiting and diarrhœa; a few were associated with jaundice, articular rheumatism or epistaxis, one with herpes, one with erythema nodosum, and several with urticaria or severe facial neuralgia; sore throat in a few cases, no albuminuria.

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One practitioner found relapses very common, another observed that they were moderately frequent and often entailed prolonged after effects. The epidemic has appeared to exercise a decidedly bad influence upon many other diseased conditions. One practitioner observed two cases of quiescent phthisis started into activity afresh by attacks of Influenza.

MEMORANDUM ON INFLUENZA PREVALENCE IN MANCHESTER; by
Dr. TATHAM, Medical Officer of Health, August 8th, 1890.

Dr. Tatham's
report on In-
fluenza in Man-
chester.

In April last, with a view of obtaining trustworthy statistics concerning the recent prevalence in Manchester of the disease known as "Influenza" or "Epidemic Catarrh," I addressed circulars to those of my medical brethren practising in the city whose addresses were known to me, asking to be favoured with a statement (on a form enclosed) of the weekly number of new cases of Influenza coming under their care during the previous six months.

In reply to my circular, I received information of the occurrence of 4,945 attacks within the 25 weeks ending with the month of April last.

The returns received up to the present date have been tabulated and thrown into the form presented in the accompanying table (see pp. 281-2), in which the number of attacks and of deaths from Influenza are given for each consecutive week of the before-mentioned period, together with meteorological particulars as promised to be interesting in relation to such these events.

In the course of October last a few cases of Influenza are stated to have been observed in the city, but the returns do not indicate any serious prevalence of the disease until towards the end of 1889. According to the table, it was during the first quarter of the current year that the largest number of cases were observed, 85 per cent. of the total recorded attacks having occurred within that period.

With the object of arriving at a rough estimate of the extent to which the population of Manchester was suffering from Influenza at the time when the epidemic appeared to be at its height—namely, towards the end of February last—I addressed communications to the proprietors of most of the large business establishments in the City, asking for information as to the number of persons then in their employ who were incapacitated by the prevailing disorder. The replies courteously furnished to me by the proprietors of 146 of these establishments, in which nearly twenty-three thousand persons in the aggregate were employed, conveyed the assurance that less than two per cent. of this large population were actually suffering from Influenza at the period referred to.

The Manchester Workhouse Infirmary at Crumpsall was the first public institution invaded. The epidemic began there in the first week of December and terminated with the closing week of March. Amongst an average aggregate population of about 1,200 officers and paupers, 192 cases in all were observed.

The Hulme Cavalry Barracks experienced a sharp visitation of Influenza at the beginning of the year—18 cases in all occurred, amongst a staff of 392 officers and men. All the attacks took place between the 9th and the 21st of January, no further development of the disease having been noted since the latter date.

Her Majesty's Prison in Strangeways suffered somewhat severely from this disease during the month of February, a few subsequent cases occurring about the middle of March. From the 1st to the 15th of February Influenza threatened to become very troublesome, for the Prison contained at that time an average population of 1,000, and of

INFLUENZA IN MANCHESTER.—1889-1890.

STATEMENT OF NOTIFIED ATTACKS and of DEATHS from INFLUENZA in the CITY of MANCHESTER, together with certain Meteorological data for each of the 25 weeks from October 26th 1889, to April 19th 1890.

—	1889. Weeks ending										1890. Weeks ending																			
	November.					December.					January.					February.					March.					April.				
	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19					
Number of Influenza attacks	-	-	19	31	39	43	49	94	117	81	94	177	203	233	242	316	398	487	600	539	409	290	192	107	65	69	51			
Percentage of total attacks	-	-	0.4	0.6	0.8	0.9	1.0	1.9	2.4	1.6	1.9	3.6	4.1	4.7	4.9	6.4	8.0	9.9	12.0	10.9	8.3	5.9	3.9	2.2	1.3	1.4	1.0			
Deaths from Influenza	-	-	0	0	0	0	0	0	0	0	0	0	0	1	0	3	4	7	3	5	5	6	4	2	2	2	1			
Temperature in shade	Maximum	-	55.2°	55.8°	56.3°	55.8°	50.6°	43.9°	52.8°	53.9°	52.7°	50.4°	56.2°	54.3°	55.0°	51.7°	46.8°	46.2°	47.7°	50.2°	51.7°	58.3°	58.8°	60.3°	60.7°	58.0°	54.8°			
	Minimum	-	42.6°	37.7°	36.8°	39.9°	29.0°	31.6°	29.8°	33.0°	33.5°	24.0°	38.7°	37.0°	32.9°	32.0°	31.8°	32.9°	35.1°	29.0°	26.0°	32.0°	37.0°	37.9°	32.0°	33.0°	37.0°			
Mean temperature	1889-1890	-	47.6°	48.4°	48.8°	46.3°	38.0°	37.1°	39.6°	44.5°	43.4°	34.7°	47.5°	46.3°	41.6°	42.3°	39.8°	37.2°	40.3°	38.1°	38.6°	46.8°	44.2°	48.2°	43.7°	43.0°	44.2°			
	Dec. Average	-	46.3°	45.6°	41.7°	43.4°	43.3°	40.7°	39.2°	39.5°	39.4°	40.6°	38.6°	37.4°	40.1°	40.3°	41.3°	39.4°	41.9°	38.9°	41.2°	40.5°	42.4°	42.5°	43.7°	46.1°	47.0°			
Mean dry bulb temperature (1889-1890)	-	-	47.2°	48.6°	48.7°	45.9°	37.6°	36.8°	39.6°	45.0°	43.5°	34.8°	48.0°	46.4°	41.9°	42.5°	39.5°	36.5°	40.0°	38.0°	38.7°	46.5°	43.5°	48.8°	42.6°	43.2°	44.8°			
Mean wet bulb temperature (1889-1890)	-	-	45.5°	46.9°	47.5°	44.4°	36.4°	34.9°	38.3°	43.5°	41.7°	34.4°	45.8°	45.0°	39.7°	41.2°	37.8°	35.1°	38.7°	36.3°	37.2°	44.4°	41.8°	46.8°	39.5°	39.4°	41.8°			
Mean humidity per cent.	1889-1890	-	89	88	92	91	89	84	90	87	86	95	85	90	84	93	86	88	92	86	87	85	87	86	77	72	77			
	Dec. average	-	85	84	84	85	84	82	85	85	87	87	85	86	84	87	86	86	82	83	84	83	79	78	75	78	75			
Rainfall (inches)	1889-1890	-	.810	.043	.460	.200	.460	.385	.788	.894	.190	.140	.490	.167	1.455	.760	.020	.060560	.932	.430	.740	.020	.375	.047			
	Dec. average	-	.771	.551	.408	.706	.644	.654	.910	.607	.768	.804	.297	.246	.598	.768	.604	.549	.366	.516	.611	.236	.516	.315	.363	.409	.305			
Wind 1889-1890	General direction	-	SW	WNW	SW	S	NNW	ESE	S	S	S	S	SSE	WSW	SW	WNW	NE	ESE	E	NE	NNW	SSW	WNW	W	SSE	N	E			
	Horizontal Movement	-	3.2	1.0	0.6	1.3	1.7	1.2	1.9	2.0	1.2	1.7	4.1	4.1	3.8	1.6	0.4	1.3	1.4	1.5	3.3	3.4	2.0	1.8	0.2	1.6	2.4			

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these not less than 57 persons were attacked during that fortnight alone. The total number of persons affected at the Prison during the epidemic was 77.

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At the Royal Infirmary no cases were reported during 1889, but from the beginning of January last down to the 12th April, 53 cases were observed, either amongst the residents or amongst the out-patients.

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Dr. Tatham.

At the Ancoats Hospital, the first case was reported on the 18th January, and the last on the 4th March, 78 cases in all being observed by the officers of that institution during the above-mentioned interval.

I desire here to record my appreciation of the generosity and public spirit shown by the governing body of the Ardwick and Ancoats Hospital in offering to place 40 of their beds at the disposal of the Corporation for the isolation of cases of Influenza, at a time when there was every prospect that hospital accommodation would be urgently needed.

St. Joseph's Industrial School remained free from Influenza until the end of the third week in February; but during the fourth week an outburst of the disease occurred, 75 persons being laid up in the course of that week, and 19 more during the next. After this period no further cases occurred.

At the General Post Office the disease was at one time stated to be very prevalent; but at the date of my inquiry only 23 persons out of a staff of 1,600 were suffering from that complaint.

The mortality directly attributable to Influenza during the recent epidemic has been slight, only 45 deaths in all having been registered as due exclusively to that disease. On reference, however, to the weekly bills of mortality during the period of greatest Influenza prevalence, it will be seen that not only have diseases of the respiratory organs been exceptionally fatal, but that the general death-rate at one time exceeded the normal by not less than 66 per cent.

Of the 45 registered deaths at all ages from Influenza, only two occurred amongst persons under 25 years of age; whereas 31 deaths were those of persons aged from 25 years to 60, and 12 of persons over 60 years of age.

In most of the fatal cases the deaths were medically certified to have been due to Influenza, complicated with either lung, brain, or kidney disease. Very few of the deaths were attributed to Influenza alone in the medical certificates of the cause of death.

EXTRACT from the "HEALTH BULLETIN" of MR. C. E. PAGET, Medical Officer of Health of the Borough of Salford, for the quarter ended March 29th, 1890.

The first quarter of the year 1890 was notable on account of the prevalence of epidemic Influenza within the borough. Its first appearance was in Broughton, about the middle of December 1889; but the epidemic did not seriously invade the poorer districts of the borough until the month of February. The period of epidemic intensity began about the first week of February, and reached its maximum about the third week of February. From this latter time the disease steadily, though not rapidly, declined, and had practically died out by the end of March. The disease indirectly occasioned 19 deaths, as, in the fatal cases, pneumonia usually supervened very quickly.

Mr. Paget's
report on
Influenza in
Salford.

On Epidemic
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Dr. Paget.

The question as to whether the spread of this disease was chiefly due to direct personal infection, or to causes in great measure external to the body, is still *sub judice*; but I think that the evidence we now possess tends to the conclusion that, in the first instance, personal infection was the direct cause of the appearance of the disease in particular localities, whether from person to person directly, or by the carriage of infection through the medium of some article recently possessed by a sick patient. This does not necessarily imply that infection introduced into a particular house would spread throughout the household any more than in the case of other infectious diseases, whatever the risk of spread may be. But it does seem reasonable to suppose that the infection having been introduced into a household some of the inmates might suffer from contagion, being more susceptible than others, whether they were temporarily or habitually weak or infirm, or in apparently good health.

The Salford experience would seem to support the theory of infection in a further consideration, namely, that though the disease made no fresh strides in that portion of the borough where it first appeared, and which is a residential district, and not overcrowded, for quite six weeks, and, therefore, did not spread till the end of that time to the more crowded parts of the borough. When it did appear in localities of greatest population-density, the disease spread with the greatest rapidity.

The onset of the disease was generally marked by very great suddenness, and it was usually impossible for an individual, who had been attacked, to fix with any precision the occasion when he was exposed to known infection, and not unfrequently he could not name any such occasion. These experiences not unnaturally give rise to a prevalent belief that the infection of the disease was principally air-borne, and it is not improbable that it was so within certain limits of area. The extent to which infection could spread by air-carriage from one person to others would appear, however, from the Salford experience, to depend largely upon the conditions as to population-density of the area within the limits of which it might be supposed that the infection could thrive, and the slow rate of progress in one locality as against a rapid rate in another may well be due to difference in respect of overcrowding of persons, and not due to marked differences in the method of spread of the disease.

The power of personal infection was most noticeable during the height of the epidemic, which obviously means when the disease had invaded the most crowded parts of the borough, and consequently the greatest daily amount of sickness occurred, and was not apparent, or only feebly so, when the disease was spreading slowly through an uncrowded area, and the attacks of susceptible persons on entering an area with an atmosphere overcharged with infection do not in themselves form an argument against the original spread of the disease from person to person.

The following are brief extracts from some of the replies sent in by medical officers of health, illustrating the mode of introduction or commencement of Influenza in a locality, its incidence on different classes of persons, and the communicability of the disease from animals to men or vice versâ.

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"In a family residing in an isolated country house, the father of the family returned from London with the disease on February 21st; on February 23rd one child was attacked, on the 25th a second, another inmate on the 27th, and on the same day three male servants residing on the premises, but having no communication with those previously attacked."—F. W. KIRKHAM, M.O.H., Downham R.S.D.

"Appeared first sporadically, chiefly attacking heads of families, but not spreading to other members."—F. LONG, M.O.H., Welis-next-the-Sea.

"When a member of a household is taken ill other cases occur in from 24-30 hours, and the last cases are the most severe."—J. S. FENTON, M.D., M.O.H., Brackley.

"Visitor from London visits friends in the country, is ill, but does not seek advice. Two people in the house sicken with Influenza on the 3rd day.

"A nurse goes to London for her holiday, sickens with Influenza, returns to her situation a week or more after the attack, and resumes her duties with the children. One child has a sharp attack, the rest escape.

"A family leave for London on January 6th quite well, return home on the 9th ill with symptoms of Influenza. C. B., staying as a visitor in the house, sickens on January 15th."—L. B. CALCOTT, M.O.H., Oundle.

"The first cases in this neighbourhood undoubtedly arose by direct contact; now I am unable to say so in all cases as it has become so general. Prevalent mostly among better class people; in the majority of gentlemen's houses in this district it has gone through every indoor member, including servants. Second case within 48 or 60 hours from first."—D. JACKSON, M.D., M.O.H., Hexham.

"Cases in the general hospital and in the isolation hospitals do not appear to have communicated the disease to others. February 8th, 1890.

"During this week three scarlet fever convalescents in the isolation hospital on an open hillside two miles distant from the borough were attacked with intervals of 36 hours and 48 hours respectively between 1st and 2nd and 2nd and 3rd. These cases were at this time and have been for some three weeks isolated by themselves in a small ward."—February 15th, 1890. P. BOOBYER, M.O.H., Nottingham.

"In some instances whole households are simultaneously attacked; in others one member only."—F. JOY, M.O.H., Thetford.

"First occurrence of Influenza, Monday, 6th January, 8 cases. Commencement of general prevalence, Monday, 13th January, 22 cases. The outbreak on the 6th extended over different parishes, as also that of the 13th. I had no isolated cases under observation before the 6th.*

* On January 28th he says: "With the exception of a few cases the first onset was on January 6th."

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Isolated cases have come under observation between the 6th and the 13th and up till now (January 21st). In three families cases have followed one another. Where a case in a family could be isolated no fresh case has yet arisen. The cases that first came under my observation were all in the better classes; now I hear of it among the poor.”—THOS. CLARK, M.O.H., Western Division, Williton R.S.D.

“At first the epidemic affected almost entirely those who had business in London and the workmen at the Small Arms Factory, Enfield, many of whom live in this district. Lately it has attacked many who live in lonely parts of the country, 3 or 4 miles away.”—WALTER F. CLARK, M.O.H., Cheshunt.

“First case January 25th, 1890. Prevalence January 27th. Attacks several members of the same household almost simultaneously. St. Helens free.”—ALFD. WOODWARD, M.O.H., Ryde.

