of the other English towns. At Leicester, however, it shoots up to twenty-two, and twenty-four on the second and third weeks of August. As regards the whole year, the lowest averages of infant mortality are—Portsmouth, 4·9; London, 5·7; and Bristol, 5·9: and the highest, Leeds, 8·4; Liverpool, 9·1; and Leicester, 9·4. The season of minimum infant mortality is everywhere during the spring months in the sixteen large towns of England. The smallest spring mortality occurs at Portsmouth, the smallest summer mortality at Bristol, the largest summer mortality at Leicester, and the largest mortality during the other nine months of the year at Liverpool.

Fig. 2 shows the distribution of the mortality from diarrhœa through the weeks of the year, in six large towns, the curves being constructed similarly to, and on the same scale as, those of Fig. 1.

The differences in the rates of mortality from diarrhœa indicated by these curves, which are strictly comparable *inter se*, are very great, and a comparison of the two extremes, Leicester and Edinburgh, is startling; the figures showing that for every one who dies from diarrhœa in Edinburgh during the summer months, eight die in Leicester from the same disease in proportion to the population.

From the beginning of November to the summer solstice, the mortality from diarrhœa is everywhere small, being double, however, in Liverpool and Manchester as compared with London and Portsmouth. It will be observed from Fig. 2 that the curves begin to open out and diverge from each other in the end of June. The curve for Edinburgh on no week reaches the annual rate of 2 per 1,000 of the population. The highest for any week are—Bristol, 3·6; Portsmouth, 3·9; London, 5·5; Liverpool, 10·5; and Leicester, 15·8, these two last places again standing higher than any other of the towns.

The following is a list of all the large towns of Great Britain, arranged in the order of the greater or less prevalence of fatal cases of diarrhœa, during July, August, and September, the figures being the average weekly death-rate for the thirteen weeks, calculated on the annual mortality per 1,000 of the population:—*In England:* Leicester, 9·56; Salford, 7·15; Leeds, 7·02; Manchester, 7·00; Liverpool, 6·28; Sheffield, 6·20; Birmingham, 5·78; Hull, 5·56; Nottingham, 5·36; Norwich, 5·02; Newcastle, 4·61; Bradford, 4·42; Wolverhampton, 4·03; Sunderland, 3·89; London, 3·45; Portsmouth, 2·94; and Bristol, 2·38; and *in Scotland:* Dundee, 2·14; Glasgow, 1·90; Greenock, 1·75; Paisley, 1·71; Leith, 1·45; Edinburgh, 1·23; Perth, 1·08; and Aberdeen, 0·96.

From these results it will be seen that the influence of climate is unmistakable. The summer temperature of the Scottish large towns is several degrees lower than that of the English towns, and we see that every one of the Scottish towns has a mortality from diarrhœa lower than the lowest mortality of any one of the English towns. Of all the large towns of Great Britain the lowest death-rate from diarrhœa is that of Aberdeen, which is at the same time characterised by the lowest summer temperature. Further, the diarrhœa mortality of each town is found from year to year to rise proportionally with the increase of temperature, *but the rate of increase differs very greatly in different towns.* This points to other causes than mere weather, or the relative temperature and humidity of the place, as determining the absolute mortality. Thus the summer temperature of Dundee and Perth is nearly the same, and that of Glasgow and Edinburgh is also nearly alike, the excess being rather in favour of Perth and Edinburgh; and yet the diarrhœa mortality of these two towns is respectively less than that of Dundee and Glasgow. It may therefore be assumed that there is something in the topographical, social, or sanitary conditions of Dundee and Glasgow, which intensifies the evil effects of hot weather on the health of the people, so as to swell, for instance, the death-rate from diarrhœa at Dundee to double that of Perth. At Leicester the summer temperature does not exceed that of Bristol; but while the summer death-rate from diarrhœa at Bristol is 2·38, at Leicester it is 9·56; in other words, it may be assumed that there are local peculiarities affecting the population of Leicester, the effect of which is to quadruple the death-rate from diarrhœa in that town as compared with Bristol. It is to these local conditions we must look for an explanation of the great differences in the death-rate of the different towns. The highest average death-rate per annum for the period under discussion is Liverpool 30·6, Glasgow 30·5, Manchester 30·2, Greenock 39·3, and Paisley 29·0; and the lowest is Portsmouth 20·6, London 23·0, and Aberdeen 23·3. Thus, for every two who die at Portsmouth, three die at Liverpool, Glasgow, and Manchester.

