Travel Grants

Microcirculation, 4th European conf., 26 June to 2 July, Cambridge, England. Six NIH grants; air travel from U.S. to London, 7-day per diem allowance. Requirements: five copies of abstract, up to 450 words, of paper to be presented, brief curriculum vitae; maximum age, 35. Deadline: *1 January*. (H. J. Berman, Department of Biology, Boston University, Boston, Mass. 02215)

Psychology, 18th international congress, 1–7 August, Moscow. NSF and NIMH grants; transporation help for participants. Deadline: *15 February*. (Travel Awards Committee, American Psychological Association, 1200 17th Street, N.W., Washington, D.C. 20036)

Radiation Research, 3rd international congress, 26 June to 2 July, Cortina d'Ampezzo, Italy. NAS–NRC, and Radiation Research Society grants; partial travel support for U.S. participants. Deadline: *1 February*. (Ad Hoc Committee on Travel Grants, NAS, 2101 Constitution Avenue, N.W., Washington, D.C. 20418)

Scientists in the News

H. W. Thompson, president of the International Council of Scientific Unions since 1963, was named foreign secretary of the Royal Society 30 November, when P. M. S. Blackett was chosen president (see p. 1437). Thompson, whose major contribution is the application of infrared and Raman spectroscopy to chemical problems, is at the Physical Chemistry Laboratory, Oxford. Also on 30 November, the Royