

almost feverish activity. With the blessed prospect of peace now in sight, it is hopeless to expect that we shall wholly catch up our rivals. Indeed, it will require skilful handling, both on the part of the Government and of our manufacturers, to safeguard the position we have already won.

But whatever the future may have in store, it is quite certain that applied organic chemistry in this country has received a great impetus, and that it is destined to become an increasingly important factor in our chemical industry. In certain subordinate branches, indeed, the ground gained has already been consolidated. German competition in the case of some organic products is no longer in question. Not only have we succeeded in manufacturing these substances; we are also turning them out of better quality than heretofore and rapidly securing a world-wide market for them.

In view of the prospect before us the problem of the supply of alcohol for industrial purposes acquires a fresh importance. It has been in the past a somewhat thorny question, made needlessly acute by misunderstanding and misrepresentation. It has been complicated by fiscal considerations, and by the attitude of a Treasury which was more concerned in safeguarding and securing revenue from this source than in appreciating the demands of industry. The Treasury, although ultimately responsible, may plead that it is not wholly to blame, since in this matter it is dependent upon its official advisers, who, being for the most part persons attached to revenue departments, could not be assumed to be altogether unbiased. Still, in spite of official inertia and conservatism, the revenue authorities have, of late years, become increasingly sympathetic with the needs of manufacturers, and concessions and relaxations which twenty years ago would not have been contemplated are now readily obtainable. A stumbling-block is the necessity for denaturing. Wood-naphtha costs more than ordinary spirit, hence methylated spirit is more expensive than duty-free common alcohol. In some cases the presence of methyl alcohol, or the substances associated with it in the crude commercial article, are positively detrimental. The Excise authorities have appreciated these objections by allowing manufacturers to denature the alcohol by the use of some substance which is ancillary to the manufacture of the article for which the alcohol is needed, and at the same time renders the spirit unpotable.

It can scarcely be doubted that industry will need much larger quantities of alcohol than have hitherto been available, and increased attention will need to be paid to possible sources of supply. It is not only in industrial chemistry and in many other arts that alcohol is required. It is beginning to receive consideration in this country as fuel, and particularly in internal-combustion engines. Up to the present time the use of alcohol as motor fuel with us has not been a commercial possibility; it could not be produced at a price that would compete with petrol at pre-war figures. Circum-

stances have, however, changed, and it is unlikely that any form of motor-spirit will sink, at all events for some time to come, to the prices of 1914. Nor is it probable that the raw materials which have hitherto served for the manufacture of alcohol in this country will for years reach their former low values. These substances for the most part have been cereals, or some form of starch-producing, and therefore potential sugar-producing, material. In addition, considerable quantities of spirit have been made from molasses and other saccharine substances capable of fermentation. Potatoes with us are too valuable as a food to be employed, as in Germany, for the manufacture of alcohol.

But there are other modes of obtaining alcohol than from substances which can be used for food, and it is this circumstance that has induced Mr. Long to appoint the Committee to which we made reference in *NATURE* for October 17. Large quantities of spirit are now obtained from the sulphite liquors in the manufacture of wood-pulp, and factories for the manufacture of alcohol by this process have been established in Sweden, North Germany, America, and elsewhere. To such an extent has the manufacture developed in Sweden that the Government is contemplating a monopoly of the wholesale trade in technical spirit—a measure which has aroused considerable opposition in industrial circles. We learn that a company with a minimum capital of 1,000,000 kronor has been founded in Stockholm to manufacture and sell motors and automobiles run on sulphite spirit.

The process of treating seaweed, to which Sir Edward Thorpe directed attention in a recent letter to the *Times*, is a method of saccharifying cellulose material very similar in principle to that employed in the wood-pulp industry. Factories to exploit seaweed in Sweden have been or are being erected at Varberg and in Skane, probably on lines similar to those worked in Glasgow. Considering the enormous quantities of valuable seaweeds to be met with on our coasts, especially among the Western Isles of Scotland and on the west coast of Ireland, it is to be regretted that no effective steps are taken to turn them to practical account. Although formerly of considerable commercial value, the only use that is now made of them is to a limited extent as manure on land adjacent to the shores on which they are gathered. Only an infinitesimal amount of that readily available is so used, and it seems a pity that material so intrinsically valuable should not be dealt with more efficiently.

EPIDEMIC CATARRHS AND INFLUENZA.

