be pursued in these compulsory classes would have reference to preparation for the duties of life, to the right and profitable use of leisure, to instruction in the principles and practice of the occupation into which the young person had entered, and to the care and preservation of bodily health and vigour. To achieve this aim is a national duty of tremendous—of paramount—importance, and, having regard to the vast depletion of our young virile life by the operations of the fierce struggle in which we are engaged, of stern, unyielding necessity, no matter how great the cost, if the future of the nation is to be assured as one of the great civilising and freedom-inspiring forces of mankind. The task of the nation is enormous. It can only be accomplished by a spirit of stern self-sacrifice.

Readers of NATURE will not need to be reminded that the findings of this—it is to be hoped, epoch-making—report are consistent with its constant advocacy through many years of the policy of raising the school age, and of requiring regular attendance until the compulsory period of elementary-school training is completed, of due provision in the curriculum for satisfactory training in the facts and principles of science, and of continued compulsory education until eighteen years of age is reached of all young people entering employment at fourteen years of age It is also not out of place to remark that so long ago as 1914, before the advent of the war, the Education and Technical Education Committees of the British Science Guild had prepared a report embodying the main points of the report now under review, and this has since been presented to the Prime Minister's Reconstruction Committee for consideration in connection with schemes of educational reconstruction. The Departmental Committee on Juvenile Education has had the advantage of interviewing witnesses representative of many varied industries, including both employers and employed, together with persons representing the opinions of various educational bodies, and has found, speaking generally, a practical unanimity of opinion in the reforms set forth in the report; it is satisfactory also to find that the report and its recommendations are signed by all the members of the committee. It is to be hoped that the principal recommendations may quickly be given legislative effect.

SCIENTIFIC ASPECTS OF GLASSHOUSE CULTIVATION.[1]

THE valley of the River Lea is the seat of some of the most intensive cultivation in the British Isles. The traveller along the Great Eastern Railway line to Cambridge, which traverses this district, begins to see great numbers of glasshouses soon after leaving Enfield, and still more near Enfield Lock, Waltham Cross, and Cheshunt. It is estimated that in this district there are no fewer than 1000 acres occupied by glasshouses, each acre representing a capital of approximately 1000*l*. The chief crops grown are cucumbers and tomatoes, but peaches, grapes, roses, palms, and other plants are also produced. The growers, as might be expected, are extraordinarily skilful: one sends peaches to New York in the proper season at fancy prices; another has even sent palms to Africa; but the great bulk of the produce is grown for the English consumer, and is put on the market at such prices as are within the reach of all.

As might be expected, glasshouse cultivation presents special features marking it off sharply from outdoor work. The temperature and water supply, perhaps the commonest limiting factors on good farms, are under almost complete control, and can therefore be eliminated as limiting factors; but the light supply is often an important factor, while questions of manuring, the adjustment of temperature, and water supply are of enormous technical importance and great scientific interest. In addition, the special conditions lead to some remarkable soil relationships.

Some of these problems were first studied three or four years ago at the Rothamsted Experimental Station, but it soon became clear that the only proper way of dealing with them was to found an experimental station *ad hoc* and to place it in the centre of the district. This was done, the money being found partly by the growers and the county councils, and partly by the Development Commission. The second annual report of the new station is now issued.

It is pointed out in the report that the investigations at the Experimental and Research Station must not follow too closely the lines adopted at the agricultural experiment stations, but must differ from them in taking more account of the qualitative factors which might affect the fruiting, and in recognising light, temperature, and water as factors influencing the growth and habit of the plants. For convenience of investigation the plant-growth is divided into three stages: the early stage, as seedlings and in small pots; the later stages in large pots or borders; and the fruiting stage. This division is justified not only on technical, but also on scientific, grounds.

In the first stage—the seedling stage—probably the most important feature is the type of growth. Growers recognise a "hard" growth and a "soft" sappy growth, the latter being commonly considered of less value for fruit production. The conditions under which each can be got are well known to the grower, but it is very desirable that they should be better characterised than they are at present, and that the relationship between habit and conditions of growth should be studied. The habit of growth owes its importance to the two circumstances that "soft" growth appears to be more susceptible to disease than "hard" growth, and that under certain conditions it is less conducive to fruiting. There are certain discrepancies in the observations so far, arising from the variations in the type of "softness," and these are being studied.

[1] Experimental and Research Station, Nursery and Market Garden Industries Development Society, Turner's Hill, Cheshunt, Herts. Second Annual Report, 1916.

