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INFLUENZA.*

By W. T. GAIRDNER, M.D., LL.D.,

Professor of Medicine in the University of Glasgow.

GENTLEMEN,—When your local Secretaries did me the honour to request that I would make some remarks to-day upon the topic that is in every one's mouth—this being, in their opinion, a proper way of occupying (say) half an hour of your time at this meeting—I at once said to them that I could not engage to discuss the whole vast subject of epidemic influenza, but only to advert to some, mainly local, aspects of it, and in doing so to make myself the mouthpiece of others rather than to proclaim any new doctrines or views of my own. Presuming, then, on your being, in a general way, well informed already as to those characters of influenza as an epidemic (or, as Hirsch † well calls it, *pandemic*) disease, which have been gathered with such care and fulness into his important chapter on the subject, and which are further accessible to all of you in the work of the late Sir Thomas Watson, or in the admirable article by Dr. Parkes, in Reynolds' *System of Medicine*, I will confine these observations within such limits as may assist you in determining, if possible, the true signifi-

* An Address delivered at the Annual Meeting in Glasgow, on the 23rd January, 1890, of the Glasgow and West of Scotland Branch, British Medical Association, with numerous added documents, in evidence.

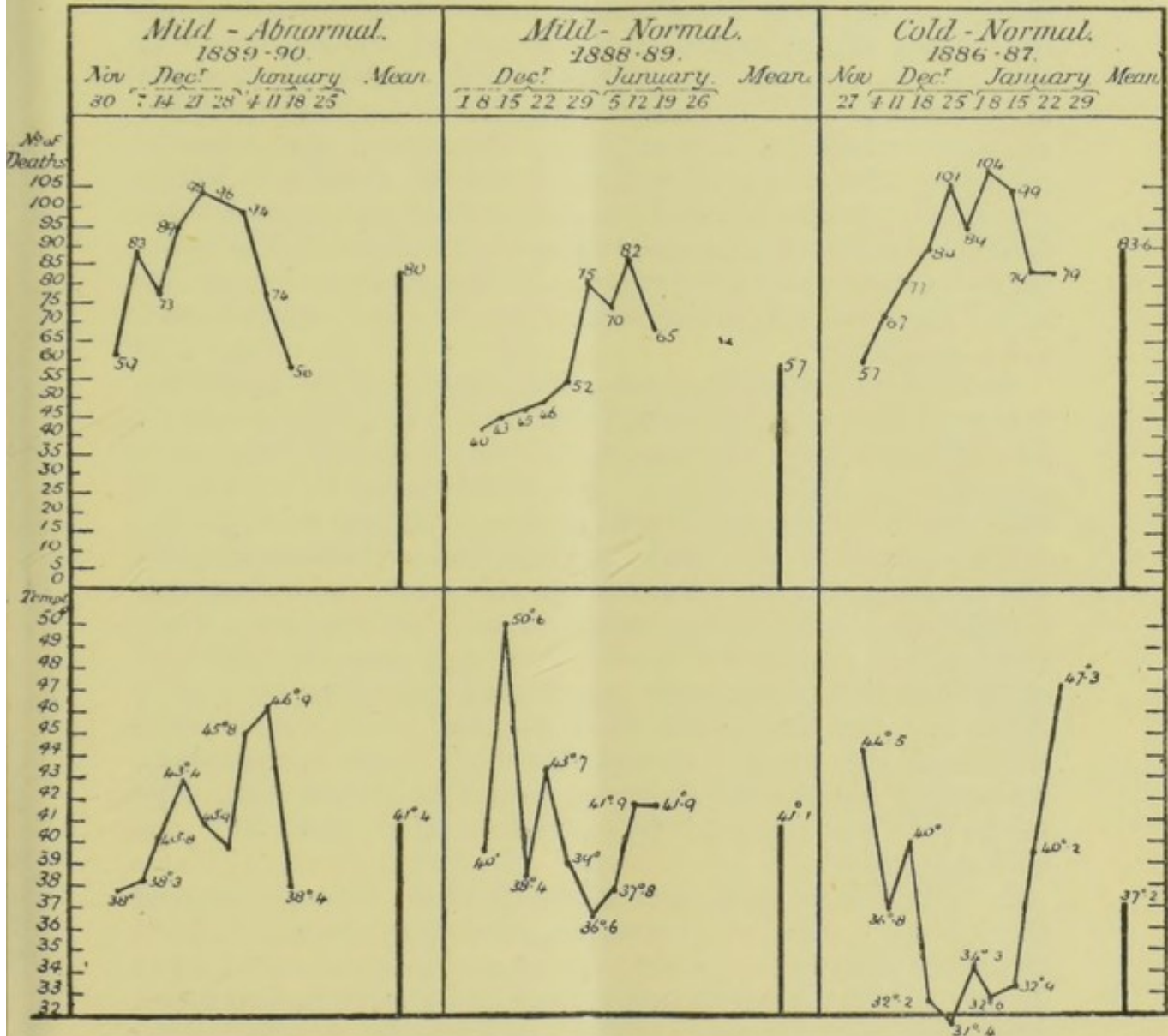
† *Handbook of Geographical and Historical Pathology*, by Dr. August Hirsch, New Sydenham Society, vol. i, p. 7.

cance of the facts that are coming to light, even now, among ourselves, in Glasgow and the West of Scotland. My own recollections of influenza extend back a pretty long way, and possibly this is one reason why it may have occurred to your Secretaries that I was the member that ought to be asked to speak on the subject. Of one or more epidemics in the "thirties" I have, indeed, a very vague impression derived from general conversation, and perhaps from suffering more or less in one of them, as a mere school boy. In 1847-48 I had to deal with a portion of a really great epidemic, which occurred when I was acting as a resident physician in the Royal Infirmary of Edinburgh. This outbreak, however, came not alone, but in the wake of other and most disastrous influences affecting the health of the population; the earliest in date being the failure of the potato crop, and the Irish famine of 1845-46, which, as most of you know, forced the hand of Sir Robert Peel, and obliged him to propose to open the ports for the free admission of foreign food-stuffs (the first step in the abolition of the Corn-laws) in December, 1845. The widespread occurrence of scurvy in 1846 was a consequence very directly of the failure of the potato crop, and an absolutely new fact in the experience of very many general practitioners; and the prevalence of dysentery, perhaps also of erysipelas, and latterly of typhus and relapsing fevers in 1847, were attributed to the scarcity and high prices of many most important articles of food in the two preceding years. In November, 1847, the influenza, which had been prevailing extensively on the Continent, broke out in London, and perhaps somewhat later in Scotland; and you may easily imagine that the joint effect of all these calamities was observed in many forms of severe and fatal disease, some of which (especially grave simultaneous inflammations of all the great serous membranes), I have elsewhere adverted to as being not only new to me at the time, but unmatched in all my later hospital experience. Of this epidemic, however, I have no notes now available, and have been accustomed in teaching to refer to the interesting and careful account of it by Dr. Peacock, as perhaps the most complete we have of any single epidemic of influenza in this country. In 1857 I witnessed a much milder, but still quite unequivocal epidemic, a brief contemporary account of which will be found in two lectures included in a volume entitled *Clinical Medicine, &c.*, published by me in 1862; and also in the *Edinburgh Medical Journal* for 1857-58. From that time to the present, except in my own class-room, in the ordinary course of duty, I have found no

