numerals, the metric system, the measurement of latitude and longitude, angular divisions, mathematical symbols, chemical formulæ, time and the calendar, notation in music, and other technical usages; and

WHEREAS, There appears to be a generally expressed need for a suitable international auxiliary language for the prompt and world-wide diffusion of scientific data, and for intercommunicating between nations differing in languages;

THEREFORE, BE IT RESOLVED, That the American Association for the Advancement of Science:

(*a*) Recognizes the need and timeliness of fundamental research on the scientific principles which must underlie the formation, standardization, and introduction of an international auxiliary language, and recommends to its members and affiliated societies that they give serious consideration to the general aspects of this problem, as well as direct technical study and help in their own special fields wherever possible;

(*b*) Looks with approval upon the attempt now being made by the National Research Council and the American Council of Learned Societies to focus upon this subject the effort of those scholars in this country best fitted for the task, and to transmit the results to the appropriate international bodies;

(*c*) Indorses the heretofore relatively neglected problem of an international auxiliary language as one deserving of support and encouragement;

(*d*) Continues its Committee on International Auxiliary Language, charging it with the furtherance of the objects above enumerated and reporting progress made to the association at its next meeting.

A Resolution bearing on the Introduction of the Metric System in the United States.

WHEREAS, The metric system of weights and measures has been favorably endorsed by many societies and organizations affiliated with the A. A. A. S.;

WHEREAS, The A. A. A. S. has by resolution of its governing Council already affirmed its belief in the desirability of adopting the metric system by the United States; and

WHEREAS, Legislative bills aiming to bring about the adoption of the metric system have been introduced in Congress;

THEREFORE, BE IT RESOLVED, That the A. A. A. S. urges on Congress the passage of legislation which will go farther than the present legislation (which permits the use of the metric system) and will require the use of the metric system in such branches of trade and commerce as are subject to general direction and regulation by the government of the United States.

A Resolution bearing on the Appointment of the U. S. Commissioner of Fisheries.

WHEREAS, The United States Commissioner of Fisheries has presented his resignation; and

WHEREAS, The position is one demanding, for the proper discharge of its duties, technical knowledge of the scientific work of the fisheries and their utilization for the benefit of the nation, as well as administrative skill and experience;

THEREFORE, BE IT RESOLVED, That the Council of the American Association for the Advancement of Science desires to emphasize, in connection with the selection of a new commissioner, the prime importance of securing a man who possesses both the special experience and scientific knowledge of the field, combined with the necessary administrative ability for discharging the duties of the position; and

BE IT FURTHER RESOLVED, That copies of this resolution be sent to the President of the United States and to the Secretary of Commerce.

RESEARCH IN THE FIELD OF AGRICULTURE

THE one big agricultural lesson which the War has driven home is a realization of the definite relation between the world's increasing population and the amount of food material of all kinds which it is possible to make the civilized and war-free portions of the world produce. Never before have we realized so clearly as now that the population of the world is crowding closely upon its present limits of food production and that some countries in fact for a long time have fallen far short of their needs in their own production of food. In spite of all the recent development in aerial navigation, wireless communication, manufacturing, and extension of transportation facilities and of trade, agricultural productivity, just as much as ever, remains the foundation of our well being. And the significance of all this is that agriculture must be made increasingly intelligent and must lay hold of all that science can offer to meet the ever increasing demand not only for food but for better foods.

There is a broadening opportunity, then,

for investigation of agricultural problems and for applying our best knowledge of the principles of chemistry, engineering, biology, sociology, and economics to the production, distribution, and consumption of food and of the raw materials of manufacture. The man who by reason of his intelligence can take advantage of our knowledge not only to make two ears of corn grow where only one grew before, but to make those two ears higher in their nutritive value or to convert a higher percentage of their food value into ultimate human energy through the mechanism of a steer, a pig, or a grist mill and bakery, will make his mark and will render a service to humanity in which he can take solid satisfaction. There are scores of careers open in connection with the many, many unsolved or partially solved agricultural problems for young men and young women who have the brains and educational equipment to tackle them. Research in agriculture not only adds to the sum of human knowledge; it adds to the amount we may have to eat, to the comfort of the clothes on our backs, to the cheapness of all these necessities, and to the amount of money we may all have for the enjoyment of the other things of life.

Our knowledge of the physics and chemistry and biology of the soil, for instance, needs re-study in the light of the modern development of these sciences and the perfection of instruments and methods in these fields of research. These newer methods must be applied to the study of fertilizers and their action, and to plant and animal nutrition. The fat soluble A's and the water soluble B's must yield their secrets. The problems of disease resistance and immunity must be reinvestigated by the newer methods now available. We must perfect instruments and methods for the study of the ultra-microscopic organisms and disease producing agencies as the physicists have done in the study of the atom and electron. We do not yet know the causative agent of the mosaic diseases which are becoming more destructive to many of our important crops each year. Peach yellows is almost as great a mystery as it was in the beginning. We do not know the causative agent of hog cholera and a number of other destructive diseases of live stock. The newer chemistry and physics applied to the study of plant and animal physiology are opening a new chapter in those fields. Many obscure problems in storing and transportation of perishable fruits and vegetables are yielding to these newer methods of study.