These facts suggest large inquiries which call for instant and serious attention. As one of the first steps of the inquiry, it is most desirable to know exactly from a weekly registration of the facts, whether the infant mortality is equally distributed among all infants, however nursed, or whether it may not rather be distributed among them in very unequal proportion, according to the manner in which they are fed. Those, for instance nursed at the breast may be much less liable to succumb to diarrhœa in summer than those fed on cow's milk or those fed on slops. The unusually low temperature of December last very largely increased the death-rate everywhere in the British Islands, particularly from diseases of the respiratory organs and from many diseases connected with the nervous system and the skin. The gross number of deaths registered in the different large towns showed that the excess of deaths thereby caused was very unequally distributed over the country. If there had been a more complete system of registration, for all the large towns, it might have been possible, reasoning from the specific diseases which proved to be unusually fatal at each place, to lay the finger on those local conditions, inimical to health, to which the high rate of mortality in each case was due. During the cold months of the year—December, January, and February—the mortality among females is very considerably in excess of that among males in London; for while during these thirteen weeks the average death-rate among males rises 7·8 per cent. above the weekly average of the year, the death-rate among females rises to 11·2 per cent. above the average. Since the facts of mortality for sex are only registered for all causes and all ages, it is impossible to say from the present system of registration how much of the excess of mortality among females in winter is due to sex, and how much to occupation, or even to fashion.

A comparison of the meteorological with the mortality records shows in an impressive manner the influence of particular types of weather in largely increasing or diminishing the number of deaths from particular complaints. Thus, periods of unusual cold combined with dampness in the end of autumn, cold with drought in spring, cold in winter, or heat in summer, are accompanied with a proportionally increased mortality from scarlet fever, whooping-cough (if these diseases be epidemic at the time), bronchial affections, and bowel complaints respectively. Again, as regards diarrhœa, for example, there appear to be certain critical temperatures, such as 55°, 60°, 63°, and 65°, at which as they are reached, the mortality rises successively to greatly accelerated rates. To work out the problem of the relation of the weather and mortality of our large towns, it is indispensable for the comparison of the different towns with each other, that the system of observation be uniform at all places, particularly as regards the hours and modes of observing the temperature, humidity, and movements of the air, and the rainfall; and it is further indispensable that several meteorological stations be established in each of the large towns.

ALEXANDER BUCHAN

SCIENTIFIC SERIALS

Mental Science Journals, January, April, July.—The January number opens with an article by Samuel Wilks, M.D., "The Study of the Human Mind from a Physiological View." Dr. Wilks finds no more difficulty as regards the relation of the mind and brain than in "the association of other functions with their respective organs." The main purpose of the writer seems to be to show that men are very much of automata. In this he thinks he has followed Dr. Huxley, who however, if he meant anything, meant that men are altogether automata. The illustrations of the automatism of doctors must be alarming to the nervous and ailing. Example: "Up to the present time I have never seen a single case of leucocythæmia of the lympathic glands, or the spleen, or simple idiopathic anæmia, without the patient's having been saturated by iodine, quinine, and iron; but no case is yet recorded of these remedies having done the slightest good."—David Nicholson, M.B., continues his "Morbid Psychology of Criminals," and shows his vigorous common sense in refusing to see that suicide is always an insane act, or that there is any "madness in an idle-minded fellow preferring to live 'like a gentleman' by helping himself directly from moneyed pockets, instead of sweating his life out with a pick