occasion either to speak or to write about influenza. And if I have now been persuaded to do so, it has not been because of any great amount of new personal experience, but simply because the duty was laid upon me, as already stated. So far as observed hitherto, the present epidemic, which has been so widespread and fatal on the Continent, and which has been very notably present in London, and even in Edinburgh, has visited us, if at all, mildly and in a very scattered and rather unaccountable fashion. We are upon the fringe of the epidemic, rather than immersed in it. Of course, we have all of us seen cases, almost every winter, and not seldom also at other seasons, of feverish colds which we often call influenza, and which sometimes run into quasi-epidemic, and very probably more or less infectious, forms. Have we seen anything more than this upon the present occasion? My own experience, in hospital and elsewhere, though very carefully watched, following the lines suggested by the epidemic of 1857, appeared to me not to afford a decisive answer to this question. I therefore determined to issue circulars, which were posted just three days ago, to a number of medical friends whom I considered as fairly representative men in public and private practice, inviting them to submit to me in writing, in the briefest possible manner, such observations as I could be supposed to use, not in detail, but simply as a guide to my own mind in estimating the facts while addressing you to-day. I also placed myself in communication with Dr. Russell, at the Sanitary Office, and with Professor Grant, at the Observatory, and from each of them have received valuable, though very condensed, information. As the result of it all I now fully believe that I have myself witnessed cases that are in some measure the result of the epidemic influence; but I am bound to admit that they have been few, and for the most part not very striking or characteristic individually, and perhaps none of them so very typical as to deserve to be cited as examples of what people are calling, naturally enough, but not over wisely, *Russian* influenza, as if it were an entirely distinct or new disease. Well, then, does that prove the negative? Have we, or have we not, had with us the "Russian" or true influenza? The negative of this would be, I think, a very rash conclusion, because even Russian, or Viennese, or Parisian influenza, as it has been recently observed, is not, as regards its symptoms in individual cases, an entirely distinct, or at least distinctly recognisable, disease. Take the case, in some respects analogous, in others widely different, of "Asiatic" cholera as compared with its "British," or ordinary summer

form, witnessed in isolated cases almost every year in this country. I will engage to say that between an individual case of very severe or fatal home-grown cholera, and a case, isolated from its surroundings, of the Asiatic cholera or choleraic diarrhoea, there is absolutely no distinction as yet that can be securely drawn so as to constitute a diagnosis, unless we should find in the "comma-bacillus" the inevitable and sufficient distinctive mark of the latter disease only. But give me even twenty cases in succession of choleraic disease, and I know in advance, from experience, that "Asiatic" cholera will probably prove fatal to a third, or perhaps a half of them, whereas the summer cholera of these islands will, in the case of adults at least, have a relatively insignificant mortality. The distinction, in short, arises out of the epidemic conditions, and not out of the facts of single or scattered cases. Now, influenza is not a disease which, like Asiatic cholera, is fatal in a large proportion to those attacked; and, therefore, the distinctive element of *mortality* does not greatly help us here to grasp the problem. We are bound to admit, I think, that a very sudden and prostrating feverish cold, not fatal, and very transitory, as it may occur at any time in individuals, in Scotland, and apparently determined by exposure, is, or may be, as like an individual case of "Russian" influenza as anything can well be. Yet, in the fact of the latter being propagated over a whole Continent, and being followed easily in its progress from city to city, apparently without reference to climatic conditions, we have a distinctive peculiarity which we cannot refuse to look at, however little we may understand it. It is notorious, and well ascertained from the experience of centuries, that epidemic or pandemic influenza occurs and spreads almost indifferently in all climates, in almost all latitudes and longitudes, in all seasons, amid all prevailing winds or no winds, amid a variety of atmospheric conditions, in short, which make it almost impossible to suppose that these alone contain the secret of its prevalence. Under these varied and varying conditions it makes its way steadily over a wide area, so as to subdue whole populations to its influence, and even to affect very seriously the death-rate of localities through the enormous numbers attacked, although the proportion of those attacked that die, is relatively small. It is out of the question, I think, to suppose that a disease which, epidemically, behaves in this fashion, is identical with a disease which, non-epidemically and as an ordinary accompaniment of our winter and spring vicissitudes, is liable to be ever at home with us here in Scotland. Single cases of

the two may not differ greatly; but the epidemic conditions differ so much as to make it clear that we have two diseases to account for, and not one only.



DIAGRAMS (to be read as in connection with more complete numerical details in Appendix I, p. 26) showing, in the upper spaces, the Mortality from Acute Respiratory Diseases (Bronchitis, Pneumonia, Pleurisy); and, in the lower spaces, the Mean Temperature, as registered in successive weeks of December and January in three typical seasons (as explained in the text). [It should be noted, however, that the engraver has not quite accurately succeeded in adjusting the indications of the weeks to the temperature and mortality curves, so that in the two mild seasons the figures representing the Means do not correspond with the weeks below which they are placed, although the curves of mortality and of temperature in each case correspond. A reference to the actual figures in the Appendix will be sufficient to enable any one to correct this error in detail.]

Now, in endeavouring to apply these data, which may be regarded as historically true and well-ascertained, to the present occasion, I thought it necessary to attempt a hasty

estimate of the seasonal peculiarities of the present winter (so far as it has gone), compared with one or two others in our comparatively recent experience; and to connect with this the main facts of the death-rate as bearing on the question of influenza. Dr. Russell has kindly furnished me with a diagram illustrating this as regards three recent winter seasons—viz., the present one, an exceptionally mild winter (as you all know), and in other respects (as Dr. Russell has taken pains to show) an abnormal season; next, the winter immediately preceding, also very mild, but otherwise not abnormal; lastly, the winter of 1886-87, which may be taken as a type of what is usually observed in a really cold winter season. The comparison extends over seven weeks (Dr. Russell has subsequently added another week, which brings out the facts stated even more completely).

In 1889-90 there was a rising temperature in the first three weeks of December from a mean of 38° F. to one of 43.4° . At Christmas there was a quite moderate fall of 2.5° from this exceptionally high reading of the thermometer to a mean of 40.9° , and a further fall of 0.9° in the succeeding week, giving a temperature of 40° (still a high mean temperature) for the week ending 4th January. From this point there has been a gradually rising thermometer till now, giving, in the week ending 18th January, 1890, the very high mean temperature of 46.9° , as that of the week immediately preceding the present Address. On the whole, therefore, we have had, for the season of the year, a remarkably high mean temperature, amounting for the whole seven weeks to almost 42° . The minimum reading of the seven weeks was 38° , the maximum 46.9° .

In 1888-89 (a mild, but otherwise quite ordinary season) there was a somewhat greater range of temperature in both directions than in the present winter, and greater variations in detail; but on the whole a movement downwards in December, extending into January, so far, at least, as to affect very decidedly the first half of that month, with a tendency to a rise again in the third week of the month. Mean of the whole seven weeks, slightly over 41° ; minimum, 36.6° ; maximum, 50.6° .

In 1886-87 (a typically cold winter) there was a much more considerable range of temperature downwards than in either of the two seasons just mentioned, the upward range of the thermometer being intermediate between the two mild seasons, 1889-90 and 1888-89. Mean of the whole seven weeks, slightly over 37° ; minimum, 31.4° ; maximum, 44.5° .

But by applying to my colleague, Professor Grant—whose invaluable and long continued labours at the Observatory are always willingly placed at the service of the public, and are of first-rate scientific importance as meteorological data—I find that the peculiarities of the season of 1889-90 are by no means exhausted in the above statement as to its winter temperature. For it appears that—

First, the mean temperature, both of November and December 1889, was considerably in excess of that of a series of 22 continuous years commencing 1868; the excess in November being represented by 3.1° F., in December by 2° .

Further, *Secondly*, the rainfall in these two months of 1889 was quite exceptionally small, being only from two-thirds to three-fourths of the figures representing the mean of these 22 years for the like period.