Plant and animal diseases reduce our food producing efficiency fully 20 per cent. per annum on the average. Our understanding of them and the methods of controlling them is still very imperfect. The whole field needs reworking by men trained in the newer methods and in the light of our modern knowledge. The idea of the fixity of species and their special creation has only recently been laid to rest. We are just entering the field of genetics and plant and animal breeding. What has been accomplished so far has depended upon chance variation and selection. We are only just beginning to unravel the laws governing variation and heredity. What powers the greater and more exact knowledge may give us we can only dimly conjecture now. The new physics, chemistry, and biology are yet in their infancy. They are our keys to greater knowledge. Our modernly trained scientist who is to devote himself to the building up of the new agricultural science must have these keys at his command. He must prepare himself with the same thoroughness that the modern chemist or physicist prepares for his work. He will need also to learn the art and necessity of cooperation. One mind cannot compass the whole field. The advance of the future will be made largely by closely cooperating groups of chemists, physicists, biologists, pathologists, etc. The colleges and universities must study and promote every phase of this great problem. They must find the leaders and the promising students and provide them with all they need for their work. The field is an attractive one for those who desire to render great service and who love the joy of discovering truth. The scientists, the inventors, the teachers, the poets, and the writers devote their energies to these fields for the love of the work and the joy that acknowledged accomplishment brings. It

is something that money cannot buy. The financial reward is seldom thought of. Nevertheless it is coming to be an important accompaniment.

The universities and colleges are being heavily drawn upon by commerce and industry for trained thinkers and investigators. Great private foundations must go to the universities for trained men. Governmental agencies, state and national, can not find enough trained students to meet their needs. The experiment stations and the national Department of Agriculture are constantly in need of more and better trained personnel. While salaries offered by government and state agencies are usually not as large as those paid in the industrial world there are other compensations. There is a strong and increasing demand for men trained in the various branches of agricultural science. Work of this kind in foreign fields is very attractive to many. The state universities and agricultural colleges are awake to the new needs. They are organizing their research with the cooperation and backing of the national and state governments, with a view to encouraging the promising investigator and student and to maintaining the vivifying atmosphere that the research spirit and accomplishment gives to the university. Thorough preparation not too specialized in the first two or three years is essential to future success. The basic sciences, mathematics, physics, chemistry, and biology, together with a knowledge of modern languages must be stressed with the specialized work in the selected field.

In the graduate schools the development in the next few years will doubtless be along the line of developing special research facilities in particular fields. It should be possible to find there the men, the books, the laboratories, and the equipment necessary for the most effective investigation in the particular fields stressed. This would bring about a greater interchange of students which would be good for the university as well as the student. There never has been a time when the need for agricultural research of the first order was as necessary as it is today. The growing recognition of this need and appreciation for the service that may be rendered promises well for the future. The call for prepared and devoted workers should be heeded by the best young men and women of our colleges.

A. F. WOODS
UNIVERSITY OF MARYLAND

SCIENTIFIC EVENTS

INVESTIGATION OF CARBON MONOXIDE POISONING

IN order to make accurate observations for determining and treating carbon monoxide poisoning among those employed in mines, metallurgical plants, and tunnels, a number of investigations are being conducted at the Pittsburgh Experiment Station of the United States Bureau of Mines.

Methods of collecting and preserving blood from persons affected or overcome by carbon monoxide have been investigated and developed. Blood samples were collected in various parts of the United States, forwarded to Pittsburgh, and there examined. A preliminary report has been submitted.

The following methods of analysis of blood in the presence of carbon monoxide have been studied by Bureau of Mines investigators: Haldane's picrocarmin method, tannic acid method, spectrophotometric method, and the Van Slyke gasometric method. The Haldane picrocarmin method proved to be the least desirable, being very inaccurate with low concentrations; the tannic acid method was accurate but tedious; the spectrophotometric method was accurate and rapid, but required expensive apparatus; the Van Slyke method was the most dependable, but it required a comparatively large sample, 2 to 4 c. c., for each determination. A report on these methods of analysis has been submitted.

A study of the feasibility of using in first-aid work a mixture of carbon dioxide and oxygen, first recommended by Dr. Yandell Henderson, for resuscitation of persons overcome by carbon monoxide was conducted on both dogs and men. Results indicated that in its present state of development the method is not feasible for use by first-aid men.

In the conduct of the above investigations a superior method for the selection of analysts for color work in chemistry was developed,