and shovel at fourteen shillings a week."—This number contains an interesting paper on the Hallucinations of Mahomet and others, by W. W. Ireland, M.D.—In the April number we find the Morisonian lectures on Insanity for 1873, this time written entirely by Dr. Clouston; the Morbid Psychology of Criminals continues; an article on the Family Care of the Insane in Scotland, by Prof. Friedrich Jolly, of Strasburg, is valuable, inasmuch as it helps us "to see ourselves as others see us," and pleasing, as this time we may look and be not ashamed. "This visit," says Prof. Jolly, "and the information furnished by these gentlemen, as well as a more careful study of the Scottish Reports and their appendices, convinced me that it is no 'Gheel in the North' with which we have to do, but an organisation which rests on a quite different and much sounder basis."—George Shearer, M.D., communicates notes to show that "Diseases of the general nervous system are by no means infrequent amongst the Chinese, but cases of alienation of mind are comparatively few."—Mr. E. Thompson continues and concludes his paper on the Physiology of General Paralysis of the Insane and of Epilepsy. The worst things in the paper are a few unseemly remarks directed against Dr. Hughlings Jackson.—The July number opens with a Chapter on some Organic Laws of Personal and Ancestral Memory, by J. Laycock, M.D.—The Morisonian lectures on Insanity are continued from the previous number.—David Nicholson M.B., furnishes his excellent articles on the Morbid Psychology of Criminals, which we have always read with much pleasure.—S. Messenger, F.R.C.S., writes under the title, "Moral Responsibility," to show that we all are what we are because, given our parents and our circumstances, we could not have been otherwise. The moral of "this theory of no-moral of responsibility" is very good, "we should be more generally charitable in our judgments, more universal in our forbearance." It is a pity that the men who are continually claiming to be the only scientific men cannot reach such simple conclusions without outraging language and common sense in order to show, by the way, that they are not metaphysicians. Mr. Messenger describes the manufacture of thought as similar to the manufacture of gastric juice—the action of the brain is like "that of the stomach, whose peptic glands secrete the gastric juice from the circulating blood, but need the stimulus of food to excite the process." It would be a great advantage to the scientific men of this stamp if they would try "the means of observation which metaphysicians employ," or any other that might help them to see that intelligence is not a juice.

IN the *Scottish Naturalist* for April and July 1875, the difficult subject of the relationship between the mental development of man and of the lower animals occupies a rather prominent place, in a series of articles by Dr. Lauder Lindsay, on "Illustrations of Animal Reason," and one by the Rev. J. Wardrop, on "Animal Psychosis."—The former writer also contributes a paper on "The Auriferous Quartzites of Scotland," in which he brings forward evidence in support of the view long since published by him of the auriferous character of the whole Lower Silurian area of Scotland; the rocks being identical stratigraphically with those of the gold-fields of the province of Otago, in New Zealand.—There are several other good geological papers, especially one by Mr. R. Walker, "On Clays containing *Ophiolepis gracilis*, &c., near St. Andrew's."—The zoological and botanical papers are mostly descriptive, and we have continuations of the "Lepidoptera of Scotland," by Dr. Buchanan White, and the "Coleoptera of Scotland," by Dr. D. Sharp.