Thirdly, the humidity of the air during the two months, November and December 1889, was very notably below the average of the 22 years just mentioned—to the extent, at least, of 3 to 4 per cent.*

Now, in what has hitherto elapsed of January 1890, the mean temperature may be taken as intermediate between November and December, 1889, and 2.6° in excess of the 22 years. But, on the other hand, the rainfall and humidity of January have been greatly in excess, not only of the average of 22 years, but also of the mean of November and December 1889. With this excess of rainfall we have had, as we all know, prevailing high winds, amounting, on at least two occasions quite recently, to gales of extraordinary severity even for the winter season, the phenomena of which were carefully and scientifically recorded by Dr. Grant in the *Glasgow Herald* on each occasion, in comparison with the greatest gales of many former years.

The summary, therefore, of the meteorological conditions with which we have to deal may be expressed as follows:—A winter of quite extraordinary mildness in respect of the mean temperature, associated in November and December with a low degree of humidity and a rainfall below average, and these, generally, with a relatively still atmosphere, these latter conditions being replaced, in January 1890, by an excess of rainfall and of humidity, with repeated storms of wind, in one of which thunder and lightning of a kind extremely unusual in January occurred over a wide extent of country; the high mean temperature, however, being still maintained.

Turning now again to Dr. Russell's diagrams, already referred

* See Appendix II, p. 27, for the details here referred to.

to, we are enabled to compare the progress of these meteorological conditions with the death-rate of the city of Glasgow, in so far as it is affected by acute pulmonary disease (*i. e.*, bronchitis, pneumonia, pleurisy), and is recorded from week to week by the Registrar-General. This comparison is carried out for each of the three selected winters already referred to as illustrating the typical phenomena of mild and of severe winter seasons respectively. The results of this comparison may be briefly stated as follows:—The movement of the mortality from the acute respiratory diseases since November, 1889, to the present date, *very closely resembles that of the exceptionally severe winter season of 1886-87, and differs entirely, in the direction of excess, from that of last winter, 1888-89*, considered as a mild ordinary season, though, on the whole, one with greater vicissitudes than the present—in the month of December at least. The mortality from week to week, in fact, during that month has exceeded by about 14 to 18—or, say, from a quarter to a third of the whole—the corresponding weekly mortality of 1888-89, and continues still in excess; while the entire curve of the mortality from respiratory diseases during the seven weeks bears a close resemblance to that of the exceptionally cold winter of 1886-87, in which the falling thermometer in December stands in such marked contrast with the rising temperature during that month and January, in the present season.

Now, there is nothing that is more clearly established by the entire past sanitary experience of Glasgow than the fact that a sudden and great fall of temperature during December (or, indeed, at any time in the depth of the winter), is almost always followed, or closely accompanied, by a considerable rise in the death-rate, especially due to the increase in respiratory diseases; while a relatively high temperature (contrary to the old proverb of the “green Yule”) is usually associated with a relatively low death-rate. In 1886-87 such a fall of temperature actually occurred in December, with exactly the usual result, as you will see from the diagram. In 1889-90, on the contrary, we have had a mostly rising temperature in December, continued into the present month (January) so far; but in the face of this rising temperature we have to account for a rising mortality from pulmonary disease, and a rising general death-rate, considerably in excess even of an average winter, and closely resembling that of the cold winter of 1886-87. In this respect, therefore, the present season is undoubtedly, when studied from the point of view of the death-rate, in association with its meteorology, a very exceptional one; and

we may, in the meantime, be content to lay firm hold on this as a fact, whether we ascribe it to the particular epidemic influence we are in quest of, or not.

It may be said, and has been said, no doubt, that the season has been "unnaturally" mild; that an unnaturally mild season is presumably an unhealthy season, just because it is unnatural; that people have been feeling oppressed, just as if it was summer, and dismissing their overcoats and their warm clothing; that any accidental cold or wet weather occurring under these circumstances is treacherous, and tends to beget disease; in particular, that the transition from a mild, calm, and dry winter in December, to an equally mild, but stormy and wet, month of January *must* have been unhealthy, and *must* have given rise to disease in any year, without an epidemic to help it; or, conversely, that a still air, such as we have had in November and December, *must* have favoured the occurrence of fogs, and the settling down of earth-born vapours, and (in Glasgow) of chemical and other contaminations, in a high degree, and therefore *must* have given rise to an unusual amount of pulmonary and more or less epidemic disease. The misfortune for these various and contradictory theories is, that however they may fall in with this man's or that man's prepossessions, they rest upon a very slender basis, or rather upon no basis at all, of evidence. As matter of fact, we have had very few considerable fogs in Glasgow during the part of the winter that has hitherto elapsed. The winter has been a remarkably mild and open one, but otherwise free from all remarkable incidents of weather, except the transition from mild and calm, in general (in November and December), to mild and stormy in the course of the present month. And, so far as the epidemic, or "Russian," influenza is concerned, there is remarkably little to show that in its peregrinations over Europe it has been guided at all to its destination by any of these circumstances of weather, or of season, just referred to. The particular case of London, however, under an unquestionable visitation of this epidemic "influence," has brought up at least one consideration which may just possibly receive a minor illustration in Glasgow, and to which, therefore, I will, for a moment, invite your attention.

In the *St. James' Gazette* of Tuesday last (21st January), there is an interesting and plausible, if not an entirely convincing, article on "The Decline of Influenza, from a Meteorological point of View."* My attention was directed

* It may be worth while here to place on record one or two of the statements in this well-informed, though anonymous, article in regard to

to this article by a very distinguished authority in the Medical Department of the Local Government Board at Whitehall, and I am not sure that its authorship may not reasonably be supposed to proceed from that quarter. The object of the article is to show forth a probable case (confessedly not a proved case), to the effect that, both in London and on the Continent, the growth of epidemic influenza has been accompanied and preceded by unusual stillness in the atmosphere,* and that its decline has been coincident with, and very probably due to, the replacement of stagnation by movement. "This would go far," writes the anonymous author, "towards explaining the vagaries of its geographical distribution; for

the London epidemic, which were not included in my spoken Address. A systematic inquiry on the 29th of December elicited at that time scattered cases of influenza in different parts of London, but showed also that it was not, apparently, present as an epidemic. On Thursday, the 2nd of January, however, "it was evident that the epidemic was fully established in our midst. For exactly one week it raged with constantly increasing severity, and then began to decline. On Thursday, 9th of January, the number of fresh cases all over London dropped significantly. The roll call of victims was smaller, and has continued to decrease ever since. This is a remarkably short period for epidemic influenza. In the Continental capitals it continued to increase in severity for many weeks. At Vienna, it first appeared in November, and did not begin to decline until much the same time as in London. So too in Paris. It looks as if the disease had been cut short here." The author, following in the track of all the experience gathered since 1580, concludes that "temperature has nothing to do with the matter. The following points have been examined with negative results: barometrical conditions, atmospheric humidity, ozone, direction of wind, electrical conditions, and volcanic eruptions." He also, after investigation, dismisses the rainfall as insignificant; but is disposed to attach considerable importance to stillness in the atmosphere, as an etiological factor, at least in determining the local prevalence of the epidemic.

