

nor Dr. Z. Even when averaged with Dr. X's 5 per cent., the resulting 10 per cent. is not a true average unless the three component parts were of equal magnitude. The author believes that, as the averages are so far removed from the extremes, the final results would not have been very different if the estimates of 300 physicians instead of three had been obtained. This is a pious opinion and nothing more. Where there is a wide divergence in a small series of observations, there is all the more necessity for taking a large series, if any trustworthy deduction as to the true average is to be obtained; as the old formula of Poisson shows clearly enough. The author's conclusion is that in the United States in 1908 the mortality due to alcohol, directly or indirectly, amounted to 66,000 deaths, or about 1 in every 13 deaths at adult ages, or 5.1 per cent. of the total mortality from all causes at all ages. Mr. Phelps gives useful summaries of previous investigations on the subject, but does not refer to Mr. R. M. Moore's valuable comparison between abstainers and non-abstainers in the United Kingdom Temperance and General Provident Institution in 1903. The admission that the essay is only the beginning of a systematic attempt to deal with a difficult matter makes further criticism inconvenient. We do not think that the work proves much, but we would not for worlds impede further study on what may become valuable lines. The subject is too vastly important.

#### CHEMICAL STRUCTURE AND PHARMACOLOGICAL ACTION.

ALTHOUGH the changes undergone by any substance within the animal body may differ from those which occur in a test-tube, and difficulties may thus arise in predicting its pharmacological properties, yet its effects must ultimately depend on its chemical composition; and the advance of chemical investigation is gradually leading to the elucidation of the problems of pharmaco-dynamics in relation to structural formulæ. In a recent paper which appeared in the September number of the *Bristol Medico-Chirurgical Journal* Dr. Oliver C. M. Davis shows how in certain chemical groups of bodies physiological effects are related to chemical structure and properties. For example, in the case of certain anilides or derivatives of aniline, which are slowly hydrolysed within the body with production of the amine and the acid from which they are derived, it is found that toxicity varies to a great extent with the rate of their decomposition; thus, formanilide is more toxic than is acetanilide. A second factor in the toxicity of these bodies is the molecular weight of the resulting acid, an increase in this respect leading to a diminution in pharmacological potency. A third factor of importance is found in the degree of its chemical affinity for the tissues of the body, and it is seen in the case of the toluidines, for example, that the "para" salt is active, while the "meta" salt is of little potency and the "ortho" salt is inert. Thus atoxyl—p-amino-phenyl-arsenic acid—is effective against trypanosomes, while its meta- and ortho- relatives are of little or no value (Breinl and Nierenstein). The power of certain bodies to attach themselves to the molecule of protoplasm seems in some cases to depend on the presence in them of an amino group. Atoxyl may again be taken as an instance, since if its  $\text{NH}_2$  group is replaced by OH or by  $\text{N}(\text{CH}_3)_2$  its activity as a trypanocide is lost. Finally, the activity of any substance when it has attached itself to a living cell is influenced by the rate at which it is again broken off from the cell and excreted. Dr. Davis therefore suggests as a guide to investigation a hypothetical formula in which the "toxicity constant" of any body is equal to its "physiological affinity" divided by its "excretion constant." The whole paper is interesting and stimulating,

and deserves the attention of those who are versed in the problems of pharmacological actions, while it leads us to hope that the old taunt against physicians, that they poured drugs of which they knew little into bodies of which they knew less, is in process of being rendered obsolete by extension of pharmacological as well as of physiological knowledge.

#### "SYNTHETIC MILK."

LAST week the papers announced the production of "synthetic milk," and in response to an invitation from the company connected with the exploitation of this new food product our consulting chemist was able to inspect and taste a sample of the first consignment sent to this country. Later we may have the opportunity of examining "synthetic milk" with some detail, but it may be said, without pre-judging the case, that the substance looks very like milk, and has a round, sweet, fatty flavour not unlike that of rich milk. It appears to be an ingeniously made uniform emulsion, and is said to contain a rather larger proportion of the nutritive constituents of ordinary milk, derived from the soya bean amongst other vegetable sources. There was present at the demonstration a good representation of scientific authorities, so that further details in regard to the actual dietetic qualities of "synthetic milk" will sure to be forthcoming. It is stated that the product can be retailed at 3*d.* a quart. Soya milk is referred to in certain text-books on foods, and is said to be made by boiling the beans until they are soft and then beaten to a pulp. The theory of an ingenious preparation is that a vegetable casein then passes into solution and forms an opalescent fluid which resembles milk by the fact of a skin forming on its surface when boiled, just as in the case of cow's milk; and the casein further can be precipitated from solution, it is stated, by rennet or acids. But, of course, casein is only one of the constituents of cow's milk, and "synthetic milk" is said to contain them all.

