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65.        **THE ORGANISATION OF MEDICAL RESEARCH  
              IN GREAT BRITAIN (\*)**

Professor Giacomello, Your Excellency,

Ladies and Gentlemen,

I would first like to express to you, Professor Giacomello, my great gratitude for having asked me here to speak to you this afternoon. I did not come to Rome to speak. I came, as so many people have done, to learn. Your Institute is world-famous. Its publications and its distinguished work have been known to me for a long time; and, as a scientist, I was anxious to visit the Institute and see the work in progress. But I had another reason. It is now almost twelve years since I myself worked in a laboratory. I have become an administrator; and I knew from reports that had reached me that you had devised methods of organisation within your Institute that were original and far-sighted. It was therefore primarily to learn of these that I came here.

These being my intentions, I could hardly refuse Professor Chain when he asked me if, while I was with you, I would talk about the organisation of medical research in Great Britain. I had not realised at the time, however, that it would involve me in addressing such a large and distinguished audience. Nevertheless I shall be very glad to tell you what we are doing in my country, in the hope that it may be of interest to you in relation to your own problems.

When one looks at the organisation of research in different countries, I think that the overriding impression is how much the organisations have in common, despite their different countries showing wide differences in social structure and cultural history. In 1954 I was chairman of an international committee in which eighteen nations came together to discuss the support of medical research. Although we had suspected that we should have many common interests, I think it was a surprise to us to find how similar were our problems and how our organisations were all expressing the same basic principles. I think therefore that

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it might be helpful if we began by considering those principles that are common to all scientific organisations, in any country and in any age, because they are a response to the conditions by which scientific knowledge is gained.

Let us go right back to the very beginning of Western scientific knowledge, to the days when our profession began. Let us first ask ourselves what is a profession, and what are its particular characteristics. Now it is at once apparent that the idea of a profession has no meaning apart from society. Until men became gathered in communities they could not become specialised in function. As a consequence of this specialisation in function a division of labour grew up, and men themselves became specialised as individuals and as teams. In consequence the power of the community was enormously increased. But these specialisations were not all of the same kind, and among them was a group which stood out because of certain particular characteristics. It is this group which public opinion distinguished as the professions, and the criteria of distinction are two special characteristics. Each of these activities is concerned with a service which society regards as of vital importance to itself. Each is dependent not upon general opinion, but upon the judgment of a single individual. It is these characteristics that have determined professional organisation.

Because the skill which a profession gives is vital to the individual, competence is not enough. In medicine, no patient will be satisfied unless he believes that he has had the best available. In consequence the standard of endeavour expected of professional men is that of excellence rather than mere competence. It is this that leads them to regard the extension of their knowledge as a duty, and has made research an essential feature of professional activity. The second characteristic of professional work is that it depends upon individual judgment. It cannot therefore be directed by mass opinion; it is for this reason that society has had to recognise from the very beginning that in professional matters it must allow intellectual independence for men in the professions. The ideas of research and the privilege of intellectual independence required for creative work were thus embedded in the idea of professional activity from the outset. When, therefore, the schools of professional training became gathered together into the *studium generale* which evolved into the university, they took with them these two characteristics, so that they in turn pursued the ideals of research and expressed in the concept of academic freedom the necessary tradition of intellectual independence.

It is on these foundations, these conditions, that all countries have had to build their organisation. These are the conditions that organ-

isation has to satisfy if it is to probe successfully the secrets of nature. And it was with two organisations fulfilling these conditions — the profession and the university — that we entered the age of modern science; and it is these same conditions that any further organisations we construct for supporting research will, in their turn, have to express.

At the beginning of the present century the realisation of the importance of research for the country was confined to a few very farsighted men. Now the appreciation is widespread, and the danger is more that too much may be expected of research than that too little attention will be paid to it. In my own country, at the critical time, it was our good fortune to have three outstanding men in key positions at the centre of affairs. The first was Dr. Christopher Addison, later Lord Addison. Before he entered politics he was the Dean of St. Bartholomew's Medical School in London, and he was a scientist in his own right. He was therefore well equipped to understand the trends of the new age. Associated with him was Lord Haldane of Clone, who was a philosopher of standing. And the third was one of the most outstanding civil servants that Great Britain has ever had — Sir Robert Maurant. Under the guidance of these three men the United Kingdom devised its research organisation about the years 1910 to 1917; and if I trace the history of my own organisation, it may be illuminating.

The Medical Research Council of Great Britain arose as a result of very utilitarian considerations. In 1911, Health insurance was introduced into the United Kingdom for the first time, and in connexion with this it was decided, almost as an afterthought, that it was desirable that some research should be done in association with this. That was in 1911, and in 1913 the Medical Research Committee was formed. At that time there was no Ministry of Health, so that the Committee was made responsible to the body administering National Insurance.