* "During the last four months of 1889 there was very considerable stagnation of the air. This was first pointed out by M. Descroix, of the Montsouris Observatory. At Greenwich the aggregate horizontal movement of the air for this period was 5,846 miles below the average of the last sixteen years. The weekly movement was 344 miles (*i. e.*, nearly 20 per cent) below the average. During the autumn quarter (last quarter of the year) there were in 1889 only five strong gales; whereas the average number for the last sixteen years is about eleven, and in no one of these sixteen years were there so few as five. There was a heavy gale on the 7th October; but after that, very little. The week during which the epidemic established itself in London was a particularly stagnant one; but on the 5th of January there was a gale, and the wind continued to blow strongly all that week, with another gale on the 10th. During that week the epidemic began to abate. We have had windy weather more or less ever since, and the influenza has continued to decline." Almost exactly the same phenomena, according to the author, were observed in London in 1847; and there is, in his opinion, a rather strong presumption that the Continental experience, if fully and accurately investigated, would be found not very dissimilar.

that distribution would be commensurate with the area of stagnation, now wide and now narrow. The frequent mention, in epidemic years, of the occurrence of fogs, which, of course, imply still weather, corroborates the theory to some extent. That there have been still seasons, without the influenza, is nothing against the theory; but an outbreak during a stormy one would knock the bottom out of it at once. For the rest, it is worth consideration, if only because it agrees with all we know about the causation of zymotic disease. Stagnant air over a populous district is dirty air, and dirt is co-ordinate with disease." To which I will only add at this stage, that if the theory holds good as respects Glasgow and the West of Scotland, we ought to be, since last week at least, experiencing the benefits of the terrific gales with which we have lately been favoured, and thus illustrating another adage, perhaps of more real value than that of the "green Yule"—viz., that "it's an ill wind that blaws naebody guid."*

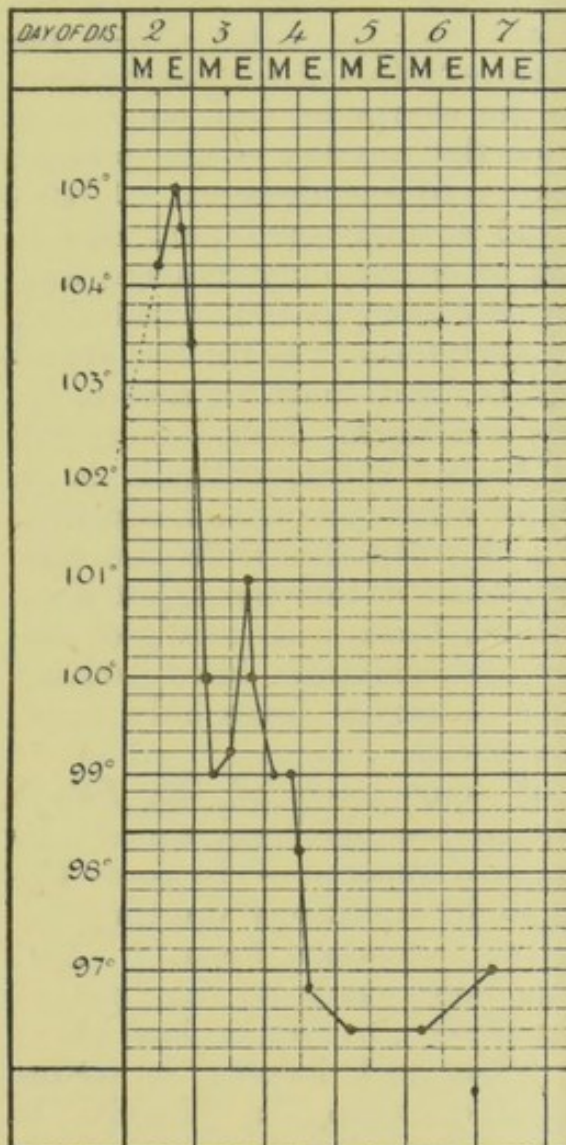
I now propose to submit, though necessarily in a very condensed form, some results of individual medical experience. Before doing so, however, let me say that, as I had myself never seen a typical, and at the same time unquestionable, temperature-chart illustrating the course of a case of epidemic or pandemic influenza, and as none such have been published, so far as I know (the epidemics both of 1847 and 1857 having occurred before the use of the clinical thermometer was established), I desired to have the means of placing before you to-day what might be regarded as a perfectly independent

* *21st February.*—The week immediately following the delivery of this Address (25th January), and now included in Dr. Russell's abstract of returns in the Appendix, already shows that the epidemic influence on the death-rate is on the wane, 260 deaths from all causes, and 56 from acute respiratory diseases, being recorded, as compared with 330 and 98 as the maximum of the epidemic period. This, too, in the face of a decidedly lower mean temperature, 38.4° , as compared with 46.9° in the preceding week. This change, however, in the temperature was the commencement of a period of much colder and more inclement weather lasting till the present time, and influencing the death-rate in accordance with all the usual precedents, as will be observed when the last weekly returns of the Registrar-General (15th February) is compared with the preceding weeks and with the corresponding week of last year. Thus, in the week ending 15th February 1890, there were in Glasgow 331 deaths from all causes, as compared with 257; and 102 deaths from acute respiratory diseases, as compared with 55 in the corresponding week of last year; the general death-rate being 32.5 , as compared with 25.3 last year at this time, and 25, 24, and 25 for three preceding weeks. But, with all this increased mortality from climatic causes, there is now little or no talk of "Russian" influenza. The special epidemic influence recorded in this paper seems to be almost, if not entirely, at an end.

contribution from a recognised epidemic centre, representing to the eye the normal course (as it were) of one or more select cases, observed as nearly as may be from the beginning to the end. Through the kindness of Dr. Bristowe and his resident assistant at St. Thomas's Hospital, Dr. Hawkins, I am now enabled to do this, and I hand round accordingly what I have no doubt you will regard as some very interesting illustrations of facts well known, indeed, to most of us from books and verbal descriptions, but not, in the case of most of us, so familiar in their strictly objective form, submitted (as Horace has said) to the "faithful eyesight." You will observe in these charts that the following characteristic facts are definitely displayed:—(1) very sudden invasion, with temperature rising almost at once (at all events within a few hours) to a maximum or acmé, which in the most characteristic, because the least complicated of them all, exceeded 105° F.; (2) a defervescence not quite so abrupt, but still so very precipitous in some cases, that twenty-four hours (or a little less or more) suffices to reduce the eminently febrile temperature of the acmé to normal, or even markedly sub-normal; (3) in some cases oscillations (which in one instance now before me* extend to 6° , and even 7.2° F. within twenty-four hours) followed after two such repetitions by a sudden drop from 104.8° (the absolute maximum in this case having been 105.4°) to 96° F., the whole febrile period extending over fully seven days, and being complicated with pneumonia of the left base, but with an uninterrupted and apparently rapid convalescence. It might, of course, strike you that some of these sudden changes were dominated by the remedies employed (in several cases sod. salicylat., in some antipyrin, in one quinine); but fortunately for our purpose, the most characteristic chart of all (here reproduced with all its details) is absolutely free from any such cause of disturbance, and may be taken to represent the most uncomplicated course of pure influenza of the epidemic kind, in a young and previously healthy subject, *without even the usual accompaniment of catarrh*. This last negative character is shown in several, even, I think, in the majority of these charts, if one may trust the descriptive notices attached to them, which expressly say in several that there was "no catarrh;" in one, only injection of the conjunctivæ but no other catarrhal symptom; in another, "con-

* I have here modified the verbal description as given in the Address, in accordance with a considerable addition to the number of charts transmitted to me after the Address was given, and now making *nine* in all. The most characteristic of all, however, possibly is the one here engraved.

junctivæ injected, no catarrh of nose or lachrymation;" in yet another, only "slight cough." Of course these charts may perhaps be regarded as to a certain extent selected, so as to show forth the disease in its least complicated forms. They show, however, at all events very clearly, that the sudden and



TYPICAL CASE OF INFLUENZA.

London Epidemic of 1889-90.

R. B. W. (student), æt. 23.

22nd December.—Was playing whist. Quite well up to that moment; then head got hot, felt giddy and feverish; fanned himself, then felt cold; later, headache, anorexia, and aching of limbs.