“In most cases I have noticed the head of the family going to town on business seemed to first contract the disease and then it spread by infection to the others after a lapse of 10 to 12 days. Males were attacked in greater proportion. Females had it severely, and children. About 109 men connected with large railway works in this district were affected with Influenza, out of a total of 300 men employed. They were tunnelling, and liable to catch cold quickly: they seemed more liable to contract Influenza than men working elsewhere.”—REG. A. STOTT, M.O.H., Friern Barnet.

“Up to January 7th I could not say that any extraordinary symptoms had been noticed in the very prevalent colds. A.B. went on January 7th to Salisbury, where Influenza had been very prevalent for some time before it appeared here. On the same evening he observed the characteristic pains about him; next day he had to stay in bed and part of January 9th. That day his wife developed it in a very severe form. Both were convalescent on January 12th. On January 14th an aunt visiting at the house developed it in a very severe form, and on January 17th her sister also.”—HERBERT V. RAKE, M.O.H., Fordingbridge.

“A German lady, who constantly received letters and parcels from Berlin, appears to have had well-marked Influenza so far back as October last, but I cannot trace any other cases in the same household until just recently (February 12th, 1890), when the servants developed the disease.”—C. J. DENNY, M.O.H., Blackwater R.S.D.

“The first case was an articled clerk who was only 16 hours in Leeds when he began with catarrh. Next day he returned to his home into a family of eight adults. His sister was the only person attacked, and that was four days after his return. (No further spread seems to have followed).”—JAMES SEDGWICK, M.D., M.O.H., Northern Division, Great Ouseburn R.S.D.

“The first cases seen were clearly imported from London. A mother and three children went to Barnum’s show on a Monday quite well. On the Thursday following all were taken ill with the prevailing epidemic.”—C. S. TICEHURST, M.O.H., Petersfield R.S.D.

“A nurse at the fever hospital had three days’ leave of absence. At Devizes this nurse was in the company of a patient with Influenza. Two days afterwards she was taken ill with Influenza, and again, two days after that, two other nurses were taken ill with the same disease.

Since then two other nurses were taken ill with Influenza four and six days respectively after the first nurse. These are all the cases which have occurred at the hospital, and it is worthy of note that they were all scarlet-fever nurses."—B. H. MUMBY, M.O.H., Portsmouth.

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"In one family of seven children and the father and mother, the two elder daughters went to London on the 7th January to attend a ball at a friend's house on the evening of January 8th. They danced with some gentlemen who said that they were not very well or had just recovered from Influenza. They returned home next day. On the 14th the father was taken ill and had to go to bed. That night the two daughters were down with it, and two days afterwards the other five children were seized."—JAS. CLAPPERTON, M.D., M.O.H., Stockbridge R.

"It appears to have been wholly introduced by persons conveying it from previously infected districts, particularly from London. Railway officials at different stations suffered early, so that railways seem to have been one chief channel, at any rate, for the conveyance of the disease. The disease seems to have spread from person to person directly, through infected persons coming into proximity or contact with others in a position to take the disease. In many families only one person suffered; in another class two, three, or four persons all suffered together; in a few instances the whole household suffered. These mostly fell ill about the same time."—F. COOMBER, M.O.H., Walsingham R.S.D.

"Mrs. S. visited her brother in an adjoining parish who was ill with Influenza on	Feb. 12, 1890	} 3 days
and was attacked herself	Feb. 15, "	
Maid-servant attacked	Feb. 18, "	3 days
Mr. S. attacked	Feb. 19, "	4 days
Mrs. H. came to nurse Mrs. S.	Feb. 18, "	} 3 days
and was attacked	Feb. 21, "	
Miss S. came to nurse Mrs. H.	Feb. 22, "	} 2 days
and was attacked	Feb. 24, "	

Mrs. H. had not been previously exposed to Influenza infection, but Miss S. had".—EDGAR G. BARNES, M.D., M.O.H., Eye.

"Certainly and largely introduced by letters from infected districts and houses. The first case here occurred after the receipt of letters from Vienna by a person who had not herself left Shanklin for three months."—G. H. R. DOBBS, M.D., M.O.H., Shanklin.

The following account is given by MR. H. WHITFIELD, editor of the "Western Daily Mercury," through MR. GREENWAY, M.O.H., Plymouth.

Influenza in
office of
"Western Daily
Mercury,"
Plymouth.

"An epidemic catarrh accompanied by violent pains in the head, front and back, has prevailed for four or five weeks in the office of the "Western Daily Mercury," and has in its course probably affected some 60 or 70 per cent. of the employés, including editor, reporters, compositors, and errand boys. I (editor) returned from the Manchester meeting with a violent "influenza" which I contracted in London, and which I felt particularly in Portsmouth, where I stopped *en route* to Plymouth. I am habitually subject to "influenza," but this was accompanied by pains in the back and unusually severe headache. It hung about me for some time. Two or three weeks afterwards I found that our sick list of compositors was gradually mounting

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up. A fortnight ago it was so serious I went to the composing room with a doctor, and he put all who were there on quinine, as they were all more or less complaining. The next day I suffered from bad headache, and contracted a fresh attack. The men invariably complained that when they came out into the morning air they experienced a sickly noisome atmosphere which caused some of them to vomit. There were cases in which men taken on to fill the places of the sick became sick after being in the company of the others, and had to leave off. I am told that our compositors carried the disease home to their families."

"First case January 2nd, 1890. Prevalence began January 10th. The disease was evidently introduced by the patient I saw on the 2nd January. He, a boy aged 14 years, came from Eton the previous day and from a house where several other members of his family had been attacked, having become infected by a brother who brought the complaint from Germany. I have been unable to discover how this case affected the next, which occurred in a cottage a considerable distance away. This district consists of two villages, Lynton and Lynmouth. The former is situated 400 feet above the latter, which is on the sea level. At the present time (January 18th, 1890) there are no cases at Lynmouth, although there is constant communication between the two places."—F. C. BERRY, M.D., M.O.H., Lynton.

"The first case to my knowledge was that of the postmaster; he was attacked on the 18th December 1889, the same day as an unusually heavy mail had been received from Paris. He assisted in sorting these letters and opened and read one himself. The following day (19th) his wife was attacked, and on the 27th one of the clerks. A few days later a second clerk. On the 1st of January two of the postmen were laid up. The disease spread to the postmaster's two brothers and their households who live near and with whom he held frequent intercourse. The disease may be contracted by direct contact with an infected person, or the infection may be conveyed from one person to another by a third person, who is, and may remain unaffected by it."—T. H. TRACEY MUDGE, M.O.H., Paignton.

"The first case seen was that of a lady who met at a ball at Keswick on January 10th a gentleman who had all the symptoms of a severe cold, who had fainted that morning while dressing, and who after the ball took to his bed and was ill with bronchitis. He had come from Torquay and slept the previous night at Preston. Three days after the ball the lady showed symptoms of Influenza. Three days later again her sister who slept in the same room, and subsequently three of the servants in the house, suffered in the same way. The house is an isolated country house, 4 miles from Wigton, and no extension of the epidemic in the neighbourhood could be traced to it."—THEOBALD A. PALM, M.D., M.O.H., Wigton.

"First case January 5th. Was taken ill myself on this date. Two previous days had seen a young surgeon in the rural district, who two days previously had returned on S.S. "Tartar" from the Cape and had a smart attack. From January 5th cases were numerous. I was inclined to attribute my own case to personal contact with the surgeon named above, though other cases as mentioned above occurred almost simultaneously with my own. One case I attended in the rural district singularly enough had come from the Cape in the same ship as the surgeon named above. In some cases it has seemed to me to spread by contact. Children at school have been attacked rapidly though in most cases the recovery was quick. During the past fortnight (March 1)

the adjacent villages have been suffering, and nearly all the elementary schools have been closed in consequence."—MARK JACKSON, M.D., M.O.H., Barnstaple.

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"January 6th, 1890. It was brought into the district by an officer on leave from an infected garrison town. He had it in the ambulant form and had a serious relapse at the 8th day. In all cases the patients had been receiving letters from infected houses."—E. ROUSE, M.O.H., Bideford R.S.D.

"My first case had been ailing indefinitely some two or three weeks before definite symptoms. He had been associated with two young men lately from London who had slight Influenza. The disorder spread in varying degrees through the family, nine members being more or less affected. The above case led to a belief in its infectious character, but I have had many others which bear against this view."—J. MAY, jun., M.O.H., Devonport.

"The first case had an incubation stage of exactly 48 hours (? or less). R. S., a clerk in a large drapery establishment in London, was attacked with Influenza in common with about 40 others. Owing to the serious illness of his mother residing here he travelled to Holsworthy before he was convalescent. He reached Holsworthy at 5 p.m. January 4th. At the same hour on January 6th his brother, J. H. S., was taken ill with a shivering attack, and also another relative residing in the house. Both had severe attacks of Influenza. More children have suffered from the disease than adults. No particular localities have been observed to have been especially attacked."—WALTER G. GRAY, M.O.H., Holsworthy, R.

January 20th, 1891.—Only a few cases of Influenza as yet, and most of these had been in London or had friends down from London at Christmas-time. It first occurred in the last week of 1889. There is no extensive prevalence as yet, except amongst the troops in garrison and on Board H.M.S. "Hercules." So far it appears only where there has been direct communication. Since its appearance here three weeks since it has only spread amongst bodies of men congregated together.

"February 17th.—The first cases among the civil population began in the last week of January, and at the present time are increasing at the rate of 20 or 30 a day. Nearly all the cases are adults, particularly young men from 18 to 25. Few children have it as yet, and those that are ill have it less marked than adults; but there are 350 children absent from the schools out of 900. Many of my cases have apparently taken it from nursing others, or were members of the same family. I have traced several cases as the result of visiting others sick with the disease."—A. McLEAN, M.D., M.O.H., Portland.

"Forty-three cases have occurred among convicts, warders, and their families, the first being on January 29th, 1890. In the case of adults who contract the malady, the symptoms run much higher than in children. Hitherto I have not seen a longer interval than ten days between the attacks of different members of a household. I had one death in the case of a child four years old, who developed marked adynamia on the fifth day with incessant vomiting."—J. B. COOKE, surgeon, H.M.'s Convict Prison, Portland, through DR. McLEAN, M.O.H.

"Up to date (January 20th, 1890) 53 such cases have occurred in the Verne Citadel, Portland. The first case occurred on January 2, and was that of a young soldier who developed it the day after return from furlough in Shoreditch, London. It then seemed to spread chiefly by infection. On January 5, seven men living in the same part of the

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barracks as the first case became infected, and of the subsequent cases over 80 per cent. came from this part of the barracks, viz., the southwest flank. In several of the cases direct infection could not be traced. The prevailing weather was mild, but with sudden variations in temperature and damp fogs of almost daily occurrence."—E. M. WOODS, M.B., Surgeon, Medical Staff, through Dr. McLEAN, M.O.H., Portland.

"On December 29th a few cases of catarrh appeared, and from January 4th to 19th 45 cases of Influenza occurred on board H.M.'s 'Hercules' (among about 300 men), none since January 19th. The disease was brought direct from London and Portsmouth by men returning from leave, and spread by direct infection. It attacks the feeble chiefly. On board here the seasoned men and boys have escaped. Young men who have not been abroad have been mostly attacked. About 7 per cent. sick daily."—ALEXR. R. JOYCE, Staff Surgeon, H.M.'s "Hercules," through Dr. McLEAN, M.O.H., Portland.

"On H.M.S. 'Boscawen' training ship for boys (about 500 boys), between January 19th and February 10th, 15 cases of Influenza occurred, 13 of them boys. There was of course frontal headache in all more or less, but no prolonged nervous symptoms. On January 19th the first case occurred. 1 on January 22nd; 1 on 23rd; 1 on 26th; 8 on 28th; and 3 on 30th. It was probably brought on board by boys returning from London from leave on January 16th."—R. G. BROWN, M.B., Staff Surgeon H.M.S. "Boscawen," through Dr. McLENA, M.O.H., Portland.

"At Portland, 'Top-hill,' Influenza first occurred among the civil population on January 16th, and began to be prevalent about the 3rd or 4th of February. It was apparently directly transmitted from one person to another. The first case was that of a man who followed his occupation 'under the hill,' where Influenza first showed itself. At a lighthouse situated about a mile beyond the most outlying village two boys who came into the village to school were taken ill, both at the same time. All the other members of the family had Influenza one after the other, apparently deriving the infection from the boys. When any member of a household is attacked, some at least of the others have almost invariably suffered subsequently; in many instances the whole household has suffered. The intervals of attack seem to be very variable. As regards locality, the most outlying places certainly seem to have been the last to be attacked."—D. J. LAWSON, M.D., Portland, through Dr. McLEAN, M.O.H.

"For the last fortnight or so (February 22nd), there has been undoubted Influenza; but a milder form has been in existence for some weeks. The first cases were so mild that it was doubtful whether they were true Influenza, and therefore it is difficult to mention a date of commencement. The mild and more severe cases seem to have merged into one another. Taking the early cases to have been the true form, it is probable that it may have been communicated from London, as some of the earliest cases had been visiting in London immediately before the attack. In one family where several of the members suffered, three out of four cats have died from similar symptoms, and the fourth cat was ill, but recovered."—ROBERT H. SAWYER, M.O.H., Shaftesbury.

"I think it due to atmospheric causes; the outbreak is too sudden for infection. Several members of a household are attacked the same day. The epidemic in this district commenced about January 26th at Langton Matravers, and has travelled to Bere Regis from east to west, the wind during the period being E. and N.E."—F. D. LYS, M.O.H., Wareham, R.S.D. (Compare next extract.)

"Influenza first occurred on January 21st, 1890. I found that the first cases could distinctly be traced to people who had been in contact with the disease in London, and from them it spread to other inhabitants of the town and thence to the country."—A. BLAKISTON, M.O.H. Wareham, U.S.D.

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(198 men, 46 women, and 50 children are reported to have been attacked in the population of Wareham (2,112), or 14 per cent.)

"January 19th.—I am strongly of opinion that it is not contagious. I have had about 25 cases in my own practice, and in no instance has a second member of the household been attacked.

"February 7th.—I am still of opinion that the disease is not contagious, although since my last report I have had several cases in the same household. The number of cases has greatly increased during the past week, and the disease shows aggravated symptoms."—J. W. PRIDHAM, M.O.H., Weymouth, R.S.D.

"January 25th.—Two or three cases have occurred where Influenza seems to have been transmitted by letters and parcels. The cases have been widely spread and not confined to any one part of the district.

"In one instance a member of a family went home from school suffering from the disease, which was three days afterwards developed in three other members of her family."—HY. TIZARD, M.D., M.O.H., Weymouth, U.S.D.

"January 18th.—During the past week a few isolated cases have occurred in the town of Wimborne, and an epidemic at Gaunt's Common, especially among children attending Gaunt's School, which has been closed on account of the majority of children being attacked. It appeared to spread by contagion among the school children, and to be communicated by them to their families."—C. H. PARKINSON, M.O.H., Wimborne and Cranbourne, R.S.D.

"A young lady who has been at school in Germany brought it into this district about the end of December 1889. From that time it gradually extended. It is very infectious in some houses, less so in others. Some families have been attacked successively in their entirety. In my own family I have had one solitary case. The number of cases has been enormous."—G. W. DANIELL, M.O.H., Blandford.

"The appearance amongst members of one household in which four servants were attacked, if not simultaneous, presented so little interval as almost to preclude infection, if any period of incubation is necessary."—G. M. EVANS, M.O.H., Bridport.

