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THE SEMI-CENTENNIAL CELEBRATION OF THE SOCIETY OF SIGMA XI[1]

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND THE SOCIETY OF SIGMA XI

THE president of the American Association for the Advancement of Science has been asked to extend the greetings and congratulations of the association to the Society of Sigma Xi on the fiftieth anniversary of its birth and to point out the parallelism between these two organizations. Both have one function in common, the promotion of science, both seek to accomplish this by scientific meetings and publications and by the award of honors and grants-in-aid of research. But the association seeks to correlate all branches of science and to secure the cooperation of all persons who are seriously interested in its promotion, while Sigma Xi is an honor society for those who have shown ability as investigators and who constitute a selected group of "Companions in Zealous Research."

The American Association is the largest, most democratic and one of the oldest scientific bodies on this continent. It was organized in 1848, though its antecedents go back to the American Geological Society,

[1] Held at Cornell University on June 19 and 20. After the introductory addresses here given, there was an address by Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, on "The Service of Sigma Xi in the Universities of the Future." This was followed by a reception and a buffet dinner in Willard Straight Hall. In the evening Dr. Max Mason, president of the Rockefeller Foundation, gave an address on "Science and the Rational Animal." On Saturday morning Dr. William F. Durand, president of Sigma Xi, presented the semi-centennial prizes, and addresses were given by Dr. Willis R. Whitney, vice-president of the General Electric Company, on "The Accomplishments and Future of the Physical Sciences" and by Dr. Frank R. Lillie, of the University of Chicago, president of the National Academy of Sciences, on "The Accomplishments and Future of the Biological Sciences." The concluding exercises consisted of the presentation of the Sigma Xi Memorial in front of Sibley College.

which was founded at Yale in 1819. The association now consists of 15 sections, representing different branches of science, and it has more than 18,000 members residing in all parts of the United States, Canada, Mexico and in nearly 60 foreign countries. Associated or affiliated with it are over 150 other scientific societies, with a total membership of more than 500,000 persons. One of these affiliated societies is Sigma Xi.

The association is thus one of the most important organizations in the world for the promotion of science. It is a forum before which scientists bring their discoveries and theories for discussion and criticism; it is a migratory educational institution, which by means of public lectures and exhibitions in different cities carries the spirit, aims and results of science to the general public; it is an important factor in helping to solve some of the most serious social problems of the present day.

These two organizations, as well as the many special scientific societies, have for their object "the increase and diffusion of knowledge among men." Each of our societies supplements and complements the other. In 1921 the association invited Sigma Xi to cooperate in our annual meetings by providing a Sigma Xi lecture and these have been outstanding events of convocation week.

The American Association for the Advancement of Science congratulates the Society of Sigma Xi upon its notable record and wishes for it a future of ever greater service to science and mankind. We are especially appreciative of the program of this semi-centennial celebration, which emphasizes the relation of scientific research to social progress.

This last is a particularly live topic at this time when many persons are charging that science is responsible for wide-spread unemployment and are suggesting that scientific research should be halted until social progress has had time to catch up—which would certainly never happen. The depression has brought out a flood of books and articles on this subject, non-scientists often calling for a moratorium on research, while scientists call for an extension of science and scientific methods to the solution of social problems. Eminent British scientists have shown that modern society does not suffer from too much science, but from the "frustration of science" by the present social order. This is certainly a timely topic for a society devoted to the promotion of scientific research.

The marvelous advances in the production of food and clothing, of housing and transportation that have been made possible by science are known of all men. How has the social order met these advances? Superabundance of farm products is said to be one of the greatest social problems. And so on the one hand we find governments destroying or limiting the production of coffee, sugar, cotton, corn, hogs, calves, milk, potatoes, while on the other hand agricultural departments, colleges and institutes strive to increase them. It is easy to point out this absurdity, but not so easy to prescribe a remedy. However, it is certain that scientific progress in agriculture and industry will continue and the remedy must be found in a wider distribution of the products of scientific research.

In similar manner scientific progress in medicine and sanitation is far in advance of its social utilization but not in advance of its urgent need. Knowledge of heredity, eugenics, birth control and the means of improving our human stock is so far in advance of its practical application that the race is likely to suffer irreparable loss before this knowledge is put in practice.