#### TYPHOID PLEURISY.

PLEURISY has long been recognised as a complication of typhoid fever, but only in recent years has it been bacteriologically investigated. A considerable number of cases in which the typhoid bacillus was found in pure culture has now been recorded, mostly by French writers. In the *Canadian Medical Association Journal* for September Dr. F. G. Finley has published an important paper on Typhoid Pleurisy based on a study of the literature and an analysis of 19 cases which occurred at the Montreal General Hospital among 2100 cases of typhoid fever under treatment from 1897 to June, 1912. Pleurisy occurring with well-marked pneumonia or found with pneumonia at the necropsy is excluded. The incidence of pleurisy varies considerably in different epidemics of typhoid fever and in different localities, but most writers agree that it is one of the rarer complications. At the Johns Hopkins Hospital Dr. J. McCrae found pleurisy present in 2 per cent. of the cases of typhoid fever. Two French writers, Lesné and Ravaut, found pleurisy with pure cultures of the typhoid bacillus in 0.66 per cent. of the cases. On the other hand, other writers give a much higher percentage, Heymann as much as 14 per cent. Pleurisy usually develops towards the middle of, or in the latter part of, the febrile process, but it may occur at the onset or after defervescence. The symptoms do not materially differ from those of ordinary pleurisy. In Dr. Finley's series of cases the pain was usually present early, and sometimes was severe. The temperature, pulse, and respiration showed a slight increase, and a moderate amount of fluid was usually found within

a couple of days. Friction was heard in most of the cases. One feature frequently noticed was the persistence of crepitant or subcrepitant râles during the period of effusion, suggesting a simultaneous pulmonary lesion. A point of practical importance was the occurrence of abdominal pain often associated with rigidity. In some cases these symptoms were so marked as to suggest perforation of the bowel. We may point out that a case of typhoid fever has recently been described in our columns,<sup>1</sup> in which the abdominal symptoms produced by pneumonia so simulated perforation that laparotomy was performed. The fluid in typhoid pleurisy may be sero-fibrinous, hæmorrhagic, or purulent. Agglutination of typhoid bacilli is usually produced by the fluid, but to a much less degree than by the blood. However, Achard has recorded a case in which the reverse held. This property of the fluid may prevent typhoid bacilli being found on culture. The leucocyte count is usually low, but in one of Dr. Finley's cases it rose to from 4000 to 7800 after the onset of the pleurisy. The course of typhoid pleurisy is generally benign, the fluid remains small in amount, and is absorbed in a period varying from two days to several weeks. Only one of the 19 cases was fatal. In this case the patient was a man, aged 27 years, who had a high temperature, delirium, rose spots, bronchitis, with muco-purulent sputum, and feeble heart action. There was no evidence of pleurisy during life, and he died from toxæmia on the thirty-fourth day. The Widal reaction was positive. At the necropsy, in addition to the usual lesions of typhoid fever, 375 cubic centimetres of bright red fluid in the left pleural cavity, broncho-pneumonia, and an infarct in the left lung were found. Cultures from the pleural fluid yielded the typhoid bacillus in pure culture. Galliard has insisted on the importance of pulmonary infarct in the production of pleurisy. Phlebitis was a frequent complication in the pleuritic cases, being present in six.

