measurement of all phenomena that can be measured is needed. The survey method is, indeed, but a name for the proper combination of all inductive methods in the scientific study of the social life. But therein lies its promise of becoming an adequate method for the social sciences of the future; for no method will be adequate in their complex field which is not synthetic. As their inductive instrument the survey method of studying social facts will not preclude the social sciences from making full use of psychology, biology and geography. For social facts could not be interpreted, as we have seen, without the use of these antecedent natural sciences; and hence any method to be fully scientific must be a synthesis of inductive results

It may be objected that the use of such a complex, synthetic method in the social sciences will be beyond the ability of ordinary minds. That I do not believe. To be sure, the level of scholarship in the social sciences will have to be raised before it can be used successfully. I am not, however, among those who believe that the present level of scholarship in the social sciences is lower than in the so-called natural sciences. I believe the contrary. But I would urge that the grave responsibility resting upon us as leaders of social thought, as well as the complexity of the problems with which we deal, demands higher standards of scholarship among us than among the students of the natural sciences. In this grave crisis of our civilization it is time that we recognize this fact. It particularly demands that we be more than mere specialists in economics or administration, in history or anthropology, in education or law; but that we have that breadth and depth of scholarship which will enable us to see on all sides of, and to the bottom of, our particular problem.

The practical difficulties, however, of employing such a comprehensive, synthetic instrument of social investigation can not be ignored. The survey method of social investigation is still very far from being developed to the point which I have described. It can not be so developed without the aid of governmental and educational agencies. It is the same with the social sciences as with all sciences, that they can not flourish without the aid and encouragement of society at large, especially through governmental and educational institutions. I believe, however, that such aid will be forthcoming if we keep our standards of scholarship sufficiently high, and work together to show the need for the development of all the social sciences.

In this crisis, therefore, let us who are students of social life close up our ranks and work together for the establishment and diffusion of that accurate social knowledge for lack of which the world seems almost on the point of perishing; for this crisis has clearly demonstrated that it is to the social sciences, not to the physical sciences, to which the world must look for its salvation. And it is upon us who are students of the social sciences that the responsibility for their future development and usefulness to humanity must rest.

CHARLES A. ELLWOOD
UNIVERSITY OF MISSOURI

WORK OF THE NATIONAL RESEARCH COUNCIL

MAJOR R. A. MILLIKAN, vice-chairman of the National Research Council, wrote, on September 7, a letter to Dr. Cary T. Hutchinson, secretary of the Engineering Foundation, reviewing the work of the council. The letter as "edited for publication" in the *Proceedings* of the American Institute of Electrical Engineers is as follows:

The following is a statement of some of the work of the National Research Council, condensed with difficulty on account of the great variety and scope of the council's activities.

All of the work of the Research Council that touches upon Army or Navy problems is carried on with the advice, cooperation or control, as the case may be, of the representatives of the various departments of the Army or Navy under which such work comes.

The council has cooperated in the establishment and organization of the submarine experimental work at Nahant and has also established a very active submarine station at New London, another at San Pedro, California, and has been instrumental in the organization of groups working at New York, Chicago and Madison, Wisconsin.

There has resulted a great practical advance in the art of submarine detection which it is not desirable to go into further.

The physics committee of the council has distributed to various groups twenty or more large problems in physics, which are being actively worked upon and some of which have already been solved. Among the latter are the location of aircraft by sound, the development of fire control for anti-aircraft guns, telephoning between airplanes, protection of balloons from ignition by static charges and the development of new and improved methods of measuring muzzle velocities.

The chief officer of the signal corps of the Army has asked the Research Council to act as the Division of Science and Research of the Signal Corps, and in this capacity the council has organized a sound ranging service in the signal corps, a new meteorological service in the signal corps, and is now drawing specifications for scientific instruments to be used on airplanes. It has sent a dozen of the best physicists in the country to France to aid the American Expeditionary Forces with their scientific knowledge and is selecting a personnel of several hundred men who are to be engaged in the scientific services of the Army and Navy.

The chemistry committee has perfected an elaborate organization for the handling of all of the chemical problems which arise in the Army and in the Navy, and it has distributed some 150 chemical problems which are being attacked in the chemical laboratories of the country.

The psychology committee has presented to the Secretary of War and the adjutant general a vast program for the selection of officers for the Army from officers' reserve camps and for the classification of drafted men. In fact it has called in most of the best known psychologists of the country and has organized them and employment experts into a large group in whose hands the War Department has placed the largest responsibilities regarding the examination and selection of men.

The medical committee has enlisted the services of a large number of medical men of the country both in medical research problems and in the regular work of the sanitary corps of the Army.

The engineering committee has contributed in no small degree to the development of devices for the protection of ships from submarines. It has organized a large group which are now working on the development of steel protective devices for use of the soldiers at the front, and through cooperation with the National Advisory Committee for Aeronautics it has carried on extensive and important researches in the development of airplanes and airplane engines.

Turning to the work of the special committees of the council, the nitrate committee has made an elaborate study and report which has been made the basis for the expenditure by the government of large sums of money upon the erection of a nitrate plant.

The gas warfare committee has had for six months 120 chemists working on the problems of gas warfare and the results already attained have been of the utmost importance—so important that the Army and Navy have placed large appropriations at the disposal of this committee for its researches.