At the very outset of their business this Committee found themselves faced with a most important decision on principle. It was soon evident that within the Committee there were two views as to the function required. One party maintained that the function of the Committee was to deal with those things that were costing the country most; to confine the spending of available money to research on such subjects as tuberculosis, cancer and typhoid. The other group, led by Lord Addison, resisted this view. Their contention was that in research the shortest distance between two points was not necessarily a straight line; that in order to be effective the Committee must be free to support good research in any direction that appeared relevant and not confine themselves narrowly to a few selected aims. Fortunately for the future development of British science, the second view prevailed. As a consequence the new

Committee, from the outset, was recognised by research workers and by the universities and professions as understanding the conditions by which new knowledge is won. It was therefore regarded as part of the professional and academic world and not as an external organisation imposed upon this. Close association between the central research committee and the universities and between this committee and professional associations followed inevitably, and has remained the basis of its policy ever since.

Before, however, the new Committee could put any of its plans into effect, the first World War broke out, and every resource was required. In a very short time the Medical Research Committee, that was intended to work solely on strictly medical problems, was working for every department of government. Nobody had hitherto suspected the widespread need for medical and biological research that would be disclosed by the intensive conditions of modern war. There were new problems of medicine in the home country, due to movements of population. There were problems of tropical medicine overseas which people had not suspected until they came to move large bodies of troops. There were problems of new toxic substances in munition factories, and those that grew out of studies of fatigue and the psychology of people at work. In another category were the problems arising out of the need to increase efficiency, in particular those connected with the efficiency of men in aeroplanes and those in submarines. These and many other problems were brought to the Medical Research Committee, and within two years of the outbreak of war it was acting as a research department for many Services and government departments. The realisation of the widespread need for medical and biological research was singularly opportune.

In 1917, men began to think of the problem that would face them after the war finished; and the British government appointed a minister to examine the problems of reconstruction. This minister was Lord Addison. The task that he was given was to create a Ministry of Health; and in this connexion it was assumed by everybody that he would take the old Medical Research Committee and incorporate it within the Ministry as the research branch of this department. But Addison was a scientist first and foremost. He refused to do this, and gave the following reasons. First, he was able to point to the experience of the war and show how widely medical and biological research was needed, and to deduce from this that the research organisation concerned with this field should not be confined to any single executive department of government but should be available to all. A second reason he gave — and it was here that you could see the scientist speaking — was that research, to be effective, must not be pressed by day-to-day problems

requiring urgent decisions. The third reason he put forward, and which was received with great astonishment, was that executive policy is necessarily formed on the basis of existing knowledge, that research may at any time discover new knowledge which shows that policy is mistaken, and that therefore research must be separate from those who have the responsibility for executive policy. On the basis of these three reasons he drew the inescapable deduction that the central research organisation should be independent of various different executive ministries of government.

It was for this reason that the new Medical Research Council, which replaced the Medical Research Committee, was established not in the Ministry of Health, but under a Minister without Portfolio, the Lord President of the Council. The Lord President of the Council had a committee of ministers, each of whose departments were interested in medical research, to assist him. It was to this committee that the Medical Research Council reported, and so became integrated into government.

But Addison was not satisfied that this general structure was enough. He insisted also on building into the constitution of the Medical Research Council further measures to preserve the independence of research. It was agreed that the Council should consist of twelve members, nine scientists and three non-scientists. The three non-scientists were appointed by government directly; but the nine scientists could only be appointed after consultation with the Medical Research Council themselves and the President of the Royal Society for the time being. Further, the new Council appointed its own Chairman and its own Secretary; and it was also given its own budget. Those are the steps by which the organisation for medical and biological research in Great Britain came into existence. Necessarily they reflect the social outlook and traditions of the country in which they evolved, but in principle they are not unique and the subsequent development of this organisation has been on lines that have been followed, or are being followed, by many countries.

If one examines the development of any central research organisation or medical research council, one can see that it passes through four stages. At the beginning it is conceived as an instrument to deal with particular problems that have been identified as pressing public needs. But it is soon found that available knowledge is not usually sufficient to answer all these problems. Sooner or later, therefore, the central organisation is driven to employ its own staff of investigators to fill in the gaps of knowledge that it has identified. With increasing experience it then enters on the third stage. It begins to be appreciated more and more how often work which seemed remote from practical

need is found, sooner rather than later, to be of profound practical importance. The research council thus comes to attempt, with increasingly conscious purpose, to forecast the developments of research and to invest in a longer and longer-term policy in the proposals that are put to it. In effect its policy becomes to support good work anywhere — in the universities, in the profession or in its own institutions — that promises, however remotely, to be relevant to its interests. The fourth stage in its development is forced upon the central organisation by the increasingly insistent public demand for more and more knowledge, until it begins to be recognised that if a research council is to provide the assistance expected of it to its society then it must concern itself with the whole of research in a country and not simply the research carried out in the institutions which it directly administers. It must be free to support good work wherever it be found, in the universities, in hospitals, in professional associations and in its own institutions; for it is only in this way that the necessary coverage can be obtained.

