in different branches of science. Such cooperation has often resulted in many discoveries which might otherwise have been impossible. It does not, however, remove the lack of appreciation of viewpoints held by investigators trained in different branches of science. This appreciation is obtained by a systematic and intelligent course of study. Also, such cooperation is often impossible, particularly for research students in different departments. Too often much time is wasted by the individual in pointing out the mistakes and the shortcomings of the other, without helpful and constructive criticism.

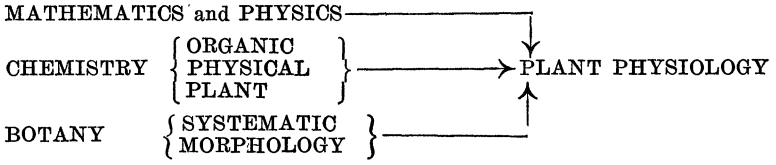
This lack of appreciation was recently called to our attention in a striking manner. An inquiry was made by a botanist about an astronomical publication on solar radiation. The astronomer replied that there was nothing in the article that could be appreciated or be of any value to a botanist. In contrast to this lack of appreciation for the necessity of cooperation we may quote a prominent scientist on the problem of photosynthesis:[9]

> . . . the chemical reactions constituting the photosynthetic processes are of a highly complex and intricate nature, sufficient investigation has been done to justify the conclusion that the problem is amendable to physico-chemical treatment. However no single academic division of science, such as botany, chemistry or physics is of itself sufficiently rich in concepts and methods to attack the problem adequately. . . . In view of the present academic divisions of the sciences and the variety of special training which is requisite for such undertaking, cooperative effort offers the only rational method of advance.

Again, we are told that an eminent chemist once said that the progress of our knowledge of photosynthesis has been retarded more than a hundred years by being in the hands of botanists. No statement was made as to the condition of our knowledge if it had been in the hands of chemists. It is not difficult to cite many examples in which valid criticism can be offered of chemical research on plant material because of lack of appreciation of the importance of plant structure and physiological processes.

We believe that the plant physiologist is largely a product of his training, and if his training does not prepare him to do research work which will develop his field of science, it is not, as a rule, satisfactorily acquired when the occasion demands. We also believe that the demand for plant physiologists will greatly increase when they are better prepared to handle the problems to be solved. As a step toward making it possible for those interested in research work in plant physiology to obtain the necessary fundamental training in the minimum amount of time, we suggest that a course in plant physiology be offered by the larger universities.

The following scheme may serve to show the relation of the fundamental sciences to plant physiology and suggest the necessary subjects.



It is understood, of course, that these subjects follow the usual prerequisites. A detailed outline of a course will depend upon conditions and individual interests.

It is quite probable that this course will not satisfy the requirements of any one department in most universities having a major and minor system. Thus it is necessary to have *departmental cooperation,* especially between botany, chemistry and physics. We believe that this *departmental cooperation* will greatly stimulate interest and facilitate *individual cooperation* which is necessary in the more technical and highly specialized branches of research in plant physiology.

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[9] Spoehr, H. A., *Jr. Ind. and Eng. Chem.* 14, p. 1145, 1922.

SCIENTIFIC EVENTS

THE BRITISH NATIONAL INSTITUTE OF POULTRY HUSBANDRY

THE selection of the Harper Adams Agricultural College as the site for the National Institute of Poultry Husbandry—the nucleus of the Ministry of Agriculture scheme for the development of the poultry industry—was influenced to a great extent by the value of the work already accomplished for poultry keeping at that institution.

The London *Times* reports that the equipment of the institute, which the Duke of York will formally open on November 3, is practically complete apart from the administrative building. For practical purposes the experimental station is already in operation, and during the present season important work has

been begun in breeding, hatching and rearing. Unfortunately, Professor Willard Thompson, the director, who is mainly responsible for the planning of the equipment, is returning to America next month, and his successor has not yet been appointed, though it is unlikely that the change will affect the continuity of the policy.