23rd December.—No sleep last night; vomited once. No catarrhal symptoms. Slight dryness of throat. Severe headache. Complete anorexia. Limb pains gone. Conjunctiva and eyes normal. No signs in chest or abdomen. Tongue white, thin plastered fur, flabby, moist.

24th December.—Nearly well. Headache nearly gone. No appetite.

25th December.—Quite well.

26th December.—Discharged.

[N.B.—A very sudden rise of temperature to 105° F., with all the symptoms as of a very serious invasion of a specific fever.

Equally sudden defervescence, without any notable complication, either in chest or abdomen.

Temperature subnormal from fourth day.—W. T. G.]

CHART showing the course of the temperature in a perfectly typical and entirely uncomplicated case of Influenza, as observed in St. Thomas's Hospital, London, during the present epidemic. The details of the case are noted in the margin.

every way remarkable changes of temperature in this disease are not dependent upon, or even necessarily associated with the local complications, or with the catarrh as the most common of these.

Now, all this, though new to many of us as thus displayed to the eye from accurate readings of the clinical thermometer,

is quite in accordance with some of the classical descriptions of influenza in previous epidemics, when the thermometer was not in use; and I may add that my own experience, as carefully set down in 1857 for the instruction of a clinical class, was in every point identical with that of Dr. Bristowe to-day, in so far as the comparison can be pursued without thermometric details. In particular, the suddenness of the invasion and the almost equally sudden defervescence are referred to in the following terms:—"Most of the cases I have seen have been remarkable for the sharpness and suddenness of the attack, and not less so for the rapidity of the passage from a state of feverish prostration to convalescence. I have found a man with a pulse of 130 at night, and next day he has been up and about. This, of course, only happens with sound constitutions" (*Clinical Medicine*, p. 99). And after an enumeration of the leading symptoms, it is further stated that "though catarrh is frequent, and may be severe, *the disease is essentially a fever, not a catarrh*. Nay, the catarrh may be absent or insignificant; not infrequently it is so . . . even in the very cases in which you would, *à priori*, expect its occurrence" (p. 100). I will not trouble you now with the details given in illustration of this point, but they struck me very much at the time, because so many of the systematic authors, guided by nomenclature, have written about influenza as if it were a catarrhal fever only; and, indeed, mainly a catarrh, whatever else.

This negative peculiarity of some cases of the *Febris catarrhalis** was not unknown in the older epidemics. In that of 1782, for example, Dr. Gray reports:—"In some the catarrhal symptoms were very slight or entirely wanting, the disorder in these cases being like a common fever."† And writing only the other day, from notes made at the time of the last great epidemic of 1847-48, Dr. Wilks has given prominence to the same fact. "You will observe," he writes to Dr. Sisley, "that 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*." Dr. Sisley, in publishing this communication, further emphasises its significance in reference to the present epidemic in London as follows:—"It has been thought by some physicians that the present epidemic is not one of influenza because *in a very*

* Otherwise *Catarrhus epidemicus* or *Rheuma epidemicum* (Sauvages); *Catarrhus a contagio* (Cullen).

† *Annals of Influenza*, by Theophilus Thompson, M.D., &c., p. 124.

large number of cases there are no catarrhal symptoms." * He also adverts to the pericardial inflammations noted by Dr. Wilks in 1847; † to the characteristically acute pains in the head, neck, and back, leading to a suspicion in some cases of "some acute disease of the spinal cord or of its coverings;" to the pains in the joints, simulating rheumatic fever, but without swelling; and to the rapid defervescence. "I have known," he writes, "the temperature to fall six degrees Fahrenheit in a single night," with profuse sweating. ‡

Among the numerous communications I have received on the present occasion, there are a few which may be characterised as altogether sceptical with respect to any special epidemic influence in Glasgow of late; and more than one correspondent writes as if the whole "scare" arose from the newspapers telling us so much about it. It has even been humorously affirmed that influenza attacks only the persons who live by salaries, and not those who are in receipt of daily or weekly wages. No doubt there are in this, as in the case of all other diseases which are much talked about, persons who only fancy themselves ill of the popular complaint. But on the other hand the phenomena of the death-rate, as I have already shown, make it difficult to maintain fully this sceptical attitude. There is beyond all question *something* that is weighing unduly on the death-rate, especially of acute respiratory diseases. What is that something? till we have

* In a short paper just received from Professor Bäumler, of Freiburg, reprinted from the *Münchener Medizin. Wochenschrift*, 1890, No. 2, the same fact is clearly brought out as the result of personal observation of the present epidemic on the Continent of Europe. "It is particularly to be remarked," he writes, "that not a few cases run their course without any catarrhal phenomena as regards the air passages. Sudden fever, with abrupt rise of temperature, but for the most part without shivering, with a range up to 40·6° (105·8° F.) and more, for several hours together, frequently at first vomiting, sometimes diarrhoea; pains in the limbs and general prostration; in the height of the fever marked injection of the face, conjunctivæ, and mucous membrane of the throat—such is an ordinary picture of the disease. Sometimes, even after 24 hours, a fall of the temperature to normal, usually with sweating, so that in many cases the disease runs its course under the aspect of a true ephamera. In other cases catarrhal appearances present themselves from the first, often commencing at the larynx, with sense of pain and a harsh barking cough, and from this extending both upwards and downwards, sometimes with early appearance of catarrhal pneumonia. In the cases with catarrh the fever remains for several days or longer." All this is strikingly in accordance with the London experience as here cited.

† See also my *Clinical Medicine*, p. 101, as regards this and other severe and fatal forms of inflammation of the serous membranes.

‡ The *Universal Review*, 15th January, 1890, pp. 23, 24, and 32, 33.

settled that point, it will not do to merely *pooh-pooh* the influenza. It may be admitted at once that there are great, even extreme and unexpected, anomalies of distribution, and that it is extremely difficult or impossible to dovetail the facts which are now before us into any ready-made hypothesis or all-embracing theory, of the mode of diffusion of the disease.* It may also be readily admitted, I think, that we are not so much *in the midst* of an epidemic, as *upon the edge* of one, so far as Glasgow is concerned. Naturally, under these circumstances, the disease, when it affects the more affluent classes, attracts much more notice than among the poor in their own homes—*carent quia vate sacro*. It is not at all improbable that mild attacks of the disease among the less favoured classes may take place, and may run their whole course, not only without medical attendance, but without material interruption to the daily discharge of duty; and that admission to hospitals in such cases is quite exceptional, owing to the transitory character of the worst symptoms. The comparatively small prevalence of the disease in most of the public institutions, however, and in the common lodging-houses, is a curious, and even a staggering fact in some respects, in endeavouring to apply previous theories; but ought not necessarily to make us too distrustful of positive facts and statements, such as I shall now venture to submit in the most condensed form possible; and, as a rule, without giving individual names of correspondents in private practice.