"It suddenly appears in a village, attacking several members of a family at once, or within 48 hours of one another, the rich as well as the poor; some families escaping although living in adjacent houses to those infected."—WM. RENDALL, M.O.H., Western Division, Dorchester, R.S.D.

"It appears to spread within 48 hours from one member of a family to another. Post office clerks chiefly affected. Have not noticed any difference in particular localities."—E. J. DAY, M.O.H., Dorchester.

"Mr. Breach of Aston, in the Wallingford rural district, states that he traced the introduction of Influenza to the village, to a house where a lady was attacked, who received a letter from her sister at Monte Carlo, where the family of nine persons were down with the complaint in the course of 48 hours. There were more than 100 attacks in Aston, and from Aston the complaint spread to the surrounding villages."—W. T. G. WOODFORDE, M.D., Berks Combined District.

"February 7.—An outbreak of what appears to be epidemic catarrh or Influenza has occurred at the Trimdon and Trimdon Grange Collieries. The first occurrence, so far as known, was about the 23rd of January 1890, and extensive prevalence commenced on January 30th. I have reason to believe that the disease was imported from Hetton-le-Hole, and that it is of an infectious character. That it is not due to meteorological conditions or to seasonal influences is evidenced by the fact that the disease is confined to the two villages, and so far has not spread beyond them; and that it is of an infectious character is shown by the great number of cases (400 or 500) that have occurred, and the number of persons of the same family who have suffered from the disease.

"February 19th.—Since that date of my last report (February 7th) the so-called Influenza has spread generally through the more densely populated parts of this sanitary district, and is now showing itself in the agricultural portions. A few cases have occurred in isolated places, where the sufferers were not conscious of having been in contact with persons suffering from the disease." — GEO. R. SHERATON, M.O.H., Sedgefield R.S.D.

"Introduced chiefly by people who have gone to Carlisle, where the epidemic was very prevalent for some time previously. Once introduced into a family it has rapidly spread to others. It spreads very rapidly when introduced into a school among children. A farmer living away up a valley, miles from other houses, and who had not been from home for months, went to Carlisle on Thursday and stayed till Friday evening. The disease was then very prevalent there. On Saturday night he developed the disease, and his housekeeper on the following Tuesday night. At many of the outlying farms, where the farmer or servants are in the habit of going to Carlisle on the Saturday, they break down about the Monday after."—T. A. WOTHERSPOON, M.O.H., Brampton R.S.D.

"The first established case (on January 3rd) I think must have been caused by infected letters; the patient had a large London correspondence."—C. GORE KING, M.O.H., Keswick.

(The disease did not begin to be extensively prevalent at Keswick till about the middle of February.)

"Introduced from Edinburgh (January 3rd) and affected an entire family except two. The first case seems to have infected a brother three days after. Another sickened two days after him. Then a sister and a servant were affected two days after. On January 10th Influenza was developed in another part of this district. (The patient had been in the house of the affected family.) The wife was affected two days after. On January 14th another case occurred about 300 yards from that last mentioned." (Extensive prevalence began in week ending February 9th.)—W. H. SPURGIN, M.O.H., Maryport.

"Influenza has prevailed in houses close to the workhouse, but at the workhouse itself (population 81), no cases of Influenza have occurred. The master has exercised care in keeping newly admitted paupers by themselves for a few days."—H. H. BACH, M.O.H., Blofield R.S.D.

"It attacks those exposed to chill, and especially those associated together in numbers, such as workmen, factory hands, &c. Farm labourers and those habitually out of doors are not much affected."—T. S. MAGUIRE, M.O.H., Potterspurty R.S.D.

"It is obviously transmitted by individuals coming into affected localities, then going home. It attacks them in two or three days, and afterwards spreads in their families. Then, neighbours calling, spread it around the new focus, as also do schools."—F. BARROW, M.O.H., Rothbury.

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"Men who are employed out of doors have suffered most, but when it is introduced into a house others who rarely go out of doors are troubled with it. Intervals of attack range from 24 hours to six or seven days. Four or five days being commonest interval."—J. T. KNIGHT, M.O.H., Carlton, Nottingham.

"Great variety in the time of its incidence in different localities. Certain people (and I think this runs in families) are very susceptible as compared with others, the relations in a house are often attacked, and the servants and visitors escape. If the system is occupied by another disease, I think that the Influenza often leaps over them. I think those who take quinine as a prophylactic come off lightly. Young children, as a rule, escaped."—GEO. ADAMS, M.O.H., Bedminster, R.

"It appears that the disease if not engendered is certainly spread and rendered more severe by the crowding of people into confined spaces. In a large printing establishment in this town where numerous employes work in large rooms more cases have occurred than in the whole population beside."—JOSHUA PARSONS, M.O.H., Frome.

"Seems to spread principally where there are large congregations of people, principally among factory operatives."—I. PRIDEAUX, M.O.H., Wellington R.S.D., Somerset.

"The women in the factories suffered as a body before the men were seized—an interval of about two weeks between them. At the same time there were a certain number of both sexes suffering."—J. MEREDITH, M.D., Wellington, Somerset.

"The first cases occurred in Millbay Barracks, Plymouth, on the 10th January 1890. Nearly as many men were attacked on January 10th as on any other day, and the disease continued to prevail from that date. The troops in Millbay Barracks were suffering from the epidemic for five days before any case occurred at the citadel, and so far the cases from Millbay have been more numerous and severe than from the citadel (the number of troops in both barracks being about the same). The citadel is on higher ground, and not near the slums of the town as Millbay is.

Among troops
at Plymouth.

"All the troops attacked in Millbay and citadel were treated in a ward in a block of buildings in the citadel, and though 50 men occupied the wards in the block both above, below, and alongside the Influenza ward, not a single man in the block was attacked. Elsewhere those affected were pretty evenly divided among the different blocks of buildings."—RICHARD D. BENNETT, Surgeon-Major, in medical charge of the troops, Plymouth, January 21, 1889. Communicated by W. H. Greenway, M.O.H., Plymouth.

"Inasmuch as certain families are exclusively attacked, I incline to the opinion that it is certainly communicable from person to person. In one case a person suffering came down from London and the rest of his family subsequently suffered. The occurrence of solitary cases in country houses also points to climatic influences in addition. A retired naval officer under my care has had a somewhat severe attack. He has been in correspondence with a brother in Birmingham who had it severely. The type is certainly not so severe here as reported in London

and other large centres. It does not exist as an epidemic in any of the trade establishments of the town, or schools."—T. W. SHORTRIDGE, M.D., M.O.H., Honiton.

"All the initial cases seemed connected with personal Christmas intercourse with London."

"(Later, February 9.)—Still continues to spread, extending much to the country farm-houses. Seems to spread by air-currents quite as much as by personal contact. Most attacks are on persons of out-of-door occupations, *e.g.*, police, excise, postmen, farmers, platelayers. In one isolated house Influenza attacked five persons in 24 hours, servants who had not left the grounds for 14 days, and so in the farms, generally adults, three or four are taken ill in the space of a few hours. The intervals of attack in households are most irregular, but about five or six days after one inmate is attacked the others are generally struck down if they are going to have the disease at all."—E. SLADE KING, M.D., M.O.H., Ilfracombe.

"February 9th.—I have not heard of any Influenza having distinctive features different from ordinary colds."

"February 28th.—During the last 10 or 12 days the epidemic called Influenza has affected this district. The cases have not been severe, but unmistakable. It seems to have specially affected the working men and servants. It is strange that the servants of the Devonshire Hospital have been affected, and not a single patient."—FREDK. TURNER, M.O.H., Buxton.

"Has been much more prevalent among men than women, and amongst those following outdoor employments."—W. M. BODY, M.O.H., Crediton.

"Those who are much employed indoors appear more susceptible than those who lead an outdoor life. Children get it very mildly, and quickly recover."—T. LEAH, M.O.H., East Stonehouse.

"Chiefly in the low-lying districts; the high lands of Dartmoor less affected (at first); the disease is reported very rife at Moretonhampstead, March 1st. Men suffer most, next children, and least of all women. There are hundreds of cases altogether, and some of the schoolmasters have decided to close their schools, the attendance being reduced one half. The disease runs through families frequently and must be contagious, yet many escape, and it is common to hear even medical men say that it is not communicable from one person to another. I estimate that already about 2½ per cent. of the population have had recourse to medical treatment, and the aggregate would probably be twice this."—W. HARVEY, M.O.H., Newton Abbot, combined district.

"It seems to spread by contact, and attacks people of lowered vitality, and generally takes the form of their particular ailment."—E. ROUSE, M.O.H., Northam.

"Arises sometimes spontaneously as though from germs conveyed in the atmosphere. At other times brought by persons who have visited infected localities or dwellings. Once in a house or district spreads rapidly and assumes an epidemic character. Personal contact with cases or entry into infected dwellings is not necessary. Intervals of attack in members of same family vary from two or more days to a week, sometimes two or more are stricken down suddenly. Invasion sudden; incubation (? prodromal) period short or absent. Attacks all members of communities equally. Elevated situations are freer than valleys. Insanitary or damp dwellings only influence production of sequelaë."—W. SNELL, M.O.H., Okehampton R.

"Infection by communication with neighbouring towns (Exeter, &c.) where I understand the disease prevailed before its introduction here. The disease has been particularly prevalent among the brush manufactory operatives."—F. A. GRAY, M.O.H., Ottery St. Mary.

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"Men suffer more severely than women, especially those men exposed to the weather. As regards locality the disease appears to be impartially distributed in town and country alike. The incubation period among children is very short, many seeming to be affected without warning in a few hours, the disease beginning with gastric irritation."—GEO. ADKINS, M.O.H., Plympton St. Mary R.S.D.

"The first cases were in a family from London who commenced soon after their arrival. Spread by infection. In only two families could I connect the dissemination; in all others it seems to have begun spontaneously; by this I mean some one member has begun without any direct contact with any person suffering from Influenza, and from this one the other members of his or her family have taken it. Damp localities tend very much to increase susceptibility. In most cases there has been an interval of incubation from two to five days in those cases where it has been transmitted from one of a family to others in the same house. I find it spread very much in schools. The mode of dissemination and incidence of the epidemic is most erratic, as in many of my cases I can trace neither infection from or contact with any other case."—P. R. LITTLETON, M.O.H. Asbourne R. & U. S.D.

"Commencement of extensive prevalence of Influenza December 18th, 1889. It was supposed to have been contracted in Leicester by the railway men from Rowsley sidings coming in contact with Leicester men suffering from the infection. In one continuous row of houses, 25 in number, at Rowsley, and about the same number at Darley Dale, all occupied by railway employés, the disease has been very prevalent among the men, and strangely, only one woman, the wife of one of the few men who have so far escaped, has suffered from the infection in a most severe form."—P. S. FENTON, M.D., M.O.H., Bakewell R.S.D.

"I have had a number of anomalous cases in which the patient has gone about feeling ill, and complaining of aches and pains in the head and back, but with no very marked catarrhal symptoms, but has recovered without keeping the house. The subsequent depression which has been a marked feature in the pronounced cases has also been noticed in these."—L. DRAGE, M.O.H., Hatfield.

"There is no very extensive prevalence in this district of 'influenza' such as appears in some other parts. Catarrhal conditions are very common; more so than usual even at this time of the year. Nearly all the cases I have yet seen of Influenza of any severity have been single, but other members of the same households have had catarrhal conditions, but without such marked symptoms. These latter have been thrown off in two or three days. The two most severe cases resembled my own in having had previous attacks of catarrh, which certainly seemed to render the nervous system prone to a severer depression."—J. S. COWLEY, M.O.H., Upton-on-Severn R.S.D.

"In one stable five horses suffered from 'influenza'; mucous membrane inflamed, cough, sore throat, discharge from nose, great prostration. The man attending these horses had an attack of catarrh, and his wife and five children were also attacked. The wife was the only one who suffered from severe frontal pain, neuralgia, and muscular pains and great weakness.

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"Two carpenters were working in the stable at the time the horses were ill. One had severe frontal pain, but no nervous depression or muscular pains; the other had but a slight attack of catarrh."—H. C. BURROWS, M.O.H., Southern Division, Newark R.S.D.

OBSERVATIONS as to the INCUBATION PERIOD of INFLUENZA.

The following pages exhibit in a condensed form the experience of a number of medical officers of health and other medical men as to the length of the incubation period of Influenza.

(In this table "incubation" means the period between a known exposure to infection and the appearance of symptoms of the disease. "Interval" means the period between one case and another in the same household. "Simultaneous" cases are cases in the same household commencing at the same time, or within a few hours of each other without known exposure to infection. "Concurrent" cases are cases developing after exposure to infection at the same time and from the same source.)

Observer.	District or Locality.	Incubation Period.
C. A. Patten	Ealing	Second case usually within 48 hours of first.
J. J. Ridge, M.D.	Enfield	Erratic, in first case apparently 1 day.
T. Günther, M.D.	Hampton Wick	Interval of usually 2 days between one case and another.
S. G. Litteljohn, M.B.	Hanwell Schools	2 days (in 2 cases).
G. Macdonald, M.D.	Southall Green	Interval between cases generally 4 days.
E. C. Roberts	Southgate	Incubation 3 days. (Monday to Thursday in 5 concurrent cases.)
A. Curtis	Staines	Interval 2 or 3 days; in 1 case 5 days.
A. H. Willoughby	Feltham	Intervals of attack 48-56 hours.
D. S. Skinner, M.D.	Willesden	Intervals of 14 days between 1st and 2nd, and 2nd and 3rd cases in his household. (But there were other sources of infection). "4 days."
C. H. Conolly	Wood Green	Intervals of 8, 11, and 13 days between successive cases.
C. E. Prior, M.D.	Bedford	Intervals between attacks about a week.
W. T. G. Woodforde, M.D.	Berkshire	24-48 hours intervals. 1 case 4 days.
A. E. Clarke	Eastfield	"Incubation 2 days or more." Intervals in families about 3 days from arrival of imported cases.
Dr. Phillips	Holloway Sanatorium	Incubation 7 to 10 days.
H. R. Ruckley	Wycombe	Intervals in families 2-3 days. In 1 case definite incubation period 3 days.

Duration of
incubation
period.

