sense of conviction as to the success of his work, that the properties of his material were identical with those published by Brunel. He was satisfied and so was I.

During the war Brunel interrupted his work to take up certain investigations on war gases suggested by the authorities in Washington. He studied with his customary care certain gases which were used to induce a copious flow of tears. Such gases served an important purpose in interfering with the preparations which are necessary before an attack is made. Lines of communication are shelled and, as a result, all work must be done by soldiers who are protected by masks. These cut down markedly efficiency and, consequently, slow up military operations. I had the pleasure of communicating to English chemists, who were working on the same substances, the results obtained by Brunel. As a result their efforts were turned to other problems.

JAMES F. NORRIS

SCIENTIFIC EVENTS

WORLD WHEAT PRODUCTION[1]

DURING the past ten years it has been realized that all the countries in the world have a common bond in the international trade in wheat. Various adjustments in relationships have perforce been necessary, but the six years which have elapsed since the war have given wheat-growing countries time to stabilize their positions and in some degree to accommodate themselves, on one hand, to the cessation of export from Russia, and, on the other hand, to the discontinuance of the artificially enhanced production prevalent during the war years. For this reason the agricultural statistics for 1923 published by the International Institute of Agriculture at Rome, with their comparisons with pre-war years, are of special interest, since they do at this stage indicate the trend which agriculture in general and wheat production in particular is taking throughout the world.

The situation as revealed by the year-book is, on the whole, reassuring. Except in Europe, both area and production in wheat show an increase over the corresponding figures for the period 1909–1913. In North America the increases in area and production are approximately 40 per cent. The year 1923 was admittedly a favorable one for wheat growing, but an examination of the annual returns shows that this increase is not an isolated instance. Europe is still 7.3 per cent. below its pre-war average in production of wheat, and 9.5 per cent. below its average area in that crop over the same period; but the area has increased steadily since 1920, and the production, notwithstanding fluctuations, has never fallen lower than it was then.

Russia is omitted from these returns, but the decrease in wheat production in that country during 1922, when famine conditions were at their worst, is now authoritatively stated as fifty-five and a half million quarters, or 65 per cent. of the pre-war average. In 1923 Russia had a small export trade. It will be remembered that, before the war, Russia was one of the chief sources of the world's wheat supply.

A good deal of attention has recently been directed towards the wheat production and crop balance-sheets of Canada and the United States. No appreciable decrease in area under cultivation in either country is recorded in the data published, but wheat production in both is less in 1923 than in 1922. Almost the whole of this loss can be apportioned to the United States, where increases in the more important crops of cotton and maize more than counterbalance it. Four million acres went out of wheat in 1923 and 5.4 million were added to the maize and cotton crops. Further, the excess of exports over imports of wheat has fallen from 32 million quarters in 1921 to 9.6 millions in 1923. Taken together, these figures would seem to afford a striking confirmation of the forecast made by the Bureau of Agricultural Economics in the U. S. Department of Agriculture Year-book for 1921. In a paper on "Wheat Production and Marketing," O. E. Baker says, "Wheat production, however, has been increasing less rapidly than population in this country, and it is very probable that this will continue to be true, at least until we reach the point where we consume practically all we produce." Such a state of affairs is obviously of very serious import.

The International Year-book has grown during its brief career, and this issue gives many more details than its predecessors. It is to be regretted that in so doing it has been thought necessary to discontinue some of the summary tables. That relating to the percentage of each crop, based on total area under cultivation in each country, is a noticeable omission. The book contains sections dealing with crops, live stock, trade returns, prices, freight charges, fertilizer consumption and rates of exchange, and will repay perusal not only by the agriculturist and economist but also by the interested layman.

THE TRANSMUTATION OF MERCURY

THE department of chemistry of the University of Chicago has authorized publication of the following statement:

Recent reports in the press indicate that Miethe, in

[1] From *Nature*.