THE present epidemic of influenza, and the rise in the rate of mortality consequent upon it, are receiving much attention in the public Press, and many irresponsible statements are being made concerning the disease. Among these is the hint that the "so-called influenza" is plague in a thin disguise. These erroneous views may at once be discounted. There is no doubt, as Prof. Hewlett

stated in his article in last week's *NATURE*, that in the present outbreak we are concerned with the same disease which was widely pandemic in 1889-92, and prior to that had been almost unknown for forty-three years. Since 1892 influenza has lifted up its head at intervals of a few years, and since war began it has been the cause of a fairly heavy mortality in this country, as well as among other belligerent nations, and farther afield in South Africa, in India, and in various parts of America. A clear general conspectus of our present knowledge, and, it may be added, our lack of knowledge, of the disease is given in a memorandum¹ recently issued by the Medical Officer of the Local Government Board.

The chief peculiarity of the epidemic prevalence of influenza during 1918 is that it has occurred at short intervals, scarcely three months having intervened between the epidemic which culminated in July and the even more severe epidemic which now prevails throughout the United Kingdom, and is almost world-wide. It has recently been stated that the epidemic occurrence of influenza in July should have furnished warning of the present autumnal epidemic. Those who put forward this statement have not made themselves acquainted with our national experience of influenza. In actual fact no previous known epidemic of influenza in this country has had a summer maximum, and no previous epidemic has recurred within three months of a previous epidemic. In the light of events this rapid recurrence is not difficult to explain; for the exigencies of warfare, the rapid transport of many tens and hundreds of thousands of troops across the seas in circumstances which necessitated dense aggregation of persons, have intensified infection, multiplied the opportunities for severe secondary infections, and have exposed the civil population to exceptionally virulent complex infection.

The memorandum referred to above states that the bacillus of influenza (*Pfeiffer bacillus*), which commonly is present in these cases—whether causally or as an aggravating cause of pneumonia—has associated with it pneumococci and hæmolytic streptococci, which produce septic pneumonia and empyema in a considerable proportion of the total cases. The question of vaccine treatment and of prophylaxis by vaccine is considered, and there is some hope of success in this direction, though reliance must be placed chiefly on the hygienic precautions which are detailed in the official document. Of these, probably chief importance should be attached to the avoidance, so far as practicable, of overcrowded conditions; and in this connection special stress is laid on the importance of avoiding large units of aggregation, which greatly intensify the risk of infection. The importance of this consideration is too often ignored in civilian life; under military conditions such large units of aggregation cannot always be avoided.

The main object of this article, however, is to

¹ Memorandum on Epidemic Catarrhs and Influenza. By Sir A. Newsholme, K.C.B. (H.M. Stationery Office.) Price 1d.

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emphasise the need for further research on this disease. Some of the lines on which such research is called for are indicated in Sir Arthur Newsholme's memorandum. "Influenza is to be regarded as a member of a group of catarrhal infectious diseases which in the aggregate are perhaps the chief enemies of human health," and it is significant, that even in the years when the ravages of influenza are greatest bronchitis and pneumonia are each responsible for twice as many deaths as influenza. Thus the general problem is that of the prevention of catarrhs. How can immunity be secured and maintained? Will immunity against one catarrh-causing organism assist in securing immunity against others? If immunity cannot be secured against influenza, can one rob the disease of its terrors by a vaccine against purulent bronchitis or pneumonia?

These are among the problems urgently needing investigation. When the National Insurance Act was passed, one of its most valuable provisions was the 1d. per insured person which enabled the work of the Medical Research Committee to be initiated. During the war the energies of this Committee, and, it may be added, of most pathologists who could have been utilised for a national investigation on influenza, have been diverted to war-work. This work has been of great value; but it may be hoped that ere long staff and time will be available for a steady and continuous investigation of the numerous problems of immunity in relation to catarrhal infections. The public must be prepared to spend money on such investigations on a much larger scale than in the past if success is to be achieved; and for this purpose it will be necessary to train a generation of pathologists who can be certain of a fair livelihood while undertaking such work. Unless careers as pathologists are open to a much larger number of specially qualified workers than are at present available, the work of research will continue to be hampered as in the past. The harvest truly is great, but the labourers are few.

Meanwhile we must depend in the main on avoidance of crowds and on the practice of elementary personal hygiene in the prevention of influenza. The public can minimise this disease only by the active co-operation of every member. This involves a self-abnegation on the part of persons suffering from catarrh which is too often absent; they consider their work as more important than the welfare of their co-workers; and it is evident that so long as this continues influenza will at intervals continue to plague humanity.

DYESTUFFS AND THE TEXTILE INDUSTRY.

NOTHING could be more convincing of the neglect of this country to provide the means whereby the applications of scientific discovery should be made available in the conduct of important industries than the speech of Mr. Lennox B. Lee on the occasion of the annual meeting of