1. Several of our professional brethren and friends have placed at my disposal some details of acute attacks in their own persons of what they consider to be influenza. Two of

* Dr. Bäumlér, after careful observation of the mode of diffusion of the epidemic both in the town and the hospital, dismisses both the "miasmatic" and the "contagious-miasmatic" hypotheses, and considers the disease as a purely contagious one, with a very intense power of infection, and a very brief period of incubation. He has failed to observe, however, in his own limited and well-defined experience, any of those sudden explosions ("like thunder and lightning storms") which have been so often described. The details he gives on this point are interesting, and serve to confirm an impression I have 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 discovered; 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. See an article by Dr. R. S. Thomson, in the present (March, 1890) number of the *Glasgow Medical Journal*, as bearing on the hypothesis of contagion, supposed to apply to his own case.

these, in particular, are probably known to every member of the Glasgow and West of Scotland Branch, the one as a physician, the other as a surgeon of distinction. The latter informed me that the most surprising point to him, as regards his own case, was the extremely rapid recovery, after a degree of prostration very unusual with him in catarrh; which, he says, he has suffered many times before, but that "a really bad cold usually lasts him three weeks," whereas the present one, worse while it lasted, was over in less than three days. Of course, there were in this case no complications, and the subject of it is in robust health and in the prime of life. In the case of the physician, it is perhaps sufficient to indicate that the symptoms were of the kind usually described, and that he himself now admits freely that they carry the implication of a peculiar, and not an ordinary, catarrh.* Another gentleman, after visiting "six unmistakeable cases of influenza during the first two weeks of January," was himself attacked upon the 12th, in the form of extreme nausea, coming on first at night, and aggravated in the morning on his rising to keep an appointment by train. This he found it impossible to do, but after a few hours more was able to go through with a long day's work. On the evening of this day (13th) all the typical symptoms developed in the usual way, and were met at once by successive doses of antipyrin and quinine until the 16th, *up to which time there had been no catarrh*, unless a peculiar feeling in the right nostril. This, however, was the premonition of a pretty severe attack, ending in bronchitis, with severe neuralgic pains in the face, extreme weakness, profuse perspiration at night, and distressing nausea.

(This gentleman has since quite recovered, and he declares that his own case was exactly the counterpart of those he had previously visited).

2. In another instance, a practitioner of experience in general practice, but who has relations also with a special department in one of our great establishments, had "seen in all some ten cases of influenza, from the 5th January onwards," when he himself was attacked on the 11th, and

* The following is a *verbatim* account of the facts, as furnished by this gentleman in a brief note received since this Address was in type:—"An ordinary 'cold in the head' or catarrh from 31st December till 6th January; slight cough before it left. *Supposed* I was well, and went to a consultation to see a child on the south side at 4 A.M. on 8th January. Took ill in the evening with headache and shivering feelings; went to bed 8 P.M. Ill for about a week (temp. 102° at highest) *without the least catarrh*. Weak for another ten days after going out."

had to take to bed at once. The symptoms were the typical ones, and the temperature rose to 103° for about thirty hours, then gradually falling. Even after the fever abated there was violent backache for several days, interfering with sleep, from the difficulty of finding a position to ease the pain. He adds, "I had no catarrh till after I went out on the 15th; since then I have had a nasal catarrh and a slight cough. The subsequent weakness has been marked, and particularly depressing. Loss of appetite has been a marked symptom."

3. One more of these personal narratives may be interesting, as it is the case of a gentleman in very good West End family practice. For about a month before his own attack (which occurred on 16th January), he had been seeing or hearing about cases of influenza in his own field of practice, to the number of 15 to 20, "some of them trifling and far from typical, while others were severe and undoubted cases of the disease." This gentleman's attack was in every respect typical in its suddenness of invasion, &c., and was accompanied by nasal catarrh on the second or third day, and thereafter by cough ending, as regards all the positive symptoms of illness, about the seventh day of the attack. He adds, "I feel sure that whatever caused the illness in myself, it did not arise from cold. I did my work throughout the attack, but was compelled to snatch every five or ten minutes I could get to lie down in bed; whilst beyond one hot bath, which did no appreciable good, I did nothing in the way of treatment. My appetite was hardly at all impaired. My back remained so sore throughout the attack that I could with great difficulty flex my head. Even now (22nd January, and sixth day of the attack), flexion causes some pain."

In the remaining brief extracts I shall make from several of the letters before me, I do not propose to keep any very methodical order, but only to take a few as samples of the whole, or as containing details of special importance or interest as illustrating the subject. And to facilitate reference to the original letters, I shall number the paragraphs in sequence to those just quoted.

4. (*South Side Practice*).—"My brother and I have seen, between us, probably a score of cases of illness, which we are inclined to consider epidemic influenza. They were characterised by a somewhat sudden onset, intense headache, some backache, and a general feeling of soreness. Temperature always considerably elevated, sometimes high. Catarrhal

symptoms not universal—present in some, in a few severe. Defervescence rapid. Convalescence often rapid, sometimes prolonged. Epidemic made its appearance about three weeks ago, now (21st January) practically gone. Coincidentally an unusually large fatality from pneumonia.”

5. (*South Side*).—About 30 cases, dating from 16th December, 14 of these being in three families. Temperature in one case, 105° on first visit; in all the others, 101° to 103.4° , continuing for three or four, or in one case, five days. (Symptoms described exactly as usual.) One patient, æt. 63, died on the 16th day from pneumonia of right lung, pleurisy of left, followed by diarrhœa. “The period of incubation was difficult to determine; in two cases I was able to say that it was not more than three days.”

6. (*South Side*).—General indication of symptoms very like the preceding. Recognises two classes of cases. In one, the onset very sudden, marked by shivering, and in a few hours high fever (temp. 102.5°), eyes and fauces red and tender, tongue whitish and dry, considerable sore throat. Convalescence within four days. In the other class, premonitory listlessness and languor for two or three days, then shivering, with violent neuralgic headache, intolerance of light, &c.; pulse 130; temp. 104° ; skin hot and dry, difficulty of swallowing, and sore throat. In this class of cases there had sometimes been attacks of sneezing for a week before the attack. Perspiration generally set in on the second day of the illness, and on the fourth or fifth the temperature fell.

7. (*Townhead, Northern and Eastern*).—About 14 cases, excluding doubtful ones. The first occurred on 23rd December, in Dennistoun, and was typical. [This correspondent, it may be remarked, was regularly reading a French medical journal, with weekly accounts of the Parisian epidemic.] Temp. 105° ; in other cases, 101° to 103° . “Catarrhs were not marked. Some had slight sneezing and cough. Bronchial catarrh was present in two only. One or two had pains in the abdomen. One had diarrhœa, and a few pharyngitis. No fatalities and no grave complications.” “I consider that we have the epidemic here, but in a much milder form, and not nearly so general as on the Continent.”

8. (*West End*).—First cases seen on 25th December; since then, 29 cases. “The chief features have been remarkably sudden onset, temperatures between 101° and 104° F., head-

ache, pains in back and limbs; symptoms of nasal or gastric catarrh being insignificant. In one case, an old lady approaching 80, the attack began with such suddenness that her relatives thought she was suffering from a paralytic stroke. In the case of a man, florid, healthy, stout, it began with a faint. The subsequent features have been a fall in temperature, in some cases even to 97.4° , with great muscular relaxation and mental depression of an unusually pronounced character. This depression, mental no less than physical, I have seen as pronounced in a boy of 5 years as in the woman of approaching 80; and a young fellow of 25 told me he now no longer wondered at people being tempted to suicide. It seems to me complications have been more frequent than usual, and the chief have been respiratory, chiefly catarrh of the air passages; but the exact nature of the complication has depended on the individual attacked rather than on the nature of the disease itself. Three patients whom a full year ago I had attended for localised pleurisy, without effusion, were threatened with a recurrence; and two, who had peritonitis at a similar interval of time, developed suspicious symptoms over the site of the old attack. In none of the cases I have seen have I observed anything suggestive of specificity."

9. (*West End*).—"During the last fortnight I have seen an unusually large number of cases presenting the following features:—Shivering, followed by fever, varying in temperature from 101° to 103° and 104° , which lasts for twenty-four hours; then perspiration, with temperature at 100° or 99° for twenty-four hours; and then on the third day the temperature is normal. In some cases the above is very mild—*i. e.*, the temperature may not reach 101° ; but along with each case severe pain in the back and limbs, with headache, amounting to intensity in some cases. Sometimes a good deal of catarrh of the chest is observed, which in four cases has gone on to consolidation. In other cases sickness has been a prominent symptom, with diarrhoea. In all the cases a marked feature has been the sudden onset of the attack, and the very marked weakness which follows the subsidence of it. This weakness lasts for a few days, and if the patient is careful to avoid cold, no serious results have followed. In two cases pneumonia has followed the non-attendance to the precaution of taking care to keep indoors for four days after the attack subsided."