Germany, and Nagoaka, in Japan, believe they have converted mercury into gold by the use of large currents in a mercury arc lamp. If this is true it has probably resulted from the shooting of an electron into the nucleus of a mercury atom, which would convert it into an atom of gold provided the electron should remain in the nucleus. It must be said that the velocities given to electrons in a mercury arc lamp are much smaller than those which may be imparted in other ways, and that present atomic theories seem to indicate that it is exceedingly improbable that such slow electrons could get at the nucleus. However, the success of the work of Miethe and of Nagoaka can be tested only by experiment, and if they are proved successful, the theories must be changed to account for their success. Such experiments will need to be extremely careful and convincing.

Work has been begun in this laboratory on the method by means of which electrons with thousands of times higher velocities are shot into mercury in order to see if they attach themselves to the mercury nuclei and thus produce gold. It is the opinion of those who have begun this work that even these greater concentrations of energy will be insufficient, and that still more powerful and expensive sources of energy may need to be applied. That gold happens to be the element which might be produced by such a process is of no scientific, and probably of no practical importance, since if any other element could be prepared in the same way it would be of the same interest to science, and any gold produced would be enormously more expensive than the commercial value. The choice of these elements for the scientific work is entirely due to the fact that mercury is easily separated from gold, and gold in extremely small amounts may be detected.

THE ROYAL PHOTOGRAPHIC SOCIETY

THE Royal Photographic Society of Great Britain is holding its seventieth annual exhibition in September and October of this year. This is the most representative exhibition of photographic work in the world, and the section sent by American scientific men heretofore has sufficiently demonstrated the place held by this country in applied photography. It is very desirable that American scientific photography should be equally well represented in 1925, and, in order to enable this to be done with as little difficulty as possible, I have arranged to collect and forward American work intended for the scientific section.

This work should consist of prints showing the use of photography for scientific purposes and its application to spectroscopy, astronomy, radiography, biology, etc. Photographs should reach me not later than Saturday, June 14. They should be mounted but not framed. There are no fees.

I should be glad if any worker who is able to send photographs will communicate with me as soon as possible so that I may arrange for the receiving and entry of the exhibit. Address

EASTMAN KODAK COMPANY, A. J. NEWTON
ROCHESTER, N. Y.

THE EASTERN NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY

IN accordance with its new policy of distributing its regular meetings among the towns in its territory, the eastern New York Section of the American Chemical Society held its one hundred and twenty-fifth regular meeting in Troy in cooperation with the Rensselaer Polytechnic Institute, on March 31. Dr. Zay Jeffries, of the Aluminum Company of America, addressed the meeting on "Aluminum."

About 300 engineering students of the institute attended the meeting. Dr. Jeffries showed rare ability in selecting his topics, so that his address appealed to the engineers and to the scientific men alike. A large number of the local members of the Association of Steel Treaters also attended the meeting from Watervliet and Schenectady.

Dr. Palmer C. Ricketts, director of the institute, presided. Before the meeting, the members of the section from Schenectady, Albany and the other towns around Troy were entertained by Dr. and Mrs. Ricketts at their home with a buffet luncheon.

At the conclusion of the meeting, a party was organized for a tour through the engineering laboratories of the institute. The Troy division of the section certainly managed the affair in fine shape, and a hearty vote of thanks was extended them at the close of the address of the evening.

Dr. Charles A. Kraus, head of the department of chemistry of Brown University, addressed the one hundredth and twenty-sixth regular meeting of the section in the Research Laboratory of the General Electric Company, on the morning of April 4, on "The amphoteric nature of the elements."

His lecture was concerned with his own research work on liquid ammonia solutions, a field in which Dr. Kraus is the acknowledged authority to-day. By applying the accepted theory for atomic structure, he showed that all elements should be either electropositive or electronegative, depending only on circumstances. Until Dr. Kraus started his investigations on ammonia solutions, most of the elements were electropositive, and very few could be made to show any other set of properties, for the reason that in any other state these elements, and their resulting compounds, were extremely reactive, especially to moisture.

Such compounds have now been prepared and worked with. Particular emphasis was placed on the uncommon properties so revealed by such a common element as lead. In many cases, Dr. Kraus was able to foretell his experimental results with surprising accuracy, showing his theory to be correct.

Dr. Kraus emphasized his belief that some such