SCIENCE SERVICE CONFERENCE. II

By Dr. FRANCIS G. BENEDICT

DIRECTOR OF THE NUTRITION LABORATORY, CARNEGIE INSTITUTION OF WASHINGTON

THE popularity of the spread of medical knowledge, knowledge of physiology and dietetics, is represented by the more common general interest in these subjects. There are probably more readers of Science Service who are interested in the medical news than in any other special classification. Consequently, it is one of the greatest services that can be rendered to the public, and likewise capable of very great errors. To the astronomer, and in the reporting of astronomical results, it is a matter of relative unimportance whether there is an error of one million or more light years, but to the general reader it is a matter of very great importance when there is an error made in the announcement of a medical or dietetic discovery.

The cautions outlined by Dr. Flexner seem to me to be absolutely essential. I could cite experiences where announcements by the press of medical discoveries or therapeutic discoveries have really wrought havoc. The influence of Science Service in bettering these conditions can hardly be overestimated, and we owe it a great debt for this step for the better. It has been stated here that we have no measure of the accuracy of newspaper reporting, but I feel that each of us has a very good measure, for if each one of us will take those subjects with which we are perfectly familiar and compare the factor of accuracy in the press reports of our own subjects with the press reports of other sciences and note what percentage of them are correct, we have a very fair measure of accuracy.

This comment on the inaccuracy of the presentation of medical matter in the press deals obviously only with those matters not handled through Science Service, and I wish to emphasize the extreme importance of the most careful control in medical or hygienic statements that are so readily and easily misinterpreted. In our modest field of endeavor many would be astonished to know some of the actual experiences we have undergone with pathetic cases of people arriving at our front steps in the belief that we had a new cure for diabetes, or something of that kind. It is, of course, infinitely worse with cancer cases. My comments are chiefly as a hint or particular warning to Science Service to exercise even greater scrutiny in releases of a medical nature.

Covering such a wide variety of scientific and other subjects, it is almost impossible to secure uniformity and equality of accuracy in all branches, and I think Science Service is to be congratulated on having done it so well. It is obvious that as years go on the service will improve. Were I located in Washington, I should be only too glad to offer my services gratuitously, in so far as they could be used, for any assistance in this work.

By Dr. PAUL R. HEYL

PHYSICIST, BUREAU OF STANDARDS

SCIENTIFIC discovery has its maxima and minima. There are times when there is first magnitude news to write about and there are no doubt other times when it is difficult to fill up the columns of the *Science News Letter* with things of the first importance. As a suggestion for possible sources for such periods, I wish to recall some experiences of my own student days. At that time it was frequently the custom of the presidents in both the British and American Associations to give a review of their sciences during the past year or often to go further and set forth the logical development of our ideas on a certain subject from primitive times up to the present. Such reviews were of great value to me in my student days in the formation of a perspective in dealing with the subject. I have found in later years that such reviews are still of interest to the lay audience. A historical résumé of our old and new ideas on a particular subject always excites a good deal of interest, and such articles can very well be utilized at times when first magnitude subjects are lacking.

By Dr. A. E. KENNELLY

PROFESSOR OF ELECTRICAL ENGINEERING, HARVARD UNIVERSITY

I AM a regular recipient of the *Science News Letter*, and read its columns with much interest. I sympathize heartily with the efforts that Science Service is making to act as an intermediary between the few thousand scientific investigators in this country and the hundreds of millions of English-reading laymen in this country and abroad, who desire to receive non-technical information of what is going on in the scientific world.

The task of such an intermediary journal is not an easy one. Articles of the right length, and suitable literary style, have to be prepared with reference to definite dates, upon specific technical topics. These technical topics, when emerging from the laboratory, naturally tend to be expressed in the technical code language of the scientific specialty to which they belong. In order to be acceptable to the public, they have to be decoded, and infused with a suitable amount of human interest. To carry out this program without sacrifice of the needed degree of ac-

curacy, and with the proper emphasis upon the important points in the communication, calls for special training in and knowledge of the fine art of popular scientific presentation. In my own opinion, Science Service deserves commendation for the measure of success it has attained.