10. (*West End*).—This gentleman has no doubt that the epidemic is rife in Glasgow, with symptoms of which some

indication is afforded in the following remarks:—"A distinct peculiarity which I have noticed in connection with the epidemic is, that when several members of one household have suffered, their symptoms have been almost identical; but when the forms of attack in several households are compared, there are great differences; acute frontal headache in one; in another, pains in the back and limbs; in a third, sore throat. It was evident that it was the house, and not the family relationship that had to do with the peculiarity. In one institution to which I act as medical attendant I saw six of the inmates in one day, and though they did not know of each other's illnesses, the story told in each case was almost identical. The same was noticed in a warehouse in town, where fifteen out of forty of the employees were attacked within a week or ten days."

11. This correspondent, in a widespread and miscellaneous practice, has seen about 80 cases since the beginning of January. His description of the symptoms is so like most of the preceding as not to require repetition. There were no deaths, but in two or three cases severe bronchitis or broncho-pneumonia; in one woman great orthopnea not accounted for by the physical signs. Sleeplessness was a marked symptom. "The bulk of my cases were well in seven to ten days, but I have had several where the illness has lasted about 21 days, and the patients are just able to be out of bed; indeed, in two or three cases they have not yet been able, without the sense of shivering coming on, and compelling them to stay where they are."

The letter just quoted adverts to the recent occurrence, both in Glasgow and Edinburgh, of a "very severe and widespread epidemic of influenza or 'pink eye' in horses; for nearly a month or more prior to the outbreak of the disease in man, whole stables, holding large studs, have been down with it, as, for instance, was the case with our largest railway carriers and the Tramway Company." [This fact had not escaped the notice of Dr. Russell, the Medical Officer of Health, who had also occasion to note one or two facts of suspicion as bearing on the question of contagious propagation from animals to man. But, on inquiry, I find that in the large establishment of Messrs. Wylie & Lochhead, while there has been abundance of "pink eye," the men who have had to do with their very extensive stables have been almost exempt from disease, and certainly in no degree specially prone to the epidemic.]

12. In addition to the above, I have been favoured with about twenty-five communications, referring chiefly or entirely to private practice, in some of which the facts described are so precisely similar to those above cited, as to make it unnecessary to reproduce them here in detail. In others, the writers declare that they have seen no "Russian" influenza; but in several cases this statement is qualified by another—viz., that the writers have had their hands full of cases of catarrh due to atmospheric causes or to exposure, in a degree unusual, or, as some say, unexampled, in their previous experience. This may be taken as the most marked contrast with what appears above as the experience of others—viz., febrile symptoms of sudden invasion, either apart from catarrh, or with catarrh as a secondary and often insignificant concomitant. In almost every instance, however, where the range of temperature observed is particularly noted, it is curious how the same limits occur—viz., 100° to 104° or 105° , according to the severity of the attack.

13. In some of the public institutions, so far as the facts have become known to me, the disease has been either not at all or only casually observed. Neither in the Royal nor in the Western Infirmary has it assumed any considerable proportions, and in the workhouse hospitals a similar immunity has apparently existed. In the Deaf and Dumb Institution at Langside no cases have been observed. In the Royal Hospital for Sick Children no cases have become definitely known as influenza at the dispensary, nor has any case been recognised among the in-patients, although *one nurse* has been off duty from 11th January to 15th owing to a severe attack of ordinary influenza (temperature, 102.8°). In the city police force (numbering about 1,000 men) Dr. M'Gill reports that during five or six weeks the sick list has gradually risen from 3 per cent (about its normal rate) to nearly 8 per cent about ten days ago (date of letter, 21st January), when it attained its maximum. "My cases have varied very much, from ordinary catarrhal symptoms to influenza with intense frontal headache, pains of back and limbs, loss of appetite, foul tongue, ushered in by shivering, and confining the patient for ten days or a fortnight." (Mean period off duty in nine successive cases of the latter kind reported as fit to resume duty, 9 days; extremes, 5 to 15 days.) "I think, on looking over my book," adds Dr. M'Gill, "that I can safely say that I have had, during the month of January, about 50 cases. I have had, besides, a large accession of ordinary colds of two or

three days' duration, and bronchitis, pneumonia, and pleuritis." Among the 1,200 or 1,400 officers of the Post Office there have been many cases of "cold" or "influenza" of the ordinary type; but the medical men who were in attendance have not reported any definite epidemic of the "Russian" kind. In only two cases has there been congestion of the lungs. "Whatever it was, I think (adds Sir George Macleod) it is now (23rd January) gone. I find to-day no case of even bad cold reported at the Post Office, and we have just about the average number off duty." At Belvidere Fever Hospital "a father, son, and daughter were sent in as cases of 'continued fever.' After observation they were judged to be influenza, and removed to the ward prepared for the reception of cases of that disease. Son and daughter had 'taches bleuâtres.'" The only other case sent from the outside into this hospital giving rise to a suspicion, either of influenza or of enteric fever, was an old woman of intemperate habits, and in every way an "unsatisfactory" case. Dr. Allan, who reports as above on the 22nd January, notices also two cases among the attendants which he regards as influenza; one of these being a van-driver and the other a coalman, both of whom (especially the former) had been in contact with a horse suffering from "pink-eye." These five or six cases constituted the whole experience of the epidemic at Belvidere up to 22nd January.

14. In the barracks at Maryhill, with an average strength of 24 officers, 800 non-commissioned officers and men, 81 women, and 159 children, Dr. Leckie reports 13 cases, all attacked between the 14th and the 21st January. The description given leaves no doubt, I think, that these cases were exactly in accordance with the facts as recorded above, fairly typical cases in all respects of epidemic influenza. In addition, Dr. Leckie considers that he himself, his wife, one of his children, and a servant, were more slightly affected, the illness terminating in each case in about 24 hours.

15. In the Prison, Duke Street, Dr. Sutherland reports 15 cases of influenza as having occurred in the thirty-one days preceding the 20th January 1890, besides 22 of coryza, which may or may not have partaken of the epidemic influence. Of these 15 cases, 12 were well marked "with the usual symptoms, lasting two or three days, and confining the patients to bed. (Temperature, 101° to 103.5° .)" These 15 occurred among a population in all of 1,280, but were unequally divided between the prisoners and their attendants. "During

the period of 31 days, 1,140 adults (460 males and 680 females) passed through my hands in prison and resided there, on an average, ten days. Among these, 5 cases of ordinary influenza occurred (3 males and 2 females). On the other hand, among the staff of 53 adults (28 males and 25 females), and their families numbering 87 more—in all, 140, 10 cases occurred, 7 adults and 3 children." In some observations appended to the above, Dr. Sutherland indicates the excess of disease of the characters just indicated above the average as about 25 per cent; and he adds that if all Glasgow, with its 750,000 of population, had been affected in a like degree, it would mean the existence of 9,000 cases. But while quite satisfied of this excess of influenza, constituting an epidemic, he hesitates in calling this condition "Russian," until he knows exactly what are the symptoms that differentiate this trans-Ural from ordinary influenza. "From some sources I learn that there is really no difference, save in exacerbation of the same symptoms."