Observer.	District or Locality.	Incubation Period.	On Epidemic Influenza in 1889-90; by Dr. Parsons.
A. Gollaud	Altrincham	Intervals 3-5 days from first exposure in nurses; 12-18 hours in persons sharing room or bed; longer, (1-7 days) where contact not so close.	CHAP. XI.
J. S. Withers	Sale	Interval in 1 instance 5 days. Incubation 2 days after visit to infected house, not seeing patient.	
A. Craigmile, M.D.	Wallasey	"1 clear case within 24 hours after exposure to infection."	
T. A. Palm, M.D.	Wigton	Incubation 3 days from definite exposure. 3 days or less.	
W. H. Turton, M.B.	Heanor, U.	Intervals 1-7 days.	
F. Carter, M.D.	Billericay	Intervals in 2 instances 7 days.	
A. W. Wallis	Brentwood	Invariably attacks every member of a household within 7 days of first case.	
E. H. Carter	Chelmsford	"Incubation 1, 2 to 6 days."	
J. Taylor	Earl's Colne	Intervals 3-5 days.	
J. B. Bromley	Halstead	Incubation 2 days or more (1 case).	
F. J. Webb	"	Intervals 24-48 hours.	
F. Joy	Thetford	1-4 days, or simultaneous.	
H. P. Rowlands	Towyn	Interval 2 days (from arrival of a patient already suffering).	
F. F. Jones	Llanfyllin	Interval 4-7 days, or simultaneous.	
J. Phillips	Whitland	Interval 3 days (on 4th day).	
W. W. Williams	St. David's	Interval 2 days.	
E. Evans, M.B.	Llanelly	Interval 3 days.	
G. Neale	Cadoxton	In his own case rigor an hour after visiting 1st patient. Intervals in rest of family 3 days and 2 days.	
E. V. Pegge	Briton Ferry	Interval 1 or 2 days, or simultaneous.	
J. Lewellyn	Caerphilly	Interval 3-4 days.	
R. Prichard, M.D.	Cardiff, R.	"Incubation constantly 48-72 hours; commonly 48-60 hours."	
E. Walford, M.D.	Cardiff	Incubation in his own case 4 days, "next case a week later.	
C. B. Meller	Cowbridge	First case, head of family contracted Influenza in another town; others concurrently 5 days later.	
J. I. Bevan, M.B.	Oystermouth	Intervals 1, 3, 6 days.	
E. Davies	Swansea	Intervals within 2 days.	
J. W. Mulligan	Abersychan	In one household five cases concurrently, 8 days after head.	
W. E. Williams, F.R.C.S.	Abertillery	Intervals 3-4 days, not more than 7.	
G. Willis, M.D.	Monmouth, R.	"Incubation short, 24-48 hours." In one case 48 hours from kissing patient.	

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Observer.	District or Locality.	Incubation Period.
T. G. Prosser -	Monmouth -	Interval 3 days.
H. C. Bevan -	Nantyglo -	Intervals very short; within a day or two.
W. H. Davies -	Mynyddislwyn -	Interval 2 days from coming of a convalescent.
S. B. Mason, M.R.C.P.	Pontypool -	Attacks simultaneous.
G. A. Brown -	Tredegar -	Interval 24-48 hours.
D. Jackson, M.D. -	Hexham -	Interval 3 days from arrival of imported case; 48 hours.
F. Barrow -	Rothbury -	Incubation 2 days after exposure. Intervals 2-4 days.
A. Hardwick, M.B.	Newquay, Cornwall	Intervals in one family 24-36 hours; in others 4-7 days.
A. Ashby, M.B., and Reading Pathological Society.	Reading -	Intervals 24 hours to 6 days, often 3 days; 2 say "from a few hours to 10-15 days."
C. W. Iliffe -	Coventry -	Intervals 1-2 days to 2-3 weeks.
T. Benson -	Lanchester, R. -	Incubation short. Entire household attacked within a week.
J. Grant, M.D. -	South Shields, R. -	Intervals 1 week.
J. C. Munro -	South Shields -	In the few multiple cases, interval 6-10 hours.
J. Cunningham, M.D.	Sunderland -	Incubation short, 3 days or under.
C. F. Nursey -	„ -	4 days.
J. Atkinson -	Middleton, Teesdale	Interval 48 hours.
F. H. Homfray -	Staindrop -	Interval a few days.
J. Bourne -	St. John's, Weardale	Interval 3-4 days.
T. V. Devey -	Wolsingham -	Intervals about 3 days.
S. Gourley, M.D. -	West Hartlepool -	Interval in one family, 4 days.
A. W. Attwater -	Whickham -	Incubation, 2½ days from a definite exposure; intervals in households 2 days.
J. Harper -	Barnstaple -	Cases follow rapidly day after day.
M. Jackson, M.D. -	„ -	Interval a day or two.
H. M. Body -	Crediton -	Interval, about 4 days.
W. Gray -	Holsworthy -	Incubation 48 hours (2 cases commencing in 48 hours from arrival of patient).
F. A. Gray -	Honiton, R. -	Interval 3-4 days.
E. Slade-King, M.D.	Ilfracombe -	Intervals most irregular, generally within 5-6 days.
T. H. T. Mudge -	Paignton -	Incubation 1-4 days.
G. Adkins -	Plympton St. Mary -	Interval 3-4 days; incubation very short in children.
A. Pearce -	Salcombe -	Incubation 2 days.

Observer.	District or Locality.	Incubation Period.	On Epidemic Influenza in 1889-90; by Dr. Parsons.
F. M. Williams	Tavistock	Interval 2 days from arrival of a convalescent from London.	CHAP. XI.
G. W. Daniell	Blandford	"Incubation 4-8 days."	
W. Rendall	Dorchester, R.	Simultaneous or within 48 hours.	
E. J. Day	Dorchester	Intervals less than 24 hours.	
H. A. Lawton	Poole	Interval 2-3 days.	
V. Sandford	Ledbury, R.	Interval 3 days (6 concurrent cases in one house).	
J. Holroyde	Chathan	"Incubation 2-3 days."	
T. F. H. Smith, F.R.C.S.	Farningham	"Incubation within 2 days."	
A. B. Payne	Deal	Intervals 2-3-4 days.	
R. C. Studdert	Erith	Intervals 1-4 days or even 7.	
A. W. Scatliff	Margate	Interval 2 days-1 week.	
A. McLean, M.D.	Portland	"Incubation 5-6 days."	
E. Crossman, M.D.	Barton Regis	Incubation 2 days in 1 case. Intervals 3 days.	
H. B. Todd	Charlton Kings	"Incubation about 4 days."	
E. J. R. Macmahon	Northleach, R.	Intervals 3 to 5 days.	
G. Turner	Herts	Case having been present in school, January 3, on 6th, 15 children were absent, on 8th 18 more.	
H. Stott	Friern Barnet	Intervals 2 days, 24-48 hours. Intervals 10-12 days.	
P. Boobbyer, M.B.	Nottingham	Intervals very irregular in different stations, (a) 36 hours, (b) 48 hours, (c) 4 days.	
B. H. Mumby, M.D.	Portsmouth	Incubation usually 2-3 days, but in 27 cases under 24 hours.	
A. W. Pearse	Botesdale	"Incubation 4-5 days."	
E. G. Barnes, M.D.	Eye, Suffolk	Incubation 3 days from exposure to infection. Intervals 2 days, 3 days, (2 cases) 4 days.	
Wm. Lamb, M.D.	Arnold	Incubation 1 case 48 hours (or less) after arriving in infected house.	
J. T. Knight	Carlton	Intervals 24 hours and upwards, 5 days common. In 3 families (A) 3 days, (B) 10 days, (C) 9 days.	
R. Nesbitt	Sutton-in-Ashfield	Interval 2-3 days.	
S. G. Sloman	Farnham	Interval (A) 8 days, (B) 7 days (C) 8 days.	
C. Bourns	Oxted	"Incubation stage 3 days to a week."	
J. Morton, M.B.	Guildford	"Incubation 10 days."	
E. M. Shirlcliff, M.D.	Kingston	Interval 1 or 2 days, or cases almost simultaneous. Younger patients fail before older.	
M. O. Coleman, M.D.	Surbiton	Intervals 3-6 days.	

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Observer.	District or Locality.	Incubation Period.
E. Pocklington -	Wimbledon -	Intervals from 1 day to 1 week.
W. H. Square -	Stow R. -	Interval 3-5 days.
F. Argles, M.R.C.P.	Wanstead -	Interval often within 24 hours.
J. C. Thresh, M.D.	Chelmsford -	Intervals (A) 1 month, next case in 3 days, (B) 11 days, (C) 2 days, (D) 7 days, (E) 5 days.
E. J. Hunter -	Alverstoke -	Incubation very short, intervals 12-24 hours.
W. Hoffmeister, M.D.	Cowes -	Intervals uncertain, usually about 2 days.
C. J. Denny -	Blackwater -	"Incubation 2-8 days."
J. Rendall, F.R.C.S.	Lymington -	"Incubation 2-3 days."
J. Clapperton, M.D.	Stockbridge, R.	Incubation in 3 concurrent cases 6 days from definite exposure. Interval to next 2 days.
W. Bannister -	Havant -	In 2 families interval of 1 day, and then a succession of cases about a fortnight later.
W. F. M. Jackson -	Smethwick -	"Incubation 3-6 days"; later, "1 week or possibly 4 weeks."
F. M. Blumer, M.B.	Stafford -	Interval 48 hours.
E. Fernie, M.D. -	Stone -	Interval 2-3 days; incubation, 1 case, 4 days.
H. W. Gosse -	Eccleshall -	Incubation in one case, 5 days.
W. H. T. Winter -	Tettenhall -	"Incubation short 1-2 days, or even 8 hours."
A. S. Underhill, M.D.	Tipton -	Incubation in one case 4 days from definite exposure.
B. H. Herbert -	Uttoxeter -	Intervals 5-6 days.
J. Wood, M.B. -	Walsall, R. -	Intervals 3-4 days.
J. S. Wilson, M.D. -	Walsall -	"Incubation 1-3 days."
J. T. Hartill -	Willenhall -	In many households 1-4 other cases within 24 hours of first. In others, intervals (A) 1 day, (B) (2 cases) 2 days, (C) 5 days, (D) 7 days, (E) 5 days.
J. F. Porter, M.D. -	Helmsley -	Incubation in several cases at a school within 48 hours.
B. Lumley -	Northallerton -	Has proved incubation period to be something like 5 days.
R. Honeyburne, M.B.	Idle -	Interval (3 cases) about a week.
Dr. Crawford per J. McLintock, M.D.	Bradford -	Interval (2 cases in one family) 24 hours.
R. S. Morrison, M.B.	Cleckheaton -	Interval in 1 family 2 days.
J. Aldred -	Ecclesall Bierlow, R.	Very short, but cannot be defined.
J. B. Brereton -	Gildersome -	Interval 2-4 days.

Observer.	District or Locality.	Incubation Period.
J. Sedgwick -	Great Ouseburn, R. -	A. incubation 16 hours after arrival in Leeds. B. sister, 4 days after A's return home.
W. H. Cheetham, M.D.	Guiseley - -	Intervals 1-2 days.
D. Ainley - -	Halifax - -	Intervals 1, 2, and 3 days.
A. W. Scott, M.D. -	Handsworth, Yorks -	Interval 1-3 days.
B. Kemp - -	Horbury - -	Interval 1 day (A came home ill of Influenza (2nd day). Next day 2 others in family taken).
J. S. Cameron, M.D.	Leeds - -	Interval 48 hours.
S. T. Steele -	Morley - -	Intervals 2-4 days or up to 3 weeks.
B. C. Gowing -	Penistone - -	A had Influenza 6 days after return from London. B relative, 3 days later. C, doctor, 8 days after seeing A (? only twice). D, doctor's servant, 6 days after him, others in house escaped.
C. Dawson -	Rawdon - -	Attacks simultaneous, 1 day longest interval.
J. J. Rutherford, M.D.	Shipley - -	Incubation 4 days (3 concurrent cases 1 having removed in the meantime).
W. M. Burman -	Wath-on-Deerne -	Intervals 4, 6, 14, 23 days.
W. M. Jones -	„ - -	“Incubation 2 days.”
C. P. Gibson -	Wetherby - -	“Period of infection from 4 to 8 or 9 days.”
J. W. Mason, M.B.	Hull - -	Interval (4 cases) 48 hours.
R. B. Wrightson, M.D.	Aldeburgh - -	Interval 2-3 days.
A. Thompson -	Hadleigh - -	Interval indefinite, simultaneous, or 1 day.
G. S. Elliston -	Ipswich - -	Intervals—A, 13 days; B, 7 days; C, 6 days. (2 concurrent cases.)
J. S. Holden, M.D.	Sudbury - -	Interval about 2 days. One family of 13; all ill within 48 hours.
C. S. Kilner, M.B. -	Thingoe R. - -	Interval—A, 2 days; B, 3 days; C, 5 days; D, 3 days.
H. C. Kidd, M.B. -	Bromsgrove - -	“Interval 2-3 days, pretty regularly.”
H. Swete, M.D. -	Droitwich - -	Interval, in 1 instance, 4 days.
H. T. Preston, M.D.	Kidderminster -	3 cases in 36 hours, and 1 in 48 hours, from arrival of a convalescent.
D. Corbet - -	„ - -	Interval, 2 days.
G. E. Hyde -	Martley R. - -	Intervals—A, 1 in 4, and 3 in 5 days B, 3 days.
C. C. Smith, M.B. -	Redditch - -	Intervals 1-2 days.
E. Peacock -	Nuneaton - -	Intervals 1 or 2-7 days.
J. S. Baly -	Leamington - -	Interval 1 week.

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Observer.	District or Locality.	Incubation Period.
E. Carless, M.B. -	Devizes - -	Incubation 2 days and 3 days (several cases), from attending church service at which infected person believed to be present.
W. I. Keir, F.R.C.S.	Melksham - -	Intervals 5-12 days.
T. Clarke - -	Pewsey - -	Interval 2 days. Incubation, in several cases, 3 days after visiting Influenza patient.
F. W. Coates, M.D.	Salisbury - -	Intervals 7-8 days, or simultaneous.
J. A. Ensor - -	Tisbury - -	Intervals 4 days.
C. R. Straton, F.R.C.S.	Wilton - -	Incubation 3 days.
C. Kelly, M.D. -	Arundel - -	Interval 24-36 hours, or even under 24 hours. (Later) 2-4 days.
A. Newsholme -	Brighton - -	Incubation, 1 case, exactly 48 hours. Infective as late as 8th day.
P. E. Wallis - -	East Grinstead -	Interval, A, 8 days. B, incubation 7 days. C, Interval, 3 days or more. D, 2 days or less.
A. E. Vidler - -	Rye - -	Intervals, in 3 families, 1 or more taken ill day after first case.
C. M. Kempe - -	New Shoreham -	Interval 4-6 days.
C. E. Hollings -	Calverley - -	Intervals 2 days from arrival of imported cases.
T. C. Squance, M.D.	Sunderland R. -	Intervals 24-48 hours.
D. Duncan, M.B. -	Chester-le-Street -	Intervals 3-5 days.
J. Lawrence, M.B.	Darlington - -	"Incubation probably 2-3 days."
M. T. Kelly - -	Felling - -	Intervals 5 days.
W. Buchanan - -	Chatham - -	Interval 3 days.
R. R. Brown - -	Strood - -	Interval 2-3 days.
W. R. Grove, M.D.	St. Ives, Hunts -	Intervals of successive cases in 1 house 10 days.
J. Oakman - -	West Battersea -	Intervals 3 days.
E. Gwynn, M.D. -	Hampstead - -	Intervals 3 days.
G. A. Rogers - -	Limehouse - -	Intervals 1, 3, 4 days.
R. W. Jamie, M.B.	Ashby, R. - -	Intervals 3-4 days, or simultaneous.
E. W. Emms - -	Belgrave - -	Intervals 7 days.
R. Domenichetti, M.D.	Louth - -	Intervals 4 days to a week. (Elsewhere) 2-3 days.
C. J. Bernard - -	Skegness - -	Interval 3 days.
O. Giles - -	Sleaford - -	Interval 2-3 days or 24 hours.
E. W. Jollye - -	Donnington - -	Intervals 3-9 days.
B. Marshall - -	Atherton - -	Interval 4 days.