There are two points in which it has seemed to me that Science Service articles might sometimes be improved.

(1) *Emphasis.* When a scientific communication is presented in suitable form for public appreciation, we all know how important it is that the emphasis should be laid in the right place, especially from the historic point of view. An accurate presentation may convey an inaccurate impression, by reason of laying emphasis on the wrong point. Only a specialist in any particular line of scientific work can correctly decide where the emphasis should be placed, and manuscripts should be referred to some junior specialist in that line, before publication, in order to ascertain that the emphasis has been correctly placed.

(2) *Metric System Retention.* The international quantitative language of science is in terms of the Metric System, which employs the meter, the liter and the gram. These terms should be used in scientific descriptions addressed to the public, partly because all persons interested in science must necessarily acquire some knowledge of the Metric System, and partly because the vast audience, in foreign countries, able to read English and appreciate Science Service literature, can only be satisfied if the simple metric terms are used. This does not mean, of course, that Science Service should attempt to lead metric reform, or endeavor to force the use of the Metric System upon those who may not desire to use it; but merely that the standard type of scientific communication should retain its international metric quality, with customary local national units inserted in parentheses, by way of explanation, only when considered necessary.

By Dr. CHARLES R. STOCKARD

PROFESSOR OF ANATOMY, CORNELL UNIVERSITY MEDICAL COLLEGE

REMARKS relating to medical discoveries have been made by both Dr. Flexner and Dr. Benedict. I fully agree with what they have said and would like to add that in presenting scientific news to the public it would be well to keep in mind that matter derived from different sciences should probably be presented in somewhat different ways. In the case of physics and chemistry, for example, there are no outside prejudices or superstitions concerned, whereas in presenting biological and medical studies one must realize that groups of people in almost every country —the anti-vivisectionists, anti-evolutionists and certain cults—are unreasonably prejudiced against animal experimentation. The existence of such attitudes makes it rather necessary that the reports of scientific developments in biology and medicine be presented in a more discreet and judicious manner than is necessary where these prejudices are not involved. In several of the states, as well as in Congress, there are at present active campaigns being carried on against animal experimentation. This threatens interference not only with the study of human and animal diseases but also might interfere in a general way with a number of biological and agricultural experiments involving the economic handling and breeding of animals. While Science Service is definitely opposed to propaganda, yet there might be valuable opportunities for properly emphasizing, in reports on biological and medical sciences, the result of new curative proceedings which bring out the great economic and humanitarian benefits that are only possible to obtain by very extensive experiments on animals.

In this way Science Service could help not only to bring needed material support to science but aid in preventing handicaps to its progress.

One important piece of medical study done during the last few years has not been reported by Science Service, and forms a most convenient illustration of results which might be used to counteract propaganda and thus aid science. Several years ago the Medical Research Council of England, supposedly interested mainly in human disease, undertook a very extensive experiment for the study and control of distemper in dogs. This investigation was carried out in a most successful way. As a result it is perfectly practical to immunize dogs against distemper, and this method of immunization may ultimately eliminate the most terrible disease among dogs. Without extensive experiments with dogs, such results could not have been accomplished.

Science Service could do very much, not only to acquaint the public, but also to interest the public in resisting prejudiced groups who are trying, through legislation, to interfere with scientific investigations of life and disease not only in man but in other animals as well.

By Dr. JOEL H. HILDEBRAND

PROFESSOR OF CHEMISTRY, UNIVERSITY OF CALIFORNIA

I WISH to suggest the desirability of making a more definite effort to set before the lay public not only the results, but the processes of scientific discovery. A mere cataloging of scientific achievements, while calculated to convince people of the material benefits of science, may, like the average school course in gen-

eral science, fail to give that appreciation of science as a spirit and method upon which its dignity and human value ultimately depend. It is surely important for the public to think of science as something more than a magic hat out of which can be drawn a miscellany of such products as stunning dyes, new medicines for new diseases and devices for increasing domestic noise. There is still a large majority of our population who regard science as a basis for technology rather than as an untried method of attack upon the depression.