The modern role of a research council has now clarified. It is twofold. On the one hand it has to provide advice to government, and to this end to pursue a policy that ensures that — as much as is humanly possible — the research resources in the country cover both in quantity and variety the width of new knowledge required. On the other hand it has to promote research, and to do this it has to give not only financial support but to ensure that the conditions for research, intellectual freedom and encouragement of initiative, are preserved for individual research workers.

In these two tasks some people may see a dilemma; they are difficult to reconcile. Society demands knowledge, and demands it insistently because there are practical needs which require its application. Research, on the other hand, requires freedom to follow its inspiration, because that is the most effective way in which it can work. There is a dilemma here, and it was put very cogently recently by Sir Eric Ashby in an article he wrote in the American publication « *Daedalus* ». He pointed out that the essence of this conflict — as some people call it — between the administrator and the research worker is essentially one of their different ideas of time. To the administrator time must be a most, if not the most, important dimension. Something has to be done and something has to be decided. To the research worker time cannot be a dimension. He must know the truth. Both are right, but the question is, can organisation solve the dilemma posed by the need to bring these two ideas into collaboration. I think it can. It is largely a matter of scale of operation. If the central research council has only a few institutes at its disposal, and it tries with its own resources to supply

all the knowledge required, then, with the big demand for knowledge, it is driven to a policy of directing what research its workers shall interest themselves in. All experience shows that this is a policy that leads to sterility. If on the other hand the research council operates on a large scale, if it works in partnership with the widespread universities and professional life, whether this be in hospitals or in practice, and if it spreads its support widely so as to ensure that somewhere in the country there are men whose spontaneous interests cover all aspects of the subject, then it is ensured that the resources are available for it to call on as the need arises without imposing direction on individuals. This is the real significance of what I have called the fourth stage in the evolution of a research council. The time is long past when any government could look to its central research organisation to provide all the knowledge from its own resources. It must now expect this organisation to view its field of work over the nation as a whole and to have as a major responsibility the devising of a policy to see that all requisite branches of knowledge in its field are represented and, to the best of its ability, adequately supported. Thereby it can hope to produce the new knowledge required. It will thus solve one part of its task. But there remains the other part, the integration of new knowledge into public policy.

I referred previously to the decision that separated the British Medical Research Council from the executive departments of government interested in the results of its work. When this doctrine, originally put forward by Lord Haldane, was first presented, it was regarded as being very strange, if not even improper. In my country, however, it is now fully accepted, not only by research workers but by the public, government, and administrative departments. It is accepted by the public because it assures them of an independent disinterested opinion on subjects that are increasingly becoming of vital importance to everyone. To the government and to the administrative departments it is welcome for a similar reason. May I give you one or two examples?

In 1955 there was considerable concern about hazards to people from fall-out from atomic weapons. This matter was keenly debated in Parliament and there was considerable disagreement between government and opposition on the subject. Sir Winston Churchill was Prime Minister at that time, and at the end he said that he would refer this matter to the Medical Research Council for an independent opinion and their report would be submitted directly to Parliament. This proposal was accepted immediately as adequate, and in due course the report was submitted to Parliament and accepted by all as authoritative. A little time later there was an accident at one of our nuclear power plants —

Windscale — and it was widely feared that the radioisotopes liberated had been distributed in dangerous concentration over a considerable part of the country. The public concern was too acute to be satisfied by a local enquiry, and again Parliament asked the Medical Research Council for an independent report on the whole matter. Similar problems are coming to the Council repeatedly. We are repeatedly being approached by the Trade Unions to investigate illnesses which they suspect are attributable to occupation. We are asked by the pharmaceutical industry to carry out independent trials to assess the value of drugs. The military Services frequently request our help. All these requests stem essentially from our independence, which has enabled us to build up a reputation for being disinterested. I think therefore that one can say that the separation of research from the executive departments interested in its results — although at first sight an anomalous thing to do — is actually a wise provision in modern society.

I would not have you think, however, that I believe that executive departments of government should not undertake investigations of any kind. On the contrary, I believe the operational research within their own field, and observational research such as is required to keep records of epidemics and so on, are things which only they can do. These are investigations which require not only the skill of the scientist but the experience of a practitioner. And men with the combination of these skills are found either in practice or in the medical services of the armed forces, or in the professional branches of executive departments of government. The contributions of these men to the total body of knowledge in any field are indispensable and everything should be done to encourage them.