Observer.	District or Locality.	Incubation Period.	On Epidemic Influenza in 1889-90; by Dr. Parsons.
H. Welch, M.D.	Blackpool	A, interval 4 days; B, incubation 5 days from coming to infected house.	CHAP. XI.
T. Dean, M.D.	Burnley	Interval 4 days.	
J. A. Rigby, M.D.	Fulwood	Interval varies, 2 or 3 days to a week.	
A. W. Martin	Gorton	Interval 3-5 days.	
F. W. Jordan	Heaton Norris	Intervals, A, 8 days, B, 5 days.	
G. R. Parker	Lancaster	Intervals 4-7 days.	
G. K. Pitcairn, M.B.	Littleborough	Intervals 3-4 days.	
A. M. Eason	Lytham	Interval 1-10 days.	
B. B. Joll, M.B.	Much Woolton	In some families 5 or more persons within 24 hours.	
J. Niven, M.B.	Oldham	Intervals, A, 6 days, B, 3 days, C, 5 days, D, 6 days.	
T. W. Green, M.D.	Rawtenstall	Intervals 4 days.	
C. W. Thorp	Todmorden	Interval 1 week.	
W. T. Limrick	Waterloo	Incubation (1 case) 1 day.	
T. W. Thompson	Herts	Interval, A, 5 days (over 3), B, 3 days.	
W. R. Smith, M.D.	St. Albans	Intervals 18-24 hours.	
H. H. Back, M.B.	Blofield, R.	"Incubation 3 days or under."	
J. T. Waller	Fleggs, R.	Intervals 2 days to a week.	
S. H. Burton, M.B.	Henstead R.	In cottages all susceptible persons are attacked within 48 hours.	
A. C. Morton	North Walsham	"Incubation 2-4 days."	
W. W. Hardwicke	Harwich	Intervals about a week.	
H. T. Peskett	Leyton	Interval in one case 4 days.	
E. P. Gutteridge	Maldon	Interval 2-3 days. First two cases ill day after return from London.	
J. D. Priest	Waltham	Intervals 24-36 hours.	
S. B. Shadwell	Walthamstow	Intervals 1-3 days, generally 2. In one case incubation 3 days to first symptoms, and 4 to rigor (in another report "generally 4 days").	
W. H. Spurgin	Maryport	Incubation 1-21 days.	
P. H. Walker, M.B.	Lechlade	Intervals (a.) 3 weeks (children sleeping together). (b.) 3 days. (c.) 8 hours. (d.) 6 days.	
N. Hannah	Ashton-in-Makerfield	Intervals 1 to 3 or 4 days.	
F. O. Stedman, M.D.	Sevenoaks	Incubation 1-2 days. (Two cases) interval 3 days.	
J. Picken, M.B.	Rawmarsh	Intervals a few days to a week.	
C. W. Philpot, M.D.	Croydon	Intervals very uncertain.	
C. Oldman, M.D.	Bletchingley	"Incubation 2-10 days."	

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Observer.	District or Locality.	Incubation Period.
B. N. Earle, M.D. -	Winchester - -	Interval 24 hours. -
H. V. Rake -	Fordingbridge -	Intervals 2-7 days. -
C. V. Hitchins -	Weston-super-Mare -	Interval in 1 case, 4 days.
F. Stockwell, M.D. -	Bruton - -	"Incubation 4 days."
M. W. Roe -	Wincanton - -	Interval 5 days.
C. P. Coombs, M.D.	Castle Cary - -	Interval in one household 36 hours.
J. Hurley, M.D. -	Queen Camel - -	1 case attacked day after return from London.
E. O. Scallon -	Temple Combe -	Incubation 4 days.
L. B. Calcott -	Oundle - -	A. interval 3 days. Two people attacked on third day after arrival of visitor from London ill. B. interval, a week after arrival of convalescent. C. incubation under 3 days.
A. P. Kingcomb -	Towcester - -	Intervals 1-2 weeks sometimes.
T. R. Bailey, M.D. -	Bilston - -	Interval in one case, 6 days.
H. D. Ellis -	Brierley Hill - -	Interval in 1 family, 4 days.
C. Perks - -	Burton - -	Interval 3-8 days.
H. L. Webb -	Cheadle - -	Interval about a week.
S. Partridge -	Darlaston - -	Interval 2-4 days. -
J. B. Welch, M.B. -	Handsworth - -	Cases, if multiple, often simultaneous.
A. B. Great-Rex, M.D.	Kidsgrove - -	Interval 8-14 days.
J. J. Ritchie -	Leek - -	Cases where multiple simultaneous
J. H. Freer -	Rugeley - -	Do. do.

XII.—NOTES ON THE INFLUENZA EPIDEMIC BY
UNOFFICIAL MEDICAL OBSERVERS.

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CHAP. XII.

The following observations among others have been kindly sent me by medical men in response to a letter sent by me to the editors of the principal medical journals, and courteously published by them, asking for information with respect to the Influenza epidemic.

NOTES ON INFLUENZA from some 200 Cases, with Complications and Sequelæ, showing Infection, Incubation, and Behaviour of the Contagion, in corroboration of a Letter in the "Lancet," January 11th, 1890, by H. Howard Murphy, Twickenham.

Notes by Mr.
H. H. Murphy.

SIR,

As the epidemic of Influenza is now almost ended, and the nature and ways of the disease are being investigated, the observations of a general practitioner may be possibly of use.

To do my small share of this work, I send you the following list, showing the incidence of the disease in some 33 households in which 130 persons suffered from undoubted symptoms of Influenza. These are not all the cases I saw; there were some 70 more, but they were from various reasons useless for investigating the spread of the malady.

Influenza appeared in London in December, and was prevalent by Christmas in an epidemic form. Most of the families in this suburb have one or more members who go to London daily on business. They were, therefore, exposed to the infection there—(that the disease is infectious I think the cases following clearly prove). It was not possible to fix on the exact source of the infection or the precise time at which they were exposed to it in London; but we have certain knowledge of the day, and often the hour, in which they themselves became ill; we know that their homes up to that time were free from the complaint, and thus we have a certain starting point for observing the course and incidence of the disease in the other members of their families.

The most instructive cases are those occurring early, about the last week in December and the first week in January. Few people were affected, and it was possible to decide without doubt the source and time of infection. Doubly valuable are those instances in which there was only a single short exposure. The cases are arranged in three groups according to their importance as evidence.

GROUP A.—*Cases of Single Exposure.*

Household 1.—Mr. Q. goes to London daily. Was ill with Influenza on December 25th. No other case in this house till January 15th.

Household 2.—Mrs. A. called on Mr. Q. on December 31st, and had a few minutes' conversation with him. She was taken ill on January 3rd. There was a Christmas family gathering at this house, and this is how the other members were affected: Mr. B., January 6th; Miss C., Mrs. D., and Master D., January 8th; Mr. J., January 10th; Mr. H., January 11th.

Household 3.—Miss M. went to a party January 3rd. She had a few minutes' conversation with a young lady who said she was suffering

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from Influenza. Miss M. had a characteristic attack on the 6th January.

Household 4.—Mr. G. goes to London daily; taken ill January 5th. Mrs. N. visited him for a short time on January 5th, and was taken ill January 10th.

Household 5.—Miss R. saw a friend ill with Influenza on January 12th. She was herself affected on the 15th; her sister (who had not been with her on the 12th) was taken ill on the 18th.

Household 6.—Mrs. H. and family live a very retired life. The governess took the four children to a party on January 9th. Some other children there had just been ill with Influenza. On the 13th governess and one child ill; on the 14th two children, and on the 15th the remaining child.

Household 7.—Mrs. B. had callers on January 17th who had lately had Influenza. Mrs. B. was taken ill 21st January, and Miss B. (who did not see the strangers) on 25th January. I feel satisfied these six instances were single exposures.

GROUP B.—*Where Disease was brought from a Distance into a previously healthy Household.*

Household 8.—Mrs. R. G., living in the north of London, came here on a visit December 17th. On the 19th she was taken ill with Influenza, the first case that I know of in this neighbourhood. Mr. C. G. on the 23rd, servant on 26th, Mrs. G. 31st, and Mr. G. January 9th.

Household 9.—Mr. I. lives at his business place in London, taken ill December 20th with Influenza. His family reside here. Boy C. visited his father for a few days, and came back ill on January 4th. The other members of the family were attacked as follows: Baby, 8th; Mrs. and boy, 12th; boy, 18th; girl, 22nd; girl, 25th.

Household 10.—Master K. stayed a few days with some friends in London. They had been ill with Influenza. Returning home on December 31st he was taken ill. Four brothers and sisters ill on the 2nd January, Mr. K. on 3rd, child and two servants on the 5th, Mrs. K. on the 7th.

Household 11.—Mr. X. was taken ill December 30th. None of his family suffered, but he gives the following account: He goes daily to a large house of business in the neighbouring suburb, where as yet Influenza has not appeared. Many employés live on the premises. All healthy up to Christmas. One of them, Mr. V., went to visit his relations in London on 21st December, returned on 23rd, and was taken ill on 24th. Another, Mr. W., also residing at the business house, was seized on 27th December. On 30th December Mr. X. and five others in the same building were attacked; and later on four other cases occurred. It was not suspected that Mr. V. and Mr. W. had Influenza until the explosion of cases on December 30th, when inquiry was made and the fact ascertained which might easily have escaped detection otherwise.

Household 12.—Mr. Z. was one of the five mentioned in the previous note as taken ill on 30th December. He came home that evening. Mrs. Z. was taken ill January 3rd, a child on the 10th, another on 25th from a different source of infection, according to Mr. Z.

Household 13.—Mr. H. goes to London daily. Taken ill December 28th; Mrs. H. and a servant on January 2nd.

Household 14.—Mr. O. lives at a business house in London, where many were ill with Influenza. He was taken ill on December 27th, came

home here on 28th, and returned to London on 29th. A sister was taken ill January 1st, servant on 9th, another sister on 13th, another on 29th, and his mother on 30th.

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Household 15.—Mr. B. goes to London daily; came home ill January 2nd. On the 9th Mrs. B. and her parents, Mr. and Mrs. T., were attacked, and on the 18th a servant.

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Household 16.—Mr. C. goes to London daily. Ill on January 4th; Mrs. C. on January 8th.

Household 17.—Mr. A. goes to London daily. Ill December 21st, baby December 24th, servant January 4th, child January 25th.

Household 18.—Mr. G. goes to London daily. Ill December 29th, Mrs. G. January 1st, Miss G. January 5th, and Miss M. G. January 18th.

Household 19.—Mr. L. goes to London daily. Ill January 6th, servant January 9th, Mrs. L. 16th January, two children on 23rd, and one on 27th January.

Household 20.—Mrs. L.'s governess visited friends in London who had been ill. She was attacked on January 9th, Mrs. L.'s child on January 12th, Mrs. L. and another child on 18th, Mr. L. on 19th, and another child who had been kept as separate as possible on 29th, but it was thought he contracted it at a day school.

Household 21.—Mr. L., who lives in London, was taken ill January 11th. He came to stay with relations here on the 18th. One of them was attacked on January 21st, another 23rd. Mr. L. was therefore capable of infecting others on or after the eighth day.

Household 22.—Mr. P. goes to work daily at a neighbouring town; he was taken ill 8th January, child ill on 11th, wife on 14th, baby on 25th.

Household 23.—Mrs. W.'s servant went to see her mother, who was sick with Influenza at a neighbouring town on January 5th. This girl was taken ill on the 9th, was sent home on the 11th, and returned to her place on the 15th. Mr. W. was taken ill on the 18th, baby on 28th, and Mrs. W. on February 1st.

Household 24.—Mr. H. goes to London daily—taken ill on January 14th; baby ill on 19th, child on 22nd, servant 24th, child and another servant on the 25th January.

Household 25.—Miss D. B., absent on a visit, was taken ill with Influenza on January 14th and returned home January 15th. Mrs. B. was taken ill January 19th; both kept in their bedrooms for 10 days. A servant sickened on February 3rd, and a charwoman (who attended on her) 6th February.

Household 26.—Miss B., having Influenza, came to stay here with Mrs. S. on January 18th; her hostess was attacked on the 24th January.

(Households 1, 2 and 4, Group A., also belong to this Group B.)

GROUP C.—*Where the Source of Infection could not be determined or was Local.*

Household 27.—Mrs. W.'s child, who goes to school, was taken ill on 28th December, and a younger child, who is kept at home, on 31st December.

Household 28.—Mrs. D. (who thinks she got it shopping) was taken ill 2nd January, her daughter on the 5th, and Mr. D. on 6th.

Household 29.—Mrs. L. (who thinks she got it shopping), aged 80, had Influenza badly in 1847; similar symptoms, but much milder, on

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January 6th, 1890; Miss L. was attacked on the 10th, and servant on the 17th.

Note.—A former attack did not confer immunity after 43 years.

Household 30.—Mrs. B. (who thinks she got it out at work) taken ill 9th January, and her child on the 11th.

Household 31.—Mrs. F. (who thought she got it shopping) was taken ill January 10th, a child on the 14th, another on 27th.

Household 32.—Mrs. F. was taken ill January 22nd, a child on 26th, another on 27th, and a third on 28th.

Household 33.—Mrs. M.'s child was taken ill 23rd January, and the baby (who was kept at home) on the 28th.

I will draw my conclusions dogmatically—

1st.—That *the disease is infectious* seems clearly proved.

2nd.—The most striking point in looking through the list is the frequency with which the first symptoms occurred on the *fourth* day after exposure to a known source of infection.

The usual *period of incubation*, we may fairly argue, then, is *about 72 hours*. And the six cases of single exposure in Group A. show no case in which it is shorter, while in half (three) of them it was extended a day longer.

3rd. As to the power of a person to infect another there is every reason to think that this *begins with the initial symptoms* of chill, pains, &c., and the length of time during which infection *lasts is at least 8 days*, in ordinary cases. (See households, 9, 21, 23, and several others.)

4th. *The contagium is conveyed in the breath*—to all appearance—as the six cases in Group A show; for there is no rash or desquamation to suggest another way by which it could travel.

It does not travel far, for when the sick could be persuaded to keep their rooms, no fresh cases occurred until they got about the house again.

It is not very energetic nor hard to destroy, for in four houses where the first person sick was isolated, and disinfectants (carbolic baths, sheets, and spray, &c.) used as if measles were the disease, it was in no instance observed to spread. Many people exposed to the infection do not succumb.

It does not infect letters, clothes, or furniture, or, rather, I should say I could find no instance of its doing so, though constantly inquiring in this direction. Nor has there been any suggestion that it is spread by milk or water.

Clinically.—The disease is essentially a *fever*. In every case seen early there has been a rise of temperature, generally from 100° to 103°. A specific fever, for it breeds. After a few days it tends to subside with profuse perspiration, and in half the cases ends there. But in the other half it goes on to develop other symptoms, mostly catarrhs, rheumatic pains, and nervous symptoms with debility.

Complications and sequelæ.—In 200 cases there were no deaths; there has been one case of croupous (lobar) pneumonia; three cases of acute capillary bronchitis, with dry pleuritic friction also in each; two other cases of dry pleuritic friction with very little bronchitis. Many cases of slight bronchial catarrh. Many cases of slight stomachal catarrh; three cases of severe gastric catarrh; one with jaundice; two cases of severe enteric catarrh; about twenty cases of diarrhœa that required treatment. The great majority were constipated, and lost appetite for a

week or two. About eight cases of earache; three went on to otorrhœa; two cases of uterine hæmorrhage; one case of miscarriage. About a dozen cases of mild epistaxis; one slight case of hæmatemesis. Most cases had slight sore throat; three had moderate follicular tonsillitis; three persons were in a peculiar dazed stupid condition for about two weeks, unable to think or to do their work. Many slept badly, with vivid nightmare and dreams; ten had troublesome neuralgias.