And in similar fashion it might be shown that scientific progress in finding ways of protecting society against criminals and social parasites is far in advance of its general adoption; that rational and peaceful means of preventing wars are vastly less costly and more effective than armaments; that scientific control of population and the necessities of civilized life are far more humane and progressive than to leave these to nature and the law of the jungle. Here are some of the appalling contrasts between *scientific progress* and *social stagnation:*

Overproduction	*contra*	Underconsumption
Improved transportation	"	Unimproved distribution
Vast prosperity	"	Appalling poverty
Multiplied occupations	"	Unparalleled unemployment
Triumphant medicine	"	Widespread disease
Prolonged life	"	Useless and dependent old age
Scientific internationalism	"	Economic nationalism
Greater armaments	"	Less security
Larger social units	"	Less social unity
Elimination of unfit and survival of the fit	"	Protection of the unfit and elimination of the fit

The longer this list is made the more it appears as a conflict between progress and stagnation, knowledge and conduct, science and the social order.

It is easier to recognize symptoms than to diagnose causes, and both are easier than to prescribe remedies. The most fundamental cause of these contrasts is the conflict between altruistic science and acquisitive society, one working for abundance, the other for scarcity; one for goods, the other for prices. The profit motive is probably inevitable and not wholly undesirable, but in any stable society it can not be the chief or only motive.

Different nations are now trying different remedies for this disparity between scientific knowledge and social practice. Communism, in so far as it is based upon the ideal that all men are equal in ability or character or social value, is scientifically false. In a democratic society all men are not and never will be equal in power, wealth or social value, but they do have equal rights to life, liberty and opportunity. Leadership of wealth may be as useful as any form of leadership—witness our great educational, charitable and scientific institutions established by private endowment. All "share the wealth" programs would be ineffective to change effectively the present status. Sharing all income above $5,000 would give only $200 to each of twenty million families, or approximately $50 to every man, woman and child in the United States.

Fascism is no satisfactory solution of the problem of insuring life, liberty and opportunity to every person. It destroys liberty of press, speech, thought and conscience; it censors science and religion, reduces the mass to the condition of robots and cannon fodder. It is based on war psychology, does not educate the people for peace and freedom, puts everything under a dictator who must maintain a reputation of supernatural grandeur. It may work well for a time, but always ends in disaster.

"Rugged individualism" in the sense of "every man for himself and the devil take the hindmost" is no remedy for the present ills of society. We have had too much of this in the past to be content to go back to it now. It served well in a pioneer stage of society, but will not work in a crowded state.

Democratic socialism seems to me the safest and sanest social order. It avoids the extremes of communism, fascism and individualism, and yet contains elements of all these, and as such it conforms to that inexorable biological principle of the necessity of preserving balance between contrasting principles or opposing forces. Fanatical extremes of individual freedom or of social regimentation have no successful prototypes in biological or human history. Democratic socialism best preserves this balance in the social order.

It best preserves freedom of experimentation. The scientific method of learning is by experiment, trial and error, and finally trial and success. There is no other path of progress. Many mistakes are made, but with freedom to experiment they will be eliminated. This is the great advantage of free government. In this sense it is true, as Lincoln said, that "A free government is better than a good government."

Democratic socialism is best for the education of the masses. The ultimate aim of all education, whether of children or nations, should be to fit for freedom and cooperation, and both children and nations must learn by experimentation.

The spirit of science and the method of science must spread to society and government. Scientists must take a more active part in solving social problems. Such progress will be slow but sure. Science and ethics are the chief hopes of social progress.

EDWIN G. CONKLIN

PRINCETON UNIVERSITY

RESPONSE TO ADDRESSES OF WELCOME

President Farrand, of Cornell University, and President Conklin, of the American Association for the Advancement of Science:

ON behalf of the Society of Sigma Xi, let me thank you most warmly for the gracious and kindly words with which you have signalized this occasion—the fiftieth anniversary of the birth of Sigma Xi. Our appreciation to you, President Farrand, because you represent Cornell University, the place of our birth, the source of our early inspirations and the mecca of our members on this, our fiftieth birthday; and to you, President Conklin, because you represent the American Association for the Advancement of Science, the fostering mother of the organization of science in our country, and because we are honored here to-day by the presence of that great organization in an official and collective sense, as a participant in the events which are intended to mark this occasion.

We thank you both for your kindly words and for the generous terms with which you have referred to our society and to its work during this first half century of its life.

In particular, I would wish that your kindly welcome and generous words should be understood as intended, not only for those who have the good fortune to be here present on this occasion, but also, more widely, for all our members, no matter where they may be found, in this broad land or beyond the seas. Doubtless they are here in spirit, perhaps through the wizardry of modern radio; others, at a later time, may read in printed word some account of these exercises, and I would hope that all such will feel that your words are addressed to them as well as to those within the immediate reach of your spoken words.

We are, as you have said, here to celebrate the fiftieth anniversary of the organization of the scientific honor Society of Sigma Xi. The present moment is not the time for any detailed reference to the history of this event or to the history of the society during this past half century. This will come appropriately at a later time in our exercises as you will note from your programs.

If I may, however, be allowed a word, more personal in import, I would take the opportunity of ex-