The optical glass committee, by taking from the research laboratories like the geophysical laboratory and the bureau of standards, a dozen more silicate chemists and putting them directly in the works of the Bausch and Lomb Company and the Pittsburgh Plate Glass Company, has in six months' time developed in America the production of optical glass from nothing up to 20,000 pounds a month and in two months more this figure will have been multiplied two or three fold.

The psychiatry committee has established abroad a laboratory for the study of shell shock.

The foreign service committee, which the council sent abroad at once upon the outbreak of the war, was wholly responsible for the sending back to this country of a French, English and Italian scientific mission, which brought with them the contributions which science had made to the war, both in the matter of instruments and methods, and unquestionably saved months of time in putting the United States abreast of the European situation, as regards modern scientific methods in warfare. It is difficult to overestimate the stimulus to American participation in the war which resulted directly from the action of the Research Council in sending abroad at once this foreign service committee composed of seven of the best scientists in the country.

These are a few of the results which have followed from the assistance which the engineering foundation gave in the bringing into being of the National Research Council. It is hoped that they are only a small part of the results which will have been attained by the end of the second year of its existence.

SCIENTIFIC EVENTS

CELEBRATION IN HONOR OF DR. HENRY FAIRFIELD OSBORN

ON the afternoon of September 29 a large and informal gathering of friends surprised Dr. Henry Fairfield Osborn at his home at Garrison-on-Hudson in honor of his sixtieth birthday. The visit had originally been planned for August 8, his birthday, but was necessarily deferred until September 29, which chanced to be the thirty-sixth anniversary of his marriage with Mrs. Osborn. The American Museum of Natural History was represented by Mr. Madison Grant of the board of trustees, by the members of the scientific staff and their wives, by the members of the department of vertebrate palæontology and of the administrative and technical staffs and their wives. The New York Zoological Park and the New York Aquarium, Columbia University and Princeton University were also represented. The weather was favorable so that the arrangements for luncheon on the lawn were enjoyably carried out. After the luncheon Professor Edmund B. Wilson, of Columbia, read congratulatory messages from Colonel Theodore Roosevelt, President Nicholas Murray Butler, and Mayor Mitchel, and presided at the addresses, the speakers including Mr. Madison Grant, Professor McClure of Princeton, Mr. William Church Osborn, Professor Bashford Dean, and Dr. Frank M. Chapman. Dr. F. A. Lucas gave a discourse on "Birthdays," after which he presented to Professor Osborn an illuminated message of congratulation bearing forty-six signatures. The text of this message and the signatures were as follows:

TO

HENRY FAIRFIELD OSBORN

Your friends, who are bound to you by many years of treasured association, bring this message of congratulation upon your sixtieth birthday.

We have followed with increasing admiration the progress of your labors during the past forty years in an ever widening field of science. We are proud of the splendid record of your achievements: admirable researches accomplished and in progress, great institutions of science and education founded and fostered, high scientific ideals nobly illustrated and practised.

May the coming years further expand the orbit of your influence. May your spirit of high enthusiasm, thoroughness and unwearying industry, sustained by the cordial sympathy and cooperation which you have always shown towards others, become more and more characteristic of American science.

J. A. ALLEN,	EDMUND B. WILSON,
L. P. GRATACAP,	WM. H. CARPENTER,
GEORGE F. KUNZ,	BASHFORD DEAN,
E. O. HOVEY,	HENRY E. CRAMPTON,
FRANK M. CHAPMAN,	T. H. MORGAN,
JONATHAN DWIGHT,	GARY N. CALKINS,
ROY W. MINER,	J. HOWARD MCGREGOR,
W. D. MATTHEW,	W. B. SCOTT,
WALTER GRANGER,	CHAS. W. MEAD,
BARNUM BROWN,	CHESTER A. REEDS,
A. HERMANN,	JOHN TREADWELL NICHOLS,
WILLIAM K. GREGORY,	CLEVELAND H. DODGE,
FREDERIC A. LUCAS,	MADISON GRANT,
THEODORE ROOSEVELT,	PERCY R. PYNE,
N. L. BRITTON,	W. T. HORNADAY,
GEO. H. SHERWOOD,	CHAS. H. TOWNSEND,
R. W. TOWER,	C. W. BEEBE,
MARY C. DICKERSON,	RAYMOND L. DITMARS,
PLINY EARLE GODDARD,	S. H. CHUBB,
CLARK WISSLER,	ALBERT THOMSON,
FRANK E. LUTZ,	E. S. CHRISTMAN,
FRED H. SMYTH,	A. E. ANDERSON,
GEO. N. PINDAR,	H. LANG.

August 8, 1917

THE LABORATORY OF THE U. S. FISHERIES BIOLOGICAL STATION AT WOODS HOLE

THE work of the staff at the station of the Bureau of Fisheries at Woods Hole during 1917, has been concentrated during the summer on problems directly bearing on the conservation of food fishes and the utilization of marine forms not now appreciated in this country as food. Researches on the best methods of desiccating fish for storage, on the rehydration of dried fish and on the food value of such preparations were undertaken by Dr. G. G. Scott, of the College of the City of New York. Observations on the relation of parasites, especially nematodes, to the edible qualities of food fishes were made by Dr. Edwin Linton of Washington and Jefferson College. Investigations on the bacteriology