Skin eruptions.—Five cases had sudamina, two had urticaria, two were said to have a "scarlet fever-like" rash in the morning before my visit, when it had disappeared. Two had a peculiar eruption about the 8th day of vivid red erythematous spots, each the size of a pea, aggregated in a patch; in one child behind the knee, in the other on each cheek, with a few additional spots on the forehead and forearms, almost symmetrically arranged.

Coryza was frequent, but mild and ephemeral. Seven people fainted—one child while I was listening to his heart—but all were liable to syncope. It was strikingly noticeable that the usually weak part of each patient seemed particularly to suffer when they were attacked by Influenza. Those who were liable to lung complaints had pulmonary troubles, those who were subject to stomach disorders got gastritis or enteritis, and so on.

Perhaps my conclusions may not seem warranted by the facts recorded; but it is impossible to put all one's observations into writing, even if space allowed it. Errors may creep in, for one has to depend often on the statements of patients, especially in private practice, and in the unusual pressure occasioned by the epidemic. But I have tried to avoid them by care, and to give as true and unbiassed account as possible, in elucidation of a new and difficult problem.

H. HOWARD MURPHY,
East Twickenham.

February 14th, 1890.

NOTES ON THE INFLUENZA EPIDEMIC AT WEYBRIDGE, SURREY; by
A. R. GRAHAM, M.A., M.B.

"I herewith enclose a few rough notes concerning the Influenza. I have not included notes of outbreaks in houses invaded later than January 10th, because by that time the epidemic had become so general that the possible source of infection of any particular case could no longer be traced.

"Where some symptom was prominent in a case other than those usually noticed I have generally noted it.

"Sneezing only occurred in a very small per-centage of my cases, likewise epistaxis. Children of any age were not exempt, although it was rare under three years. Case 48 was of course the youngest, and in that case the temperature was not taken. Male adults seemed the most liable, next female adults, afterwards elder children. Among children nearly all had gastric or intestinal disturbance, and a few had a skin eruption. In not a few cases there was tracheal or laryngeal pain with hoarseness and cough, and those cases were slow to mend. These cases were all adult females. Convalescence was more tedious in males than in females. I have noted 131 cases under my own care, and I saw a few other cases of which I have kept no record. One case, a lady of 66, terminated fatally on the eighth day from broncho-pneumonia.

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Dr. Graham.

"It will be seen that the first incidence of the epidemic was on gentlemen going daily to London, and secondarily, members of their households were affected before persons in other houses."

Date.	Case.	Remarks.
1889.		My first cases were two gentlemen on the Stock Exchange, going daily to London during the prevalence of the epidemic of enteric fever at the Stock Exchange, and in each case I was at first apprehensive that I had to deal with a case of enteric fever.
December 19	(1)	J. B.—An undoubted case of Influenza, as I saw afterwards when I came to recognise the disease. Temp. 101°·0. Lumbar aching, &c.
" 20	(2)	A. C.—Temp. 101°·5. Sickness, &c. I believe this case to have been also one of Influenza, and many cases subsequently occurred in the same house.
1890.		
January 2 -	(3)	T. T.—Inexplicable feverish attack. A gentleman who went up daily to "Lloyd's." The above cases were not at the time recognised as Influenza, as the disease was then unknown to me, but I have not now the smallest doubt that the first case at any rate was true Influenza. The next case (4) I recognised as Influenza; it was that of a gentleman going two or three times a week to the City, and whose work necessitates some travelling and long journeys occasionally.
" 5 -	(4)	E. M.—Rigors, &c., and a very tedious convalescence. See cases 36 to 40 inclusive.
" 6 -	(5)	E. V.—Returned to Weybridge two days ago, after two days' severe indisposition in London. Rigors and intense backache. Now very weak. Governess.
" 6 -	(6)	J. M.—Young Fellow of Trin. Coll. Cambridge, in the same house with (5). Temp. 101°·0. Pains worst in the fore-arms. Only a slight attack, rapidly passing off. Did not feel ill till January 6th.
" 6 -	(7)	S. M.—Sister to (6) and in the same house to which (5) returned. Temp. 101°. Pains worst in hands. Slight attack.
" 7 -	(8)	S. V.—School-boy, brother to (5) and again in the same house. Temp. 103°. Sharp attack, but not prolonged.
" 8 -	(9)	A. G.—Parlourmaid in the same house.
" 9 -	(10)	S. S.—Maid (ladies) " " " "
" 10	(11)	S. R.—Young woman " " " " who had only been there two or three days to help the invalid servants.
" 7 -	(12)	W. D.—Catarrhal symptoms with slight pneumonic congestion. This gentleman was daily at the Stock Exchange.
" 12 -	(13)	E. D.—Child of (12).
" 12 -	(14)	L. C.—Sister-in-law of (12). Laryngeal symptoms.
" 6 -	(15)	A. S.—Daily in the City.
" 7 -	(16)	L. D.—Has only been in Weybridge a few days, and has been doing much London sight-seeing. Her sister is reported to have had Influenza a few days previously.
" 8 -	(17)	J. C.—Wife of (2); but there have been many intermediate cases in the house under other medical care.
" 8 -	(18)	L. W.—A married lady. No other case occurred in her house, nor had she been to any other houses.
" 6 -	(19)	L. H.—Mother of a family. Some bronchial catarrh and subacute laryngitis.
" 8 -	(20)	V. H.—Gastric symptoms. (Æt. 11.) Child of (19). Two servants in the same house were attacked early in March.

Date.	Case.	Remarks.	On Epidemic Influenza in 1889-90; by Dr. Parsons.
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1890.			
January 8 -	(21)	D. W.—Young lady recently come on a visit.	
" 10 -	(22)	G. Y.—(Æt. 12.) Son of the lady with whom (21) is staying.	
" 10 -	(23)	L. W.—(Æt. 17.) Sister of (21), and came with her to Weybridge.	
" 24 -	(24)	M. Y.—(Æt. 15.) Sister of (22).	
" 9 -	(25)	E. W.—Lady going out a good deal.	
February 8 -	(26)	J. W.—Father of (25). (Æt. 82.) Severe, but transient attack.	
January 22 -	(27)	Mrs. W.—Maid of (25). (Another case in the same house, March 11th.)	
" 9 -	(28)	E. T.—Gentleman going frequently to business in London.	
" 12 -	(29)	R. T.—Daughter of (28).	
" 4 -	(30)	F. T.—Son of (28). A doubtful case.	
" 10 -	(31)	B. F.—Young gentleman going daily to London.	
" 15 -	(32)	Parlourmaid in the same house.	
" 18 -	(33)	Housemaid in the same house.	
" 10 -	(34)	P. R.—Gentleman daily in the City.	
February 11	(35)	R. H.—Cousin of (34) in the same house, and also daily in the City.	
January 10 -	(36)	Boy.—Young groom of (4) taking his meals in the house, and sleeping at the stables.	
" 10 -	(37)	E. M.—Wife of (4). Tracheal symptoms.	
" 10 -	(38)	Cook of (4). Laryngeal symptoms and sneezing. Relapse on the 13th.	
" 12 -	(39)	Kitchenmaid of (4).	
" 12 -	(40)	Butler of (4). Sneezing.	
" 8? -	(41)	C.—Cook in the house with the following cases.	
" 11 -	(42)	W. H.—(Æt. 17.) Sneezing.	
" 11 -	(43)	A. H.—(Æt. 12.) Brother of (42). Delirium.	
" 11 -	(44)	M. H.—(Æt. 9.) Sister of (42). Conjunctivitis.	
<p>January 11th was the first day on which I saw cases, excepting in the houses of the "well-to-do." On this day I saw in one cottage a mother and young child, and in another half a mile off a mother recovering and four children ill, in all of whom vomiting was a prominent symptom. The rest of the children and the father afterwards all had it.</p> <p>As a rule, when it broke out in a cottage, none of the inmates escaped, which was, I think, quite the exception in larger houses.</p> <p>I took no precautions of disinfection or otherwise, and on January 12th my eldest daughter had a sharp attack, and on January 15th my son had an attack with much sickness and diarrhœa. No other person in my house was attacked, nor had these two (so far as we knew) been exposed to chance of contagion.</p>			
" 15 -	(45)	D.—Child of 12. Diarrhœa.	
" 29 -	(46)	M. M.—Aunt of (22), and in the same house.	
" 27 -	(47)	Mrs. M.—She got better, and on February 3rd had a relapse.	
February 5 -	(48)	On February 4th she was confined, and next day the infant had much sneezing, with almost constant retching, although no food of any kind had been given to it.	

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Notes by Dr.
Caldwell Smith;

The following notes are sent me by Dr. CALDWELL SMITH, of Motherwell, Lanarkshire:—

The first case of Influenza that came under my observation occurred on January 6th, the symptoms being decided: high temperature and sudden onset were marked. Since then I have attended over 80 cases of the disease, and in all the cases the symptoms were much similar to the first. My next case occurred on the 10th, and was a very severe one, but no complications followed, the man recovering in 12 days.

I could not discover in these cases any source of infection. In the latter, the gentleman being a traveller, he might have been exposed to the infection, but in the first case, a woman, living a retired life, the most minute inquiries failed to elicit any source of infection.

Many of my cases occurred in the same household.

In one case, four of the family suffered; in three others, three cases occurred, and in a large number two only took the disease.

It was, however, remarkable that when one member of a family was affected, if another case occurred, it was invariably within 24 hours after I had been called in. That is, that next day when I called to see patient No. 1, if another case occurred at all, I had two patients to see instead of one.

This fact was so marked, that it could not but have forced itself on my attention, and I have not, so far, noticed that any observers have remarked the same.

This is interesting as regards the incubation of the disease. In only two cases could I trace infection. In one case the man had called to see the patient, and was himself stricken down within 36 hours. In another case, a woman went to see a friend, found her suffering from the disease, and only stayed half-an-hour in the house. In 36 hours her temperature was 102·5, and all the symptoms were marked.

Some particulars regarding the cases may be interesting.

(1.) *Sex*.—Males and females were equally attacked. As my practice is in a community where males predominate, I had more patients of male sex than the female, but I cannot say that the one sex had any greater susceptibility than the other.

(2.) *Age*.—My cases occurred mostly among young and middle-aged adults, men and women in the prime of life, and in good bodily health. Some of the adult males were models of health and vigour, never having had any ailment of consequence in their lives.

The youngest patient I had was a boy of 11, who recovered in four days. My oldest patient was an old lady of 72, who was very ill, and was seven days in a very precarious condition. She is only now convalescent, this being the 12th day since the first symptoms appeared.

(3.) *Condition in Life*.—Most of my cases occurred among the better working class. Very few in the professional or even shopkeeping class. One man, a puddler, took ill at his work, and had to be carried home, while the old lady previously mentioned had never been out of the house for seven days. She might, however, have got the infection by letter, as she has friends in Edinburgh, and had a letter from them two days before. At that time the disease was epidemic in Edinburgh. Particulars as regards symptoms:—

(1.) *Temperature*.—The highest temperature that I noticed was 103, but owing to the treatment adopted a temperature chart would be of little service. The principal thing to note was the suddenness of

the rise. In 3 or 4 hours the temperature rose from almost normal to 102° and 103°.

(2.) *Pulse*.—In most cases this was disturbed before the temperature; pulse of 120° and 130° common, even when temperature was only 100°, and after temperature came down the pulse remained quick for 48 hours, and in one or two cases for 4 days.

(3.) *Respiration*.—In my cases this was little affected, 22 to 30, but never over 30. Breathing regular.

(4.) *Digestive system*.—Tongue always foul and coated. Great thirst and nausea in most cases. In some gastric symptoms were very marked, and great pain over epigastrium was complained of.

Vomiting in nearly all the cases, but this only continued for 12 hours. Bowels obstinately constipated in all cases but one, where there was severe diarrhœa.

(5.) *Nervous system*.—Great pain over back and all along the spine. Head sore all over, and in bad cases pain in the eyes, or as one man put it "at the back of my eyes." Great nervous depression. Most of the patients had this for 3 days after temperature reached normal.

Sleeplessness marked.

Treatment.—In all cases I found that the first thing to aim at was free diaphoresis, and no drug was so valuable for producing this as Antifebrin. I gave five-grain doses of it to young adults and females, to be repeated in two hours if diaphoresis had not occurred. In strong adults I gave 7½ grains. In children two grains (only two cases under 14). After free perspiration the patient felt more comfortable. Temperature normal, but *there was a tendency to return of the rise of temperature the next evening*. This was most definite: it did not occur in those who did not get Antifebrin (six cases), but in these the temperature remained high over that day and to the next.

After the second day quinine in acid mixture was given, and in no case was there a fatal result.

I have made inquiries about "influenza" in animals, and have found that at two farms in the neighbourhood "influenza" occurred. In one case 14 horses, mostly young animals from six months to three years old, were affected, some of them very badly. This occurred in the first week of the year, but the farmer could not give definite dates.

DR. HARE, of Crouch End, in the north of London, sends me clinical notes of 15 cases in his practice at Crouch End.

Notes by
Dr. Hare.

The earliest case, a severe one, occurred on December 6th, 1889, and was a young man engaged in a large wholesale house in the City. The next cases, December 10th, were the wife of the first, recently confined (November 25th) and her nurse; these two persons had been practically confined to one room, their cases were mild. The 15 cases occurred in 10 households, 3 secondary cases having occurred in one household and 1 each in two others. In 5 the first case is recorded as a person going habitually to London. Dr. Hare remarks on the absence or late appearance of coryza, the constant presence of hacking cough, most frequently without physical signs of bronchial or pulmonary disease; the very marked frequency of pain in the eyeballs, often aggravated by moving them, and apparently situated in the muscles

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or tendinous structures of the eye. He had not found enlargement of the spleen in any case. He noticed in some cases very infrequent pulse during the period of prostration. He notes the proneness of the disease to affect fibrous structures, in this and in its reaction to salicin resembling acute rheumatism. He says, "With 20-grain doses of salicylate of soda every 3 hours you can promise relief from all pains in from 6 to 8 hours." He also gave iron, quinine, and strychnia in the stage of prostration, and found the cough relieved by cocaine lozenges ($\frac{1}{12}$ grain).

Dr. Hare believes that for every person laid up at least two have suffered abortive attacks, and have gone about as usual. He notices that for a month past many people had been subject to anomalous aches and pains which they were at a loss to account for.

Dr. SCOTT, of Bromley, Kent, sends the following notes:—

Notes by
Dr. Scott.

"1. *Earliest date.*—The first case of Influenza I saw was on December 21st, though I heard of one two or three days earlier. My patient was a man who went to London daily. The disease did not become general here till the first week in January.

"2. *Introduction from elsewhere.*—All the earliest cases were men going to London daily or their families. I have also a vague case of its introduction to a neighbouring village by a man who had been in Paris, and had there had the Influenza.

"3. *Incubation.*—On January 2 there were two dances (α and β) in the neighbourhood. α was in a house where several cases of Influenza had been or still were. At the dance β were guests who had had Influenza. Soon after, many of those who had been at these dances were down with the disease.

