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SCIENCE AND THE NATION[1]

By Sir WILLIAM BRAGG

MANY events conspire to make the past year notable in the history of our society. Reference has been made to the majority of them in the Annual Report of Council, usefully supplemented by the Notes and Records which we continue to owe to our past treasurer, Sir Henry Lyons. I do not propose to speak of them in detail, but on this occasion it does seem fitting to give further attention to one or two general matters of lasting interest.

One of these is personal. Fellows will have noted the long list of those whom we have lost, and the great names which the list contains. I have felt as I have been reading it that I have turned over the last leaves of a chapter that stands by itself. The present generation is quick to honor the names of J. J. Thomson and Oliver Lodge, but they can not remember, as we older men can, the brilliant years when these men and their contemporaries were writing the chapter's first pages. What they wrote was eagerly read, their lectures were rapt attention; they were the pioneers, and the scientists of that time, nearly half a century ago, streamed after them. All that is now a memory. The years have slipped away since their work was done, and we now look back on it and see it as a separate entity, a noble event in the history of science, and of British science in particular.

There is no vestige of sadness in such a retrospect, nor any trace of feeling that our pride must be founded only on what has passed. I am sure that all those who like myself can recall the long years, and compare those that have gone by with those that are still ours, will say happily and proudly that our young men of to-day are maintaining in full force the tradition that they have received. They are writing a new chapter;

[1] Address of the president of the Royal Society at the Anniversary Meeting, November 30, 1940.

and it is a chapter of a novel importance because as they extend our record of the facts of nature they find themselves compelled at the same time to consider a new problem, the relation of those facts to society and to the government of nations. Let me express my admiration of the willingness, vigor and ability with which the newer generation gets to work.

This same novelty is enlarging the range of work of our society and is a second matter to which we are compelled to give serious attention. Our fellows have constantly given their services to public interests; it has often been pointed out that they are to be found in association with almost every department of government. But this year new moves have been made which may, and I hope will, lead to developments of the highest importance. The Report contains a notice of the recent formation of a Scientific Advisory Committee, over which Lord Hankey presides, with a reference which in effect directs it to consider the advances of science in their relation to national welfare. The committee reports to the cabinet through its chairman. A committee of similar nature but lesser scope was set up a few months ago to consider the scientific aspects of the food policy of the government: it consists of well-known authorities on nutrition, agriculture and economy, with myself as chairman. This committee reports to Lord Privy Seal, and so to the Cabinet Food Policy Committee over which Lord Privy Seal presides. The significant feature of these committees is their close and direct association with the cabinet, the central body that governs our nation. Hitherto scientists have been appointed man by man to various government departments so that they might act as useful items in departmental machinery. The new committees are not parts of any executive body and have no executive power of their own. They exist to make recommendations, which must of course be practical and take full account of difficulties of execution. But they are not hampered by traditions, nor by set habits; they have time and freedom to consider the whole field of scientific knowledge and its possible influence on practice. The Scientific Advisory Committee, the more important of the two, is particularly well fitted to watch all occasions and opportunities for the employment of science in the service of the nation, and also for the continuous encouragement of that employment. The president of the society and the two principal secretaries are in close touch with every branch of science; through the fellows of the society which they serve they have a unique view of scientific progress. The three secretaries of the principal research councils of the government, dealing with industry, agriculture and health, are in close touch with the chief national activities.

Thus a great opportunity is opened after long expectation; and the Royal Society is largely responsible for the development of that opportunity. We hope that no hindrances from without may interfere with the society's task, and we are determined that there shall be no lack of energy from within.

We remember that it is science itself, not scientists, that we are trying to lift to the high places. In that respect our movement is not selfish. We do not claim that scientists shall be entrusted with authority because they are scientists: we do claim that authority shall be exercised in the light of a knowledge which grows continuously, and with continual effect on politics, on industry and on thought itself. If at present the only way to bring this knowledge into use is to treat scientists as consultants, let us take that way. But we shall be taking the better way if in all ranks of the state, and especially in those that have authority and set an example, we can arouse a general appreciation of the position, and a constant understanding watchfulness on the increase of knowledge and the uses that are made of it and can be made. It can not be said that the general aspect of the nation towards the increase of knowledge is satisfactory. Science has become an integral part of our educational system, yet the changes that have been made are often ridiculously like the casting of sacrifices to following wolves. Science is not a devouring monster, but a means of service; it is a knowledge, gained by an irresistible tendency of man to examine his surroundings. It may be rightly or wrongly used. There is a prime danger if those who are in the position to use it rightly shut their eyes to its presence and its power, like an army which relies on bows and arrows when its enemies know how to use machine guns.