16. Dr. Scott, of Tollcross, who, like Dr. Sutherland, experiences a difficulty in differentiating home grown from foreign influenza, records an epidemic in the Boys' Reformatory at West Thorn, extending from the 20th December 1889, to the end of the month. "In this institution there are upwards of 200 inmates, and the numbers under the disease were on—

December 20, . . . 2	December 24, . . . 52
" 21, . . . 20	" 25, . . . 22
" 22, . . . 76	" 26, . . . 9
" 23, . . . 96	" 27, . . . 4

The temperatures ranged from 101° to 104·5°, and the boys complained chiefly of frontal headache and severe pains throughout the body. In very many cases the conjunctivæ were injected, and in some, delirium was observed. Signs of resolution were noted towards the third, fourth, or fifth day, when the liver and kidneys began to act freely. All made a good recovery except two, of whom one suffered from pulmonary congestion, and the other from acute peritonitis."

17. In the Royal Asylum for the Insane at Gartnavel, Dr. Yellowlees has recognised about thirty cases of varying severity during the month of January, all of which have ended in recovery; the attack usually passing off in three or four days, leaving as many days of weakness, and of susceptibility to other illness. Of the thirty cases, *only three occurred among the insane*, who are, as a rule, little susceptible to epidemic influences. "Our experience does not

confirm the idea that influenza spreads from person to person, but contradicts it."

The symptoms were as follows:—"Sudden onset—malaise and oppression with headache, and usually with chills. Fever follows, rising in some cases as high as 104° , and usually subsiding within thirty-six or forty hours. With the fever, intense frontal headache, and great pain in the eyeballs, especially on moving them. Very great muscular pains in the back and limbs. Utter loathing of food, and often a sense of sickness, without vomiting. Above all, extreme prostration both of body and mind, out of all proportion to the duration of the illness, and lasting for some days after apparent recovery. In a few cases, retching, griping pains, and diarrhoea occurred. In a few, great pain in the joints. In one or two, some bronchitis; in one, tonsillitis. Coryza, and the other signs of an ordinary cold, were markedly absent. The illness we have seen here is a specific and separate thing."

18. In the extracts given above, I have for the most part refrained from inserting the remarks incidentally made by several of my correspondents on treatment, chiefly because it is so abundantly evident that no sufficient basis of evidence exists for indicating a matured opinion on this point; and, indeed, no very novel therapeutic doctrine or practice can be said to emanate from the whole series, the observers being content to reproduce suggestions and methods which have been more fully discussed elsewhere. Antipyrin and sometimes quinine, severally or in combination; in a few hands salicine, in others saline remedies are considered to have afforded more or less relief. Nothing is said as to any of these substances being administered as prophylactics, in advance of the actual seizure. No measures of active depletion are recommended. Rest in bed, liquid diet of the ordinary kind, and simple counter-irritants or warm applications to the surface, are generally considered desirable or essential. Little is said as to the use of alcoholic stimulants, at all events in large doses. The mortality from the disease has been altogether owing to complications, which in the opinion of some may be mostly avoided by care in the primary attack.

I have now only to thank the numerous friends who have aided me in this enquiry; and to express a hope that, however imperfect in detail, the sketch now given of what, I trust, is now an extinct visitation in this city of a far more widely-spread epidemic, may have a certain interest for the historians of the influenza of 1889-90.

APPENDIX I.

DR. RUSSELL'S ABSTRACT OF RETURNS (GLASGOW), GIVING FOR TWELVE SUCCESSIVE CORRESPONDING WEEKS, IN THE WINTERS RESPECTIVELY OF 1889-90, 1888-89, AND 1886-87, THE FOLLOWING DATA, VIZ.:—(1) DEATHS FROM ALL CAUSES; (2) FROM THE ACUTE INFECTIOUS DISEASES; (3) FROM BRONCHITIS, PNEUMONIA, AND PLEURISY; (4) MEAN TEMPERATURES IN EACH WEEK OF EACH OF THE THREE SEASONS. (*See Description above, with Diagram, p. 5.*)

MILD—ABNORMAL. 1889-90.					MILD—NORMAL. 1888-89.					COLD—NORMAL. 1886-87.				
DATE.	Deaths (all Causes).	Infectious Dis- eases.	Bronchitis. Pneumonia. Pleurisy.	Mean Temp.	DATE.	Deaths (all Causes).	Infectious Dis- eases.	Bronchitis. Pneumonia. Pleurisy.	Mean Temp.	DATE.	Deaths (all Causes).	Infectious Dis- eases.	Bronchitis. Pneumonia. Pleurisy.	Mean Temp.
Nov. 9	245	20	67	° F. 47	Nov. 10	226	26	40	° F. 43	Nov. 6	241	33	66	° F. 46·4
" 16	232	23	75	47	" 17	185	20	43	47·7	" 13	234	37	63	42·5
" 23	243	19	69	45·7	" 24	175	19	29	46·1	" 20	238	37	69	45
Nov. 30	229	19	59	38	Dec. 1	200	19	40	40	Nov. 27	254	32	57	44·5
Dec. 7	256	19	83	38·3	" 8	211	26	43	50·6	Dec. 4	274	47	67	36·8
" 14	270	34	73	40·8	" 15	211	15	45	38·4	" 11	269	29	77	40
" 21	304	33	89	43·4	" 22	229	24	46	43·7	" 18	270	48	84	32·2
" 28	296	32	98	40·9	" 29	249	31	52	39	" 25	323	33	101	31·4
Jan. 4	312	26	96	40	" 5	288	30	75	36·6	Jan. 1	330	42	89	34·3
" 11	330	33	94	45·8	Jan. 12	294	35	70	37·8	" 8	353	52	104	32·6
" 18	277	31	74	46·9	" 19	271	34	82	41·9	" 15	311	43	99	32·9
" 25	260	34	56	38·4	" 26	255	40	65	41·9	" 22	279	39	79	40·2
...	...	...	...	...	"	...	...	...	...	" 29	299	51	79	47·3
Means,	282	29	80	41·4	...	245	28	57	41·1	...	296	41·6	83·6	37·2

From the Registrar-General's Weekly Returns.

The Means are calculated for the columns underneath the heavy cross-bar only, being those used for the diagrams at p. 165.—J. B. R

APPENDIX II. (*See p. 7.*)

RETURN BY PROFESSOR GRANT, LL.D., FROM DATA COLLECTED AT GLASGOW OBSERVATORY, SHOWING (1) THE MEAN TEMPERATURE; (2) THE RAINFALL; (3) THE HUMIDITY, AS CALCULATED FOR THE MONTHS OF OCTOBER, NOVEMBER, AND DECEMBER 1889, AND TWENTY-ONE DAYS OF JANUARY 1890, COMPARED WITH CORRESPONDING PERIODS OF TWENTY-TWO SUCCESSIVE SEASONS, 1868-89.

MEAN TEMPERATURE.

	1868-89.	1889.	Excess above Average.
October,	46°·9	46°·0	- 0°·9
November,	41°·3	44°·4	+ 3°·1
December,	38°·3	40°·3	+ 2°·0
	1868-90.	1890.	
January, 1st to 21st, or 21 days, .	40°·4	43°·0	+ 2°·6

RAINFALL.

	1868-89.	1889.	Excess above Average.
	Inches.	Inches.	Inches.
October,	3·725	3·325	- 0·400
November,	3·661	2·430	- 1·231
December,	3·645	2·988	- 0·657
	1868-90.	1890.	
January, 1st to 21st, or 21 days, .	2·835	4·586	+ 1·751

HUMIDITY (SAT. = 100).

	1868-89.	1889.	Excess above Average.
October,	85·3	85·3	0·0
November,	89·4	86·4	- 3·0
December,	91·6	87·5	- 4·1
	1868-90.	1890.	
January, 1st to 21st, or 21 days, .	74·4	84·0	+ 9·6