This is the pattern that has emerged in the United Kingdom: a central research organisation, independent of executive departments of government, which advises the government on the one hand and accepts on the other as its responsibility the support of research anywhere in the country, wherever this is being done. This pattern has been followed in other fields. The British Agricultural Research Council and Department of Scientific and Industrial Research are constructed in this way. Our Nature Conservancy and our Atomic Energy Authority approximate to this pattern. In other countries and in the British Commonwealth it has been generally followed.

May I now say a few words about how the British Medical Research Council operates and how it organises its support for research? We use three different types of instrument. The first is the grant to the individual worker who is not employed by us but who submits a programme for a research project for which, if he is successful in his application,

he will receive the appropriate money to have technical assistance, expenses, and in some cases scientific assistance. The next instrument is what we call the Research Group, and it is used almost exclusively in relation to universities. Essentially it consists of giving a block grant to a university to allow it to expand a department that is already created faster than it would be able to do from its own resources. The test of eligibility for receiving such a grant and being able to set up a Research Group to augment a university department is, however, that the subject in question be not, in the judgment of the Research Council, sufficiently developed in the country, and that it be in the national interest its development. The third type of instrument is one that I think is usually regarded as characteristic of British organisation. Like most of the things that are characteristic in Great Britain it arose entirely by accident. This is what we call a Research Unit. A Research Unit is a team of men who are employed by us and whose director is responsible to the Council itself for his policy. These teams vary greatly in size; some contain only six or so scientists, some may contain thirty or forty. They arose in this way: just before the first World War, the old Medical Research Committee had acquired an institute, and in it they set up several departments. When the war broke out the building was requisitioned for a military hospital and the Committee had to find other homes for these departments. They were, therefore, distributed between different universities. At the end of the war some of them were brought back into the original institute and created the National Institute for Medical Research. But some others were so evidently well placed in the universities where they had been situated that they were allowed to remain and were called Research Units. This accident proved such a success that we were urged to create many more of these units. At the present time the Council has 76 and most of these are placed within universities. These are the instruments that we use, and it will be seen how closely they are integrated into the university pattern and the professional pattern. I have referred to units being in universities; to grants being given to workers in universities. I am sure, however, that you will understand that in doing so I was including the teaching hospitals associated with the universities in which so much research in the clinical field is now done.

Finally, may I turn to a rather different point? We have discussed the organisation for winning new knowledge and the relations with executive departments of government for bringing such new knowledge to bear on public policy. I have pointed out that in the sister fields of agricultural research, industrial research and so on, a similar pattern for winning knowledge and relating it to the practical organisation most

concerned has evolved. But what about scientific policy at a higher level? What about policy that determines the balance of effort between the different fields of research which a country now requires? This is a problem of the first importance and it is one which I do not think any country has yet finally solved. In my opinion, when we come to the level of general scientific policy the considerations are different. At the level of the individual research council we were concerned with one field of knowledge and we may properly claim that the predominant consideration is a professional one. But when one reaches the level of general scientific policy, more than science is required. It is not possible on purely scientific grounds to weigh the advantages of space research on the one hand against the advantages of cancer research on the other. But it is possible to weigh these on political grounds, on the assessment of which of the two the country needs most. At this level, therefore, political and administrative considerations become expert matters in their own right. They are an essential, some would say the dominant, consideration. But they are not the entire consideration, and it would be disastrous if it were ever thought that they were. A very eminent medical administrator once made a statement to the effect that the recognition of a human need is no evidence that research is feasible; the assessment of feasibility and opportunity is an expert matter, and without it administration can hardly be effective. At the level of general scientific policy, the scientist has the responsibility of seeing that the consequences of accepting any proposal for research are fully understood, of advising on the feasibility of promoting such research successfully, and of ensuring that the cost of such research — not merely in finance but in terms of the available resources of intellectual power in the country — is fully realised. It is through the partnership of the political and administrative experts with the scientists that policy at this level must be solved.

I have now completed the survey of medical research organisation as it exists and as it appears to be evolving in my own country. As I said at the outset, it necessarily reflects the traditions and structure of British society; but it appeared to me that when I was speaking I could see responses on the faces of people in my audience which indicated that I was talking to them about problems and experiences with which they were familiar. That has been my experience in many places, and it is not surprising that it was. We are all scientists, and as such have only one problem — the understanding of nature. It is only natural, therefore, that in many different countries we should all have discovered the same basic principles in approaching our task, and that although we tend to apply these in the idiom of our own society, we are all part of the same common purpose.