#### THE THIRD INTERNATIONAL CONGRESS FOR DISEASES OF OCCUPATION.

THE International Congress for Diseases of Occupation undoubtedly occupies a field of research for which there is a great opportunity. The industrial age has brought about so many new conditions that it is small wonder that it also brings in its train new developments in the way of disease, and the study of them is as yet only in its infancy. The third Congress will be held in Vienna in the autumn of 1914, and among those who have promised to take part are the Association of Certifying Factory Surgeons (London), Sir Arthur Whitelegge, chief inspector of factories (London), Miss Anderson, principal lady inspector of factories (London), Professor Heim (Paris), Professor Hahn (Königsberg), and Hofrat Professor S. Exner (Vienna). The sections will be seven in number—viz., 1. Fatigue: Physiology and Pathology, especially with regard to professional work, Effect of Professional Exertion on the Nervous System, and Night Work. Among those who have promised to take part in the proceedings of this section are Professor Boeri (Naples), Dr. A. Glen Park (Bolton), Dr. Rutten (Liège), and Professor Weichardt (Erlangen). 2. Work in Hot and Damp Air—M. Boulin, inspecteur divisionnel du travail (Lille), Professor Langlois (Paris), Professor F. Marboutin (Paris). 3. Anthrax—M. Cavallé, inspecteur départemental du travail (Castres), Professor Peroncito (Turin), Professor A. Schattenfroh (Vienna), Professor A. Sclavo (Siena). 4. Pneumoconioses—Professor Langlois, Sir Thomas Oliver (Newcastle-on-Tyne). 5. Injuries through Electricity—Privat-docent Dr. S. Jellinek (Vienna). 6.

Industrial Poisons, especially anilin, mercury, and lead—Sir Thomas Oliver, Privat-docent Dr. Rambousek (Prague), Dr. F. Curschmann (Bitterfeld), Dr. Alice Hamilton (Chicago). 7. Injuries of Hearing—Professor Alt (Vienna), Dr. Peyser (Berlin), and Professor Siebermann (Basle). Those particularly interested in this subject and desiring further particulars should address Privat-docent Dr. L. Teleky, 23, Türkenstrasse, Vienna IX. The notice given of the Congress is long, but commendably so, for reports made to it, if they are to be of full public value, should be founded on a range of practical work, and made authoritative by close testing.

#### SEPTEMBER AT HOME AND ABROAD.

THE weather of September, like that of August, was remarkable for its low temperature, but in every other important respect it was entirely different. Soon after the beginning of the month an anticyclonic, instead of a cyclonic, distribution of barometric pressure came over the United Kingdom from the westward and north westward, and as the centre of the high pressure system lay either directly over this country, the North Sea, or the countries immediately beyond, for about three weeks, it formed during that period an effectual barrier against the Atlantic cyclones. These latter were compelled to travel along a more northerly track, many of them passing somewhere between Iceland and Greenland. Towards the end of the month, however, the anticyclone became exhausted, and as the barometer at once rose in Iceland the cyclonic disturbances found their way over these islands, giving very general rain. In the south and south east the downpour was so heavy that more rain fell within 48 hours or so than generally occurs during the whole month. The lack of seasonable warmth was mainly due to the lack of sunshine, for in spite of the general dryness the sky was much more often cloudy than clear. In the metropolitan area there was a deficiency of about an hour per day. Three days were entirely sunless, and on seven others the record was less than an hour. In few other parts of the kingdom was the quantity of sunshine so poor, but over very extensive districts the figure varied between a half and three-quarters of an hour per day less than the normal. At Jersey there was a mean of about five hours per day, while at Kew the mean was no more than 3·7 hours per day. At Buxton and in the north Midlands generally the total number of hours for the month was less than 100, but at Harrogate it equalled 106 hours. In the south Midlands and south-west of England the supply was more liberal. At Bath the figure was 131 hours, and at Newquay 148 hours. The weather did not become generally dry until after the first few days, but subsequently until the 29th there was hardly a drop of rain, except on one or two occasions in the south-west of England, in the south and south-west of Ireland, and in a few localities in Scotland. The month cannot but be considered a very dry one, even in the southern districts of the kingdom, where the actual quantity of rain equalled or exceeded the average. In nearly all localities north of the Thames the total rainfall was considerably less than the normal, many places having a record of less than an inch. The lack of seasonable heat during the daytime was at least as unusual as the many days without rain. The difference from the temperature normal was nearly 6° over a large portion of England during the afternoons and about 3° after sunset. At Kew the shaded thermometer failed to touch the moderate figure of 60° on as many as 15 days, and on the 9th, 10th, and 11th it remained below 55°. In the north Midlands, as represented by Harrogate, there were 24 days with a maximum below 60°, while at Aberdeen there were 28 days. At Bath, where the afternoon warmth showed a