A. "*Family E.*

Miss E. had been at α .	Influenza began on January 6.
Mr. I. " " α .	" " " 6.
Mr. C. " " α .	" " " 5.
Mr. I. " " β .	" " " 5.
Housemaid nursed Miss E.	" " " 13.
Lady's maid " "	" " " 13.

B. "*Family N.*

Mr. N. had been at α .	Influenza began January 4.
Mrs. N. " " α .	" " " 4.
Mr. E. N. " " α .	" " " 5 (?).
Miss H. " " α .	" " " 6.
Mr. C. " " β .	" " " 4.
Mrs. H., who nursed Miss H.	" " " 13.

Also several others, whose dates I have not got, but which were just about the same.

"Other cases, indicating the length of the period of incubation, were—

C. Master P. develops Influenza on January 18.

Mrs. P., who nurses him " " 22.

Mr. P., who looks after Mrs., but had not seen boy, had Influenza on January 26.

- D. { Miss A. M. S. develops Influenza on January 2.
 { Miss S. " " " 2 (or 3).
 Mr. N. " " " 9 (or ? 8).

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The family then go away, but Mr. N. is nursed by the butler and two footmen (who naturally have seen nothing of the girls).

Butler and 1 footman develop Influenza on January 13.
 2nd footman " " " 14.

- E. Mr. A. G. S. } had been in London. Influenza on January { 5.
 Miss B. } { 6.
 Nurse } had not been in London. Influenza on January { 10.
 Miss — } { 11.

- F. M. and F. S. (children). Influenza on January 12.
 E. P. S. (father) " " 18.

In another family where seven had Influenza, the periods of incubation as far as I could make out were from two to four days.

In several other cases, of which I have not notes, the incubation period was about the same, from two to seven days. Generally about four days.

The following account is sent by Mr. J. H. WILSON, of
 Kenninghall, Thetford.

The Rev. E. S. G. went to London in good health on Wednesday, January 1st, and returned on Saturday, January 4th. His business took him on Friday, January 3rd, to a house where Influenza existed, but he did not do more than enter the front door.

Notes by Mr.
 J. H. Wilson;

On Sunday, January 5th, he conducted two services at church, morning and afternoon. On Sunday evening, 24 hours after his return home, he felt chills followed by fever, and he had intense headache next morning, and general feeling of prostration. On January 6th when seen he had a temperature of 101·5 in the morning, also slight nasal and bronchial catarrh and considerable pain in the loins.

On Tuesday morning, January 7th, the son of the above fell ill suddenly with headache, high temperature, loathing of food, and general malaise. He had been much in his father's company on the Sunday evening, when the latter was beginning to feel ill, but not earlier in the day. This would make the incubation period probably about 36 hours.

On Wednesday morning two other children fell suddenly ill with similar symptoms; on Friday two more, on Saturday one more, and on Sunday one more, and on Monday two more. The clergyman's wife and two servants were subsequently attacked, making 14 cases in all in this household, there being up to January 19th no other cases in the parish. [This would seem to show that the clergyman did not propagate infection in church when incubating the disease.]

In another house, three miles distant, a dealer came from London after a few days' stay there. He fell ill in less than 48 hours, and infected the family of adults, four in number.

Writing on January 13th Mr. Wilson says: "The only three houses where I know Influenza to be are in different parishes, and are where the head of the family has just returned from London."

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by Dr. T. P.
Thomson;

Dr. T. P. THOMSON, of Westbury, Shropshire, writes, February 3rd, 1890:—

“I have at present under medical supervision upwards of 50 cases of Influenza. Mine is a purely agricultural practice, and I have been very much struck with the fact that the farmers and their wives as a rule are the first attacked, followed in a few days by their servants. I put this down to their long drives to the markets of Shrewsbury and Welshpool; to their very often going all day without a substantial dinner, thereby allowing their system to get lowered; and to the bad sanitary state of Shrewsbury acting as a feeding ground to the germs of Influenza. In my opinion the disease is infectious and contagious.”

by Dr. J. E.
Sinclair;

Dr. J. E. SINCLAIR, of Princes Street, Storey's Gate, London, tells me that the first case of Influenza which he saw was in his own household, his child's nurse, who was taken ill on December 3rd with well-marked symptoms of the epidemic, and had a relapse on December 20th. The child who slept in the same room up to December 3rd and after December 8th, escaped. The only mode of infection that could be suggested was through a third person, who herself had not the complaint. On November 30th, a lady, who had just come from Paris, leaving her household there ill of “la grippe,” had gone into the nursery: she wore other clothes than those she had worn at home. The case was an isolated one in Dr. Sinclair's practice until on or after December 13th, when the general outbreak in his neighbourhood seemed to begin.

by Mr. J. Par-
sons;

The following case, communicated by Mr. J. PARSONS, of Frome, seems to fix the incubation period, if other sources of infection can be excluded, at about 34 hours:—

The little son (æ. 5) of a medical man is very fond of running into the surgery (a different house from his residence, but in the same street), but was as far as possible prevented from doing so during the Influenza epidemic. One Saturday morning, however, between 9 and 10 a.m., he escaped his mother's vigilance, and came in for a few minutes while the place was full of patients. On Sunday evening he went to bed complaining, and shortly afterwards had a severe rigor, quickly followed by a temperature of 104°, with the usual frontal and muscular pains. The symptoms lasted between 24 and 48 hours, and then subsided rapidly and completely. He was carefully isolated at home, and no other member of the household was affected.

by Mr. J. Q.
Costin.

Mr. J. Q. COSTIN, of Market Harborough, gives me the following history:—

On January 6th Mr. and Mrs. C. and two daughters went up to London and stayed at a large hotel until January 9th, when they left owing to Miss C. having been taken ill the evening before. On leaving Mr. C. was told by the manager that many of the servants at the hotel had been laid up with Influenza. There had been no Influenza previously at Market Harborough. On January 10th Mrs. C., who had been to London, was taken ill, and on January 14th Mr. C. and the other daughter.

Of the members of this family who had not been to London, the first to have Influenza was a boy aged nine, who was taken ill on January 13th, on which day a party was given at which the invalids attended, although very poorly. Several of the children of other families who were at this party had Influenza shortly after. The whole of Mr. C.'s household (12 in number) subsequently suffered from Influenza, except one servant, a weakly person.

A young lady staying in the house was taken ill on January 14th, and went home the same day, but none of the three persons in the household she went to took Influenza; one was an invalid.

A cat and dog in Mr. C.'s household also suffered from symptoms like those of Influenza.

Influenza commenced as an epidemic in Market Harborough about a fortnight after Mr. C.'s return from London, the town being attacked before the villages around, and more severely.

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XIII.—POSTSCRIPT ON THE RE-APPEARANCE OF EPIDEMIC INFLUENZA IN 1891.

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CHAP. XIII.
Recurrence of
epidemic
Influenza in 1891.

While this report is passing through the press a recurrence of the Influenza epidemic has taken place, about which it may be desirable to say a few words, although a complete history cannot be attempted. So far, information of the epidemic has come to hand only from Europe, the United States, and Egypt.

It has already been mentioned that certain local recurrences of Influenza took place during the latter half of 1890 in different parts of world, *e.g.*, at Killarney in Ireland, in Wurtemberg, and Australia. There seems also to have been a sort of smouldering of the disease in London and Paris; in London one or more deaths were attributed to "influenza" in every week in 1890, with three exceptions, and the number showed an increase in November, as shown in the table on page 105.

Meteorology of
winter of
1890-91.

The autumn of 1890 was fine, dry, and warm up to the middle of October, when it became cold and stormy, and there were some sharp frosts at the end of the month. The weather in November was generally fine and mild, till the 24th, when very severe frost set in, accompanied by heavy falls of snow and frequent fog, and this weather continued almost without intermission until January 23rd, 1891, a period of 59 days. In the month of December the mean temperature at Greenwich was only 29.8° F., it being the coldest December this century. The mean temperature of January 1891 was 34.1° , also below the average, and 9.3° below the mean of January 1890. February was fine and rainless, but with frequent fogs in London; in East Yorkshire, however (where I happened to be at this time), fogs were less frequent; the mornings were frosty and more or less foggy, but most days were bright and fine afterwards. The first week of March was warm and pleasant in London; in Yorkshire it was fine, with strong cold N.W. breezes. On March 9th and 10th there was a heavy snowstorm accompanied with a gale of wind; the snow was deepest in the south of England, particularly in Devon and Cornwall, where it caused a serious interruption to traffic; in East Yorkshire it was not very deep and had almost disappeared, except on the hills, by the 13th. The remainder of March and April were fine and dry, but with a prevalence of cold easterly winds, and the spring was very backward. The first half of May has been very fine and warm, the second half, cold and wet.

Recurrence in
Hull

and neighbour-
hood.

In England, Hull seems to have been in 1891 the first place to be attacked by the Influenza epidemic: cases were observed there about the last week in February, and the disease became epidemic towards the middle of March. Other places in East Yorkshire and North Lincolnshire, being in communication with Hull, were attacked about a fortnight later: the first cases being noticed about the middle of March. The neighbouring market town of Driffield suffered a few days earlier than the villages adjoining it.

Dr. Bruce Low, from whom I learn these circumstances, tells me that as regards the method of propagation the same results have been arrived at as last year, *viz.*, spread by direct contagion, and following the communications of persons from place to place. The origin of the epidemic in Hull is not known. From the week ending February 25th there has been a large increase in the number of emigrants passing through Hull, *en route* for America, and these comprise many Russian Jews (the number of whom has recently increased owing to the repressive measures enforced in Russia), who are often in a dirty and destitute condition. The emigrants, however, are medically examined at

Hamburg, and are not known to have introduced Influenza, nor, so far as I am aware, was Influenza epidemic in Russia so early as February, thought it has since been reported in newspapers on April 24th, as present and increasing in towns in Southern Russia.* Influenza broke out on the cattle-ship "Hindoo," on the voyage from New York to Hull (four days after her departure on March 5th), but Influenza is not known to have existed in New York before her departure, and it existed in Hull before her arrival. Possibly the Hull epidemic of this year has grown out of some local Influenza lagging on through 1890 and acquiring fresh potency in March. Dr. Anderson, of Loftus-in-Cleveland, states (through Dr. Stainthorpe, M.O.H. for the Guisbrough district) that in Skinningrove, a village in North Yorkshire, situated in a ravine, Influenza commenced about the middle of December, and had not entirely departed on March 18th. The symptoms were severe headache and other pains, sore throat, and bronchitis, and in some cases acute rheumatism. In the town of Guisbrough, about seven miles from Skinningrove, which also is shut in by hills, Influenza began about the end of February, and was prevalent to a large extent on March 20th. The other towns and villages in the district were at that time reported by medical men to be free from Influenza, other than the ordinary sporadic form.

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The Influenza epidemic was severe in Hull; the death-rate from all causes, calculated per 1,000 inhabitants per annum, which was 17·6 in the week ending March 7th, rose steadily until it attained a maximum of 42·5 in the week ending April 11th, after which it less regularly declined. Of the large towns, Sheffield was the next to be attacked, about three weeks later than Hull. Influenza is stated by Dr. Thomson to have broken out there in the second week of April and to have rapidly become epidemic; it was reported in newspapers of April 13th. The death-rate from all causes, which was 21·7 in the week ending April 4th, rose in the following week to 24·8, and mounted rapidly until it attained the enormous figure of 70·5 in the week ending May 2nd.

Early progress
of epidemic in
Yorkshire, &c.

The epidemic was reported at Leeds in newspapers of April 21st, and at Bradford on April 25th. The death-rate in those towns and in Liverpool began to show an increase in the week ending on April 25th. It was said that at that date it had not arrived at Huddersfield or Nottingham. By the end of April the Influenza epidemic was general all over Yorkshire, but at the towns and villages on the Yorkshire coast, *e.g.*, Bridlington, Scarborough, and Whitby, it developed later than elsewhere. It was also by that date generally distributed in Lincolnshire (the north of that county having been attacked earlier than the south), and in the parts of Derbyshire about Chesterfield.

By April 30th Influenza had appeared at Stockport, Ashton-under-Lyne, and other places in the neighbourhood of Manchester; in several districts of Mid and East Essex, at Canterbury, and Birmingham. (The "Morning Post" of April 8th states that Influenza was then at Birmingham, having reached that town from Worcester, but the same paper on May 5th states that the first cases occurred in the previous week, and other papers do not mention its presence there till April 30th.)

In London, the medical journals of April 18th and 25th mention the occurrence of a few cases of Influenza, but it does not seem to have been prevalent there until towards the end of the month; indeed, the

* Dr. Edson, physician to the New York Board of Health, is reported in the "Daily Telegraph" of April 14th, 1891, to have said that Influenza had been introduced there by steerage passengers from Russia, and he thought it probable that it would be introduced into England by the same means. Influenza is not reported at Hamburg till June 3rd.

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existence of the epidemic is denied in the "Daily News" of May 1st. A few cases of Influenza in the officers of Her Majesty's Customs are reported on April 29th; they were thought to have been contracted in visiting steamers from Yorkshire ports; by May 12th over 40 officers had been affected.

The epidemic seems to have fallen early and with special severity upon Members of Parliament and other persons in prominent positions, some of whom were attacked before the end of April. On May 15th it was stated that 77 Members of Parliament had been attacked. It was suggested that the infection might have been introduced by witnesses from Sheffield, who came up in large numbers in the latter part of April to give evidence concerning a railway bill.

On May 1 Influenza was reported in newspapers to be prevalent at Hampstead and elsewhere in North London, and at Woolwich; on May 5th, as prevalent in East London; and on May 7th, in South-East London; and at Edmonton, where special hospital provision had to be made for the sufferers.

The deaths in London attributed to Influenza which were 9 in the four weeks ending January 31st, 7 in the four weeks ending February 28th, and 8 in the four weeks ending March 28th, began to increase in April. They were in the—

Week ending	-	April 4th	-	11
"	-	" 11th	-	3
"	-	" 18th	-	9
"	-	" 25th	-	16
"	-	May 2nd	-	37
"	-	" 9th	-	148
"	-	" 16th	-	266
"	-	" 23rd	-	319
"	-	" 30th	-	310

In the Metropolis the number of deaths ascribed to Influenza as the primary cause in the weeks ending May 9th, 16th, and 23rd is much higher than that in any week during the epidemic of 1890; the largest number then having been 137; namely, during the week ending January 18th.

In other parts.

During May the Influenza epidemic is reported to be very severe at Loughborough; (May 1st, and later to have spread extensively in the villages in the Soar valley); also at Widnes, and among the slate quarrymen at Llanberis and other places in Carnarvonshire; on May 2nd at Nottingham, the first case having been imported from Hull; on May 6th, to be spreading in Buckinghamshire (where, as in 1890, the railway workmen at Wolverton were especially affected); on May 8th, at Pembroke Dock; on May 9th, to be very prevalent in Cardiff; on May 11th, at Shrewsbury and in Dorsetshire; on May 12th, in a Naval College at Devonport; on May 13th, in Flintshire and Denbighshire, and at Colchester; on May 14th, at Portsmouth; on May 15, at Pontypool and elsewhere in Monmouthshire, and at Kendal; on May 16th, at Wolverhampton, and at Camborne on May 23rd.

In Scotland

In Scotland a death from Influenza at Greenock (an introduced case) is mentioned on April 30th.