To tell how a discovery was made is journalistically more difficult than to state the bare result, but I have no doubt that journalistic talent exists which is capable of it. The sports writers certainly do not content themselves with the score, but know how to describe the game; a polar expedition is written up so as to give the thrill of the quest and not merely an accurate description of the pole. I believe that a skilful journalist who has as much understanding of scientific matters as a competent sports writer has of his field could be trusted to write stories of discovery which would have as much popular appeal as did the lectures of Sir Humphrey Davy.

By Dr. T. WAYLAND VAUGHAN

DIRECTOR, SCRIPPS INSTITUTE OF OCEANOGRAPHY

Two problems have been mentioned. One is the interrelationship between the different agencies that report scientific information. I understand that that is not to be discussed this afternoon, although the matter has been broached. The other is the matter of getting scientific information before the public. We have so far talked more about the matter from the standpoint of the newspaper than from the standpoint of the scientific man. Therefore, I shall make a few remarks about what I think the attitude of the scientific man should be.

I have had a rather long experience with newspaper men from the time I was a youngster in the United States Geological Survey to the present time, and I have had most agreeable relations with them throughout.

I will tell one short story. In the summer of 1900 I was in Vicksburg, Mississippi. A reporter interviewed me and undertook to write an account of what I was doing there. In his account of the geological history of the area he made mistakes in the details, but in my opinion he got the major things right. They were that a visitor was in town, and that from the rocks in the vicinity of Vicksburg an interesting story could be extracted. The errors in detail were not of great significance.

We should be sympathetic toward the newspaper man, because, by helping him, he can produce about our work articles that are really excellent. If we take pains with the newspaper man, we can make him understand the most important things in our work. We should collaborate with him and bear our part of the responsibility in preparing reports for the public.

By Dr. F. P. KEPPEL

PRESIDENT OF THE CARNEGIE CORPORATION

I SPEAK neither as a man of science nor as one concerned with editorial or reportorial matters. I would like to say a word in favor of Science Service sticking to its present last, because I think we have not yet had an opportunity to see how tremendously important that is. I will take one aspect of the question that has not yet been touched upon. If you have occasion to look up an Englishman in the English "Who's Who," you will find among the things that seem really worthy of mention is his hobbies. In the American "Who's Who" a man's hobby is never mentioned, and the reason is, I think, that the English civilization regards the hobbies of people as important, not so much for their contribution to science as for the purpose of giving an idea of the human personality of the man in question. The charter of the Carnegie Corporation specifies that its purpose is not only for the advancement of knowledge but the diffusion of knowledge; so that all these matters touch us very closely.

We have been interested lately in things connected with adult education, and by the process of trial and error we have learned something about adult education in the United States. We have, as compared with other countries, paid very much more attention to vocational training as against non-vocational, but there is a great and growing interest on the part of individuals in the latter. I think I am correct in saying that the share of the natural sciences in non-vocational adult education is not nearly as high as it should be or as it might be made. We do not get very much education from the casual, rapid reading of the newspapers, but I hope that here and there somebody will take a more consistent interest in some particular field, and it is quite possible that Science Service may be able, in addition to furnishing material for the newspapers, to give to such people the service that it is equipped to give and to start them toward a more concentrated and useful work in some particular branch of science. I hope Science Service will stick to this particular field where it is alone and not enter into the field of what have been called the "unnatural sciences."