THE numbers of the *Journal of Botany* from March to July contain many articles of interest; and nearly every number is now illustrated by at least one original drawing. Those in the numbers now under notice are the fruit of the Bitter Cola, an undescribed species of Clusiaceæ from Wesetrn Tropical Africa, nearly allied to *Garcinia*, several species or new or rare Hymenomycelous Fungi (coloured), *Deidamia Thompsoniana*, a remarkable species of Passifloraceæ, and *Carex ornithopoda*, a newly discovered British species. Besides a number of abstracts and short notes, the following are the more important original articles in these numbers:—Descriptions of a number of new and unpublished species by Dr. Masters, Dr. Trimen, Mr. J. G. Baker, Dr. Hance, and others. In Cryptogamy, Mr. Worthington Smith describes a number of new species of fungi; the Rev. J. M. Crombie the additions to the British lichen flora since his last notice; and Mr. J. G. Baker several new ferns. One of the best papers in these numbers is by Mr. A. H. Church, with an account of some recent investigations in phyto-chemistry at the laboratory at Cirencester. An analysis of the dried substance of a fungus (*Geoglossum difforme*), and of a lichen (*Collema furvum*), showed the former to contain 19 and the latter as much as 28 per cent. of albuminoids; while the former contains the very large proportion of 13·87, and the latter 6·57 per cent. of ash. Cotton, generally considered to be almost pure cellulose, was analysed with the following result:—

Water	7·56 per cent.
Oil and fat	0·51 ,,
Albuminoids	0·50 ,,
Gummy matters	0·17 ,,
Ash	0·11 ,,
Cellulose	91·15 ,,
	100·00

The composition of the pollen of *Cupressus fragrans* was determined as under:—

Carbohydrates and undetermined	85·76 per cent.
Oil and fat	1·87 ,,
Albuminoids	8·67 ,,
Ash	3·70 ,,
	100·00

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, June 15.—This number contains a paper by Herr Hellmann, of Berlin, on the extension of a short series of observations on temperature by means of the long series of a neighbouring station. It was one of Dove's result's that series of mean temperatures of two neighbouring places derived from a different number of years might be reduced so as to extend over equal periods. His hypothesis has proved a fruitful one. The object of Herr Hellmann was to confirm its value, and this he did by taking mean temperatures already obtained by observation for long and equal periods at two neighbouring places; then assuming that, say for the last five years, no observations had been made at one of them, and calculating from those of the other the required means for the whole period. The difference between the real values and those calculated expresses about the amount of error incurred, which is surprisingly small. Thus, out of eighty-four monthly means for seven pairs of similarly situated stations, only four differences exceeded one-tenth of a degree. But when a hill station is compared with a valley station the agreement is not so good, and it appears that with increase of height the climate becomes more uniform; between an inland and a coast station the difference is still greater, but rarely exceeds half a degree. We may conclude that observations made at a place situated on a plain may safely be employed for the extension of a shorter series of observations made at another place at no great distance, similarly situated, and that the error will be greater when stations different in position are compared.

July 1.—This number contains a review of Mr. Symons's publications on British Rainfall, by M. Raulin, of Bordeaux, and, among the "Kleinere Mittheilungen," a paper on the production of centres of cold in winter.

SOCIETIES AND ACADEMIES

LONDON

Royal Horticultural Society, July 7.—General Meeting.—Hon. and Rev. J. T. Boscawen in the chair.—The Rev. M. J. Berkeley briefly alluded to Mr. Worthington Smith's paper before the Scientific Committee.

July 21.—Scientific Committee.—M. T. Masters, M.D., F.R.S., in the chair.—Mr. Bennett exhibited a fine specimen of a fasciated cucumber stem bearing two cucumbers.—Mr. W. G. Smith made a further communication on the resting spores of the potato fungus.—A letter was read from Mr. C. E. Broome, including a sketch of *Diplodia*-like bodies met with in the mycelial filaments.—Mr. Renny made a communication on the same subject, and exhibited a species of *Pythium* (*Saprolegnieæ*), which, without care, might be mistaken for the state of *Peronospora* described by Mr. Smith.—A letter was read from Lady Mathison, accompanying specimens of various larvæ which proved very destructive to the otherwise thriving plantation of Falkland Island Tussock grass (*Dactylis cæspitosa*) in the island of Lewis.—Mr. Alfred Bennett called attention to the rapid growth of the flower-stalk of *Vallisneria spiralis*, which he had observed to grow as much as 12 inches in twenty-four hours.—A letter, communicated by Dr. Hooker, P.R.S., was read from Dr. Imray, of