In the "British Medical Journal" of May 9th Influenza is reported to have re-appeared in a mild form at Edinburgh, and on May 23rd at Aberdeen.

and Ireland.

In newspapers of May 9th it is reported at Dublin, being thought to have been introduced by Members of Parliament returning from London; but the "British Medical Journal" of May 23rd denies its prevalence in Ireland.

It is stated in the "British Medical Journal" of May 16th to have reached the Isle of Man.

Abroad the earliest intimation of the recurrence of Influenza in 1891 comes from the United States, where it appeared early in March in Chicago, Pittsburg, Cleveland, and other towns in Ohio and Iowa, and spread thence eastwards, reaching New York about the end of March, and becoming epidemic in the beginning of April. In New York the number of deaths attributed to Influenza in the week ending March 28th was 4; in that ending April 4, 28; and in that ending April 11th, 108.

On April 18th it is reported to be very prevalent among the Indian tribes in Washington territory in the north-west of the United States. It was epidemic at Mexico by May 5th.

Few accounts of its presence have yet been received from the Continent of Europe. In newspapers of April 23rd Influenza is stated to be epidemic in Christiania, where 1,200 cases had occurred during the previous week. On May 23rd it was abating in Christiania, but was spreading in Copenhagen. It has also been epidemic at Gothenberg in Sweden ("British Medical Journal," May 2nd). On April 14th Influenza is reported to have occurred at Nuremberg, having been introduced from Chicago.

On April 24th Influenza is reported to be increasing in the towns of Southern Russia, Kharkoff, Kieff, Odessa, &c., and on May 15th also in Russian Poland. Influenza is reported as epidemic towards the end of April in Alsace and the Rhine district ("Standard," May 8th), and at Hamburg on June 3rd.

Cases of Influenza of a severe type simulating typhoid are reported in the "British Medical Journal" of April 25th, 1891, to have occurred in the interior of Portugal.

H.M.S. "Thunderer" arrived at Gibraltar from England on May 9th, with many of her crew down with Influenza. On May 13th the disease is reported as spreading at Gibraltar.

Cases of Influenza are reported in Paris on May 16th.

On May 19th Influenza is announced to have broken out at Cairo, and to be especially prevalent among the natives.

So far as at present known the epidemic of Influenza seems to have propagated itself in England in a similar manner to that of the year before, except that Hull instead of London was its principal starting point. We have not this year, any more than last year, witnessed the sudden development of the epidemic over a large tract of country; but, on the contrary, taking Hull as the starting point, the disease seems to have taken a fortnight to develop in the neighbouring towns and villages, three weeks to form an epidemic in Sheffield, a month to show itself in Leeds and Bradford, and about six weeks to invade London.* Nor do we hear of the whole population of a town being struck down at a blow, but rather of cases making their appearance in a scattered fashion (sometimes with a history of introduction), and increasing in number until they culminate in an epidemic.

The aggregation of human beings seems, as before, to have conduced to the development of the epidemic, and in some districts a wide extension of the disease closely followed a local assemblage of people. Thus at Louth, Dr. Best states ("British Medical Journal," April 25, 1891), that Influenza appeared to have been brought to the town by strangers attending the steeplechases, and that a few days afterwards a large

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Abroad:
In United States.

And on Con-
tinent of Europe.

Mode of spread.

* The epidemic, however, once it had established itself in London, seems soon to have become general throughout the country, as in the previous year.

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number of those who attended the races became affected with the disease. Again, at Lincoln, Dr. Carline states ("British Medical Journal," May 16th), that there was a great extension of the disease on April 27th, two days after the closing of the April Fair.

So far, therefore, the history of the present epidemic has shown no reason to modify the opinion expressed in the previous report as to the essential part played by human intercourse in the spread of the disease.

As regards the protective influence of an attack of Influenza, the general experience appears to be that persons who suffered from the disease last year have not been protected against it; some medical men even think that one attack renders the subject more liable to another.

As regards communities, no such rule at present is apparent. Yorkshire, which on the whole escaped comparatively lightly last year, has suffered severely now. Sheffield, however, suffered somewhat severely in 1890, and still more so this year. Driffield, which last year was reported to have escaped any special visitation of Influenza, and Hull, which seems to have been affected lightly then, have both suffered very severely now, while the village of Langtoft, where an early and severe outbreak of Influenza occurred in the winter of 1889-90, has, according to Dr. Bruce Low, got off lightly this time.

June 4th, 1891.

H. FRANKLIN PARSONS.

Notes by Dr.
Bruce Low.

NOTES BY DR. BRUCE LOW ON EPIDEMIC INFLUENZA IN 1891.

I have lately visited some districts in East Yorks and Lincolnshire whence reports had been received of a recrudescence of epidemic Influenza.

While in Yorks I heard that Hull, Beverley, Goole, Pocklington, Driffield, Malton, York, Tadcaster, Doncaster, Maxborough, Barnsley, Wakefield, Pontefract, Sheffield, Bradford, Leeds, Pickering, Kirby Moorside, and other towns had been affected. In East Yorkshire I was told that from Seamer, two miles south of Scarborough, to Hull not a village had escaped, but the malady had not shown such extensive prevalence in the places directly situated on the coast, such as Bridlington, nor had Scarborough suffered much.

In Lincolnshire I heard that Grimsby, Cleethorpes, Caistor, Brigg, Winterton, Scunthorpe, Barton-on-Humber, Market Rasen, Gainsborough, Louth, Horncastle, Spilsby, Alford, Skegness, Boston, and Spalding had suffered.

I made special inquiry of the medical men residing in Driffield as to dates of earliest cases in that locality. The general result of these inquiries was to fix the first noticed cases of Influenza in the middle of March, about the 13th, and inquiries made at Malton fixed the date of the earliest cases there about the same time. The town of Driffield appears to have suffered a few days earlier than the rural villages adjoining. Langtoft, which suffered very early in the epidemic 1889-90, seems to have suffered little on this occasion. There is considerable inter-communication between Hull and Driffield. Some merchants and others reside at Driffield, and go daily to Hull to business. There is an hourly railway service, and buyers come up to Driffield from Hull with goods. The medical men in Driffield believe Influenza came from Hull to Driffield. The first case in the latter town was in the person of a rate collector.

At Hull, Dr. Mason, the Medical Officer of Health, tells me there were recognised cases of Influenza during the last week in February,

and the disease was becoming epidemic towards the middle of March. The epidemic has extended into the third week in April.

I have no definite dates as to the precise time when the other Yorkshire towns were attacked, but there is a general belief that Hull suffered first, and that the disease extended from it to the other places.

In Lincolnshire the epidemic appears to have been rather later than the Yorks outbreak.

At Spilsby I obtained approximate dates of the first cases in the villages forming the sanitary district under Dr. F. L. Walter. The first village known to suffer was Aswardby, four miles north-west of Spilsby, on March 25th. Spilsby itself was not known to suffer till April 9th, and the first case was an innkeeper's wife. East and West Keal, where Influenza began during November 1889, had escaped up to April 24th in the present outbreak.

In some parts of Lincolnshire schools have been closed owing to Influenza, *e.g.*, at Barrow (near Barton-on-Humber), and at Ulceby (Brigg Rural Sanitary District), where it is stated the schoolmaster died later on from "Pneumonia following Influenza."

At Grimsby and elsewhere the demand for sick pay has been so great that some benefit clubs have suspended payment.

Medical men generally assert that the type of the present Influenza outbreak is of a more severe kind than that of the 1889-90 epidemic. And this opinion is supported by the number of fatal cases certified to have resulted directly or indirectly from the present outbreak.

The reports from various localities differ in some respects as to the leading clinical features, *e.g.*, some districts are reported to have more pneumonia associated with Influenza, others less than last year. Sheffield is mentioned in the latter, and Hull in the former.* At Doncaster the disease is said to be ushered in frequently with vomiting and diarrhoea.* At Wakefield Dr. W. H. Haley says that "the cases show more direct reference to the *Cerebro-spinal* system. In many cases the throat symptoms have been very marked." Dr. Best, of Louth, speaks of two varieties: (1) Bronchitis; (2) Catarrhal. In the former there is "profuse purulent discharge from lungs"; in the latter there is discharge from the nose, becoming purulent later on. He also mentions a case in which a patient, aged 40, became paralysed after an attack of Influenza last year. In the Pontefract district the newspapers speak of prevalence of sore-throats with Influenza.

The disease seems to have spread largely by personal contact. At Louth the malady is said to have become prevalent after a race meeting held near the town and largely attended by strangers at the beginning of April. Influenza seems to have affected all classes alike. At Driffield, although almost every house had been attacked, yet the work-house, which is a little outside the town, up to April 23rd had completely escaped. At Horncastle, on the other hand, there was an outbreak among the inmates, upwards of 40 of whom were attacked.

In the Driffield district there were three theories advanced of the way in which the disease had been brought to Hull:—

1. By the importation of large quantities of Russian linseed (some of which is brought to Driffield to the cake mills there). But inquiries as to this yielded negative results.

2. By the weekly arrivals of poor and dirty Russian emigrants (bringing with them infection) at the port of Hull, *en route* for Liverpool to be transhipped to America.

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* See "British Medical Journal," p. 929 (April 29, 1891).

Dr. Mason, Medical Officer of Health, was good enough to send me some figures bearing on this part of the question, and these I have appended.* It seems that from 100 to 200 Russian Jews arrive at Hull from Hamburg weekly, but they are medically examined at Hamburg and their passage notes endorsed. Dr. Mason says he has had no recognised cases of Influenza among the emigrants landed at Hull during the present year. The emigrants are sent on to Liverpool by rail for transshipment to America.

8. By the landing of sick sailors from freight-ships trading with New York and other American ports. In this connexion Dr. Mason says that occasionally Influenza cases have been landed of late at Hull. He mentions one instance from the S.S. "Hindoo" (cattle-ship) (42 hands) which sailed from New York on March 5. On March 9th a fireman was taken ill, on the 11th another, on the 13th a third, and on the 18th the captain was also seized. The first three cases were all fireman. The man attacked first (*i.e.*, on March 9) died on the 23rd of March from pneumonia (at Hull I understand).

The disease, however, had appeared in Hull before this, but Dr. Mason admits that Influenza illness may have existed in other ships' crews arriving before attention was called to the ailment.

Dr. Mason is about to prepare a report on the Hull epidemic, and full details of this and other cases will be given. He has given me certain further statistics which will duly appear in his report.

I understand from Dr. Mason that during the epidemic it was found that horses had also been suffering from illness, "the symptoms and development being similar to those occurring in the human subject." At Leeds, too, horses are said to have suffered severely. There was some special fatality it was said among 'bus horses in Leeds. At Pontefract horse-influenza has been rife. In the Rillington district (Malton Rural Sanitary District) "Pink-eye" is said to have been occurring in March, prior to the development of the human epidemic.

May 1st, 1891.

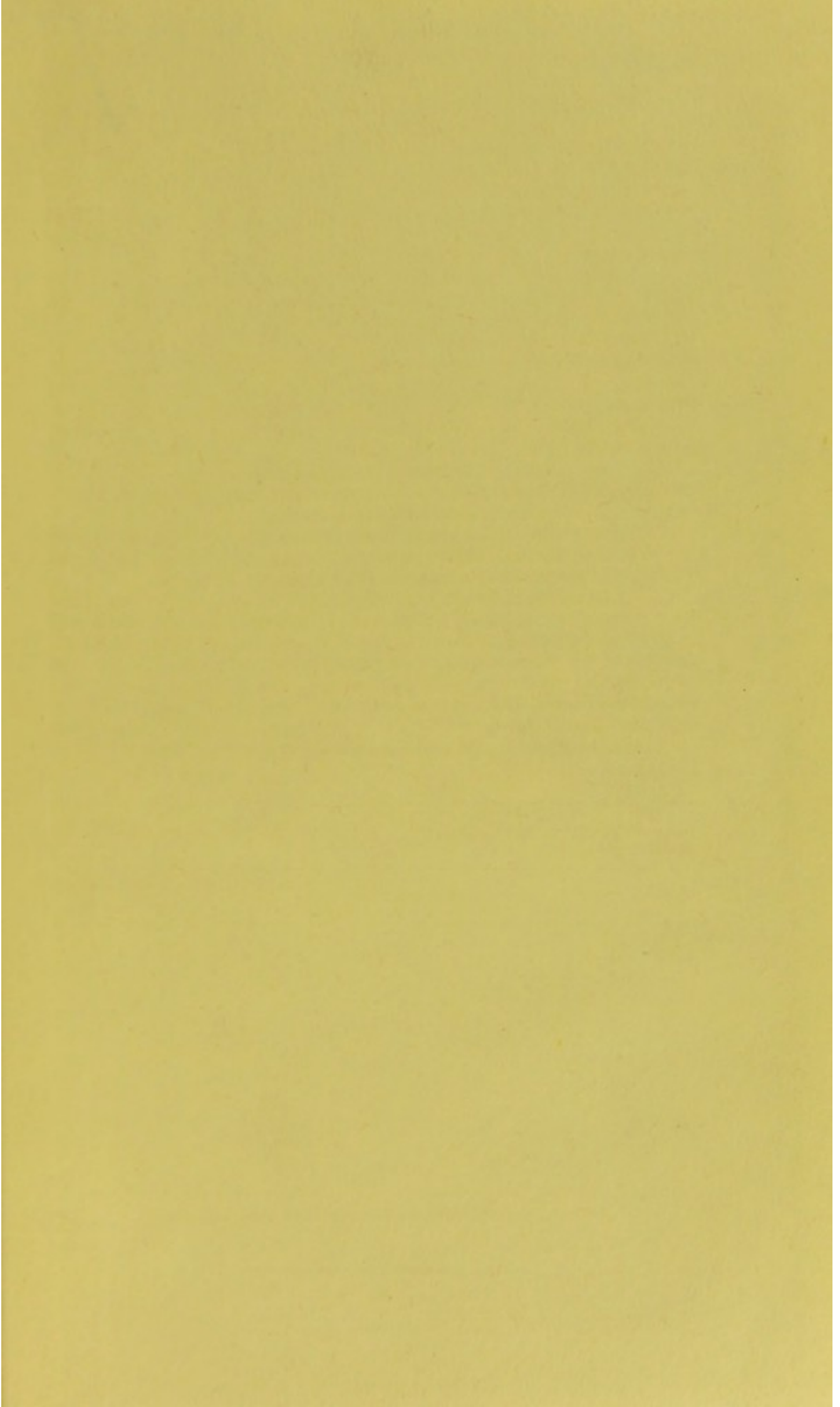
R. BRUCE LOW.

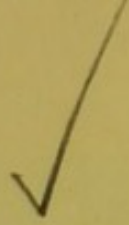
* Table showing the weekly number of Foreign emigrants landed at Hull and entrained for Liverpool "en route" for America.

Date, 1891.	Number of Emigrants.
January 7th	130
" 14th	206
" 21st	125
" 28th	208
February 4th	260
" 11th	365
" 18th	343
" 25th	866 ¹
March 4th	962
" 11th	1,971
" 18th	1,493
" 25th	1,762
" 31st	1,411
April 8th	2,100
" 15th	2,475
" 22nd	2,400
" 29th	1,827

¹ Approximate date of earliest recognised Influenza cases in Hull.







MAP SHOWING RECORDED DATES OF INFLUENZA EPIDEMIC IN 1889 AND 1890.