It is not universally nor even sufficiently understood how important natural knowledge has become. It is true that in a vague way the nation is brought by the happenings of war to guess at the meaning of scientific research in every kind of enterprise. But still it would be difficult for most people to grasp the significance, much less the meaning of the description of a fact like this: that the R.A.F. could not carry out its operations without the knowledge resulting from the studies of cathode-rays and electrons made by our physicists, which is equivalent to saying that by this time we might well have lost the war. Similar cases of cause and consequence could be quoted in numbers; they happen to be found more readily in relation to the sciences that deal with inorganic materials than those that deal with organic processes, and the military demand for physicists has been great because they are wanted to put physical discoveries into practice. But this discrimination is only accidental and temporary, and in fact the whole range of science is equally concerned.

Since experimental science has assumed such a commanding influence on all our affairs, so that we run the risk of great perils if we take no account of it, and leave its uses to others, let us say less well disposed than ourselves, and, on the other hand, have opportunities of great benefit if we use it rightly, it becomes a first duty to direct our steps accordingly. Just as in former times schools and colleges were founded to train men for the service of church and state, in ways which were appropriate to that high end, so now we have to see to it that the men are produced by our educational systems who can appreciate and act up to a new state of affairs. This can be done without jettisoning any of the fine instruction which has been a proud feature of our older systems.

I think that this is not essentially a matter of the rearrangement of school time tables, or the building of scientific laboratories, though such tactical methods must have their due consideration. This is a personal matter, as has been the case with every great human movement. We have not to force the use of new tools, but to encourage and develop a new appreciation and a new attitude. Our best method, as ever before, lies in our own actions. If we, in the continually increasing contacts of scientists with public affairs, can show that we have something of great value to contribute, and that we give it freely, placing our individual interests below those of a greater purpose; if we try to understand the motives and principles of those whom we meet who may not see our vision just as we may fail to appreciate theirs, then by so doing we have the best chance of bringing about the changes that we desire. It is the personal contact of the scientist, especially with those who are charged with duties to the nation, that is the moving force. That is where these new associations of science with government may mean so much, and shall mean it, if our devotion can achieve its purpose.

This afternoon I leave the presidential chair. I have deeply appreciated the honor that has been paid to me by my election to it, and I want to thank with all my heart the officers of the society, the members of council and the permanent officials who have helped me to fulfil its duties.

THE ROYAL SOCIETY[1]

By Dr. L. J. HENDERSON

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THE purpose of the "Record of the Royal Society" is "to provide a compendium of information, largely historical, regarding the rise and progress, the organization and work of the Royal Society." This purpose is admirably achieved in the present revised and enlarged fourth edition of the work. The book comprises a brief history of the society, notes on the charters and statutes, full information about the benefactors of the society, its funds, research professorships, fellowships and studentships, its library, portraits, busts and other property, its committees, publications and relations with the government. In appendices the various charters and statutes of the society are printed and also complete lists of patrons and officers, of medalists and lecturers and finally of fellows arranged both chronologically and alphabetically. Accordingly, this is both a book of reference and an account, brief, but documented as few histories can be documented, of the formation, the development and the functions of a national academy of science.

The Royal Society of London for the Promotion of Natural Knowledge is in many respects the most interesting of all such academies. It is the oldest surviving academy that has had a continuous existence. In the second half of the seventeenth century it was one of three which accomplished the first effective organization of scientific work and of scientific workers, and to-day, though its activities are different from its early activities, they are still as important as ever to the sciences and probably much more important—at least directly—to the state and to society at large.

It is convenient to divide the history of the Royal Society into three periods: the seventeenth century, the next century and a half, and lastly the time from the middle of the nineteenth century to the present day. On the whole, the composition of the society, its activities and its functions have varied widely in these three periods. The first and third are the times of vigorous activity.

The present "Record" begins with the statement that "the foundation of the Royal Society was one of the earliest practical fruits of the philosophical labours of Francis Bacon," and so it was in a measure that is to-day hardly appreciated. Sprat may be cited in support of this judgment. He wrote in his "History of the Royal Society" in 1667:[2]

[1] "The Record of the Royal Society of London for the Promotion of Natural Knowledge." Fourth edition, London, printed for the Royal Society by Morrison and Gibb, Ltd., Edinburgh. 1940. Price, 21/–.

[2] Tho. Sprat, "The History of the Royal Society of London, For the Improving of Natural Knowledge," London, 1667, pp. 35–36.