The institute will be devoted to the practical testing of scientific theories and knowledge. Information derived from purely scientific research at Cambridge and elsewhere will be submitted to investigation under practical conditions, and the results will be carefully analyzed and tabulated. Methods of housing will enter largely into the scheme, and criticism of some of the designs that have been adopted would be premature in view of the fact that the purpose is to break new ground and not merely to confirm principles already adopted in this country. For example, a square laying house, 20 ft. by 20 ft., of a type not uncommon in America, has been set up with a view to testing such accommodation for farm flocks, and it is claimed that a square building entails less structural cost than a long one. It remains to be seen, however, whether the window-space is sufficient and the interior adequately lighted to afford proper scratching quarters for a large flock of hens during an English winter.

The institute provides for a practical test of all systems of housing and rearing, while special interest attaches to its investigation of food problems. Some striking results have already been obtained by the use of milk in rearing chickens, and also for providing a supplementary food for laying stock in the place of meat and fish meal; and it would appear that where there is an economical supply of milk, such as is obtained at the institute from goats which subsist largely upon the herbage in the stock runs, a substantial gain will result. A portion of the experiment farm has been set aside for waterfowl, and pigeons and rabbits are also included in the scheme, which is likely to be of considerable benefit to the small farmer.

MORTALITY IN GERMANY

A CORRESPONDENT of the *Journal* of the American Medical Association writes as follows in regard to the effort of Germany to attain the lowest mortality rate in Europe:

For a century, Norway had the lowest mortality in Europe. As early as the middle of the eighteenth century, infant mortality in Norway was as low as it is to-day in the German *reich* because of the widespread application of advanced principles of social welfare. Hence, the chances of attaining old age in Norway were better than in other countries. In recent years, however, Germany, weakened by war and by scarcity of food, is among the nations in which mortality conditions are most favorable. Oberregierungs-Rat Roesle, in an article in the *Deutsche medizinische Wochenschrift*, points out that Germany does not lack much of holding the European low mortality record. As early as 1920, the mortality of Germany dropped to 15.1 per thousand of population, thus attaining very nearly the prewar minimum. In 1924 and 1925, the rate reached the low figures of 12.12 and 11.9, respectively. The contest with Norway, among the European nations, began in the first decade of this century, when the mortality rate of Denmark threatened to wrest the record from Norway. In 1912, the Netherlands, a new competitor, appeared. The mortality rate of the Netherlands for the years 1923, 1924 and 1925 nearly equaled the world record, which New Zealand, with a rate of 8.3, holds at present. In 1923, the rate for the Netherlands was 9.9, which was as low as that of Australia in 1924, and then dropped to 9.2. The lowest mortality rates after the Netherlands are recorded in Denmark (11 per thousand), Norway (11.1), Sweden (11.4), England and Wales (11.6), Switzerland (11.8), and Germany (11.9). In almost all those countries, however, the birth rate threatens to fall lower than the lowest birth rate record, heretofore held by France. Whereas in France the declining birth rate has, since 1922, been brought to a standstill, as was the case before the war, in all the countries with strikingly low mortality rates the birth rate has fallen markedly. Two countries, England and Sweden, have attained the minimum for France; Switzerland reached it in 1923. Also Germany's birth rate is only slightly higher than that of France. In 1924, the birth rate for Germany (living births) was 20.5 per thousand of population; the rate for France was 19.2, for England, 18.3, and for Sweden, 18.1. The low birth rate, therefore, which results in a low infant mortality rate, influences favorably the general mortality rate. Low mortality rates in the countries in which they obtain go hand in hand with low infant mortality rates. Since the war, a new record for infant mortality has been established. Previously, Norway, with a figure of 6.4 per hundred living births, had the lowest infant mortality, but Sweden for 1923 announced a rate of 5.6 and the Netherlands a rate of 5.7. Switzerland, England and Denmark reached the lowest infant mortality rates of record for their respective countries: 6, 6.9 and 7.7. Germany, whose infant mortality rate in 1921, 1922 and 1923 hovered around 13, in 1924 recorded a rate of 10.8, thus gaining a position among the countries with the lowest infant mortality rates. The most important aspect of the situation is the excess of births over deaths, which constitutes an expression of the natural increase in population. In increase of population the Netherlands surpasses all other European countries, with an excess of births over deaths of 10 per thousand of population, whereas the corresponding excess in Germany, England, Sweden, Switzerland, France, Belgium and Austria since 1922 has always been below that figure. Also the tuberculosis mortality rate for Germany has fallen considerably, and bids fair soon to overtake the countries with the best