By Dr. RICHARD M. FIELD

ASSOCIATE PROFESSOR OF STRATIGRAPHY AND HISTORICAL GEOLOGY, PRINCETON UNIVERSITY

I HAVE listened to the discussion with a great deal of interest, although I imagine that the newspaper

men are already fairly well acquainted with a number of the problems that have been raised. I understand that the matter under discussion is the liaison between the press and science, which, in itself, presents certain difficulties. I feel very strongly that the newspapers, and especially certain newspapers, have done a great deal to increase the public interest in scientific matters, but more particularly to advertise the scientific man himself. As certain scientists seem to be better able to interest the press than others, it occurs to me that one of the most valuable contributions of Science Service is to see that the excellent work of the unusually modest or retiring members of our fraternity be brought to the attention of the public.

I would take exception, however, to one or two statements that have been made as to just what this meeting has been called for. The main idea, I feel, has been most aptly expressed by Dr. Merriam. As Dr. Merriam does not happen to be in the room at the present moment, he is relieved of the necessity of listening to my discussion of his remarks. Dr. Merriam emphasized the fundamentals of the general question before us in excellent fashion. His suggestions to both the gentlemen of the press and to the scientist were keen but tempered. He took up the question of sources of information, their quantity, and particularly their quality. As to the question of quality, Dr. Merriam's comments, in my estimation, are fully as applicable to Science Service as to the press. Dr. Merriam also suggested that a grave responsibility rests with the scientist himself; and that if he is not willing to take the time and the trouble to translate his work to the public, he can not expect that Science Service or the reporter can do it for him. Unfortunately, there are few scientific men who write in the way that most of us, deep down in our hearts, would like to.

And that leads me to a point that I hope is at least on the border of this discussion. I hope so, because I feel that it is so vital that the press will see its way clear to help. It certainly contains elements of human interest. In just what way may what the scientist considers to be facts regarding man's environment be kept clearly before the public in these momentous times? How may the scientist, as is his duty, help to divorce the purely emotional or political from the scientific treatment of a problem? In Washington there are a number of great scientific bureaus whose particular duty is to advise the public as well as the government in just such matters. I sincerely hope that in the necessity for economy Congress will not so cripple these bureaus that they will not be able to carry on properly their functions, which are as badly needed now as in 1918. I have the temerity to say that this matter should not be settled according to the total number of federal employees, but rather according to the value of each employee to his government in times of stress.

By Captain J. F. HELLWEG

U. S. NAVAL OBSERVATORY

IT is not always so important what you put in a paper as what you keep out. This idea is best illustrated by an incident about eighteen years ago. For about ten years we were interested in trying to devise a positive means so that a ship in a sea fight could distinguish her own shots. After working some years to develop this, you can imagine our surprise when we saw the whole thing in the newspapers one morning.

There are people in this country who are paid to get information which might be of value to countries on the other side of the ocean.

Another feature. They have in all the other countries—I don't know exactly the title—but it is a law for the protection of the realm. Any information, patents, mechanisms, weapons or material which in even the most remote way could affect the safety of the realm is not allowed to be published. We are not so careful. As soon as we say or do anything, the world knows it through the press. Frequently a device intended for one purpose can be very readily adapted to another. In the early part of the war, some one came to Washington with an idea he thought was wonderful. It was useless to us for its designed purpose, but we used it very successfully in the North Sea to keep the German fleet from coming out. It is very important not to tell everything. It is far more difficult to decide what not to publish than it is to decide what to publish.

By Dr. KNIGHT DUNLAP

PROFESSOR OF EXPERIMENTAL PSYCHOLOGY, THE JOHNS HOPKINS UNIVERSITY

I HAVE listened with interest to a number of very excellent ideas that have been expressed, but I doubt whether many of those ideas are much news to Science Service. There have been some suggestions made which I strongly suspect would be revised if the makers of the suggestions would familiarize themselves with the actual problems and difficulties which Science Service has and the attempts they are making to surmount them. It seems to me the position taken by almost everybody is that Science Service has merely to find out what to do and then go ahead and do it. I have had enough informal acquaintance with Science Service to find out that is not the case. The difficulties are not so easily surmounted. I think we will have to agree with several speakers that Science

Service has made very striking progress towards the surmounting of those difficulties.