In the later growing and fruiting stages the influence of fertilisers is under investigation, and also the effect of light, temperature, humidity, and other physiological factors. None of the artificial fertilisers produced any notable effect on the tomato crop; the withholding of phosphates caused some depression, but the withholding of nitrogen and potash had little, if any, effect. It must be remembered that the soil is virgin soil, and the results seem to be on a par with the old antagonism between vegetative growth and fruiting. Mr. Spencer Pickering obtained very similar results at Woburn in his manurial experiments with fruit trees and bushes. The result is contrary to the usual experience, and indicates that a marked distinction must be made between virgin soils and soils that have been in use for some time. The reason for the distinction, however, is not clear.

In the case of cucumbers, phosphates in some circumstances actually depressed the crop, as has been noted elsewhere with cotton and sugar-cane. The determining factor in the case of cucumbers under the conditions of the experiment was the temperature, and the experiments show in a striking way how easy it is for the leaves to become overheated in a glasshouse—a phenomenon already discussed by Francis Darwin. The cooler part of the cucumber-house gave in the first year 25, and last year 9, per cent. more fruit than the warmer part. Proper appliances have been installed for the study of this important problem, and the results will be awaited with much interest. E. J. R.

THE NEW FOOD ORDERS.

THE reduction of the available supply of certain articles of diet, especially of meat, flour, sugar, and potatoes, has had the effect of changing to some extent the point of view with regard to economy in diet. While until recently economy in all things was desirable, it has now become necessary to exercise, in addition, special economy in the case of the four things mentioned above. This is due partly to deficiency in means of transport, but, in the case of potatoes, chiefly to bad crops. It must also be remembered that the large proportion of the population serving in the Army or Navy require more than they had in their previous occupations. For these reasons, it has been recommended by some that those who are well-to-do should endeavour to utilise the more costly articles of food, leaving a greater supply of the less costly, but restricted, articles for those who cannot afford the former. With regard to the Army rations, there is some reason to suppose that the allowance of 16 oz. of meat per day is unnecessarily large, at all events for men in the trenches; perhaps it may be the cause of certain diseases which are apt to occur, such as "trench nephritis." This affection seems to have some relation to diet. The meat allowance might, with advantage, and probably with appreciation by the men, be exchanged for an equal energy-value in carbohydrate.

The new arrangement of rationing by bulk, as applied to restaurants, is undoubtedly an advance. As the present writer has pointed out in another place, the old system of limiting the number of courses led to an undesirable increase in the consumption of meat, as compared with other foods. The present allowance of 12 oz. of meat per day gives about 70 grams of protein, in addition to that in bread and other articles—a perfectly adequate supply. It is, however, not quite clear why households should be allowed only about 6 oz. per head. In some cases, no doubt, the smaller consumption by children compensates. But it must always be kept in mind that children require more protein in proportion to their weight than adults, since they are forming new body-tissues, and it is only up to a certain age that children require absolutely less protein than adults. It would probably be correct to say that quite half the total number of households consist of persons requiring the protein ration of adults. Of course, meat is not the only source of protein; oatmeal especially is an excellent source, and, at present, the necessary energy-value can be made up with this, at the same time as the increase in protein.

With regard to the materials to be added to wheat-flour, would it not be better to limit them to those not readily used by themselves, such as barley and rye? Beans, especially, seem to the writer an undesirable constituent of bread. If oatmeal, for example, is to be used in large quantities for mixing with wheat-flour, is it not probable that the price will rise considerably?

The new Order with respect to hoarding of food is rather difficult to understand. Presumably, it is not intended to prevent the purchase of fairly large amounts at a time, provided that these amounts are made to last as long as if bought in small parcels; nor to prevent the storage of sugar for the purpose of making jam by the householder in the autumn. W. M. BAYLISS.

A MINISTRY OF HEALTH.

WITH the terrible wastage of the lives of the best of the nation's manhood in the European conflict, and with a birth-rate the lowest on record, if the country is to recover after the termination of the war and to maintain its place among the nations as a great and thriving industrial Power, it will be necessary for us to conserve to the utmost those lives which we possess and those which we may expect to be born to us. While it may not be practicable at present to anticipate a definite increase in the birth-rate, though it is to be hoped there will before long be a change for the better, it is possible to do much to reduce disability and loss of life from preventable disease. The campaign against venereal disease, the crusade against tuberculosis, the care now being taken of munition and other workers, and the medical consultations at infant welfare