The difficulty of getting authentication for reports is no new thing to Mr. Davis or any other member of the Science Service board. I happen to know the means they use to surmount that difficulty.

The fact that Science Service has made a distinct success is perhaps not so easily recognized, unless we consider the conditions of the publication of scientific material before Science Service entered the field. We have been told there are other avenues of publication. What would happen to those avenues if Science Service ceased to be a factor in the field? Well, we know what would happen. We know what the difficulties were before Science Service became active. We agree with those who praise the newspaper men. I agree, in fact, with almost everybody. I have had experience with newspaper men. There used to be great difficulty in getting newspaper men to take scientific results seriously. That trouble is largely past because of Science Service. Science Service is struggling with very definite difficulties, but I think it does pretty well in keeping its material in good shape.

By Dr. WILLIAM H. HOWELL

VICE-PRESIDENT AND CHAIRMAN OF THE EXECUTIVE COMMITTEE OF SCIENCE SERVICE

IT is not possible for me to summarize in any adequate way the remarks made by the various speakers this afternoon, but it is a pleasure to express on the part of the Trustees of Science Service our appreciation of the helpful and friendly suggestions that have been offered from so many different points of view. All the speakers have recognized the difficulties inherent in the effort to popularize science, and at the same time they have not failed to emphasize the importance of the undertaking.

The value, if not the necessity, of providing for the instruction of the public in the progress of science is evident from two considerations. In the first place, it is vitally important for the support of scientific work. In the olden days the scientist obtained his necessary financial assistance from individual patrons, but he paid for it often times, as one may gather from the fulsome dedications of their books, by an obsequious servility that would not be acceptable under present conditions. In these days with our large and expensive undertakings the patron to whom we must apply for aid is the general public, and it follows that we must keep this public informed and interested if we hope to obtain the continued and increasing support that is necessary for our large projects.

In the second place, it is a part of the larger purposes of science to make its discoveries contribute to the advancement of civilization. While the individual worker may be driven by curiosity or a personal desire for fame or gain, the underlying aim of science as a whole is to bring benefits to humanity on both the material and the spiritual side. The material advantages are evident enough, but the spiritual gains are no less important. It is not necessary to labor the point. Only the truth can free us from the hampering prejudices and superstitions of life, and the discovery of truth is the great end and aim of scientific work. Whatever it attains should be passed over as promptly as possible to the general public to help them in the difficult task of regulating their individual and communal lives.

On the practical side, one great difficulty in popularizing science lies in the art of translating its technical terminology into the vernacular of the people in such a way as to present the story both attractively and accurately. All of us who have attempted to do it know its difficulties and dangers. One must avoid, on the one hand, the dry-as-dust language of the pedant, and, on the other, that kind of over-statement and false appeal to the emotions which in the end defeats its own purpose and of which we have so many tiresome examples in radio advertising and newspaper reporting. The art of popularizing science properly is, no doubt, a special gift. When we of the older generation think of it our minds go back to the beautiful essays of Huxley and Tyndall. We can not of course keep Huxleys and Tyndalls on our staff, but they may serve as examples, and the lucidity and charm of their style furnish an ideal to be studied and imitated. In the course of time, by the method of trial and error we may hope to discover and develop a group of writers with special talents for this kind of exposition.

Permit me to thank you again for your willingness to participate in this conference and for the many helpful criticisms and suggestions that we have derived from your discussions.

OBITUARY

JOHN WALTER GREGORY

"DROWNED by the capsizing of his canoe on the Urubamba." Thus has passed Dr. J. W. Gregory, at the age of sixty-eight, continuing to the last his brilliant career of tireless exploration. British geology has lost one of its most intrepid leaders, and his fellow scientists the world over will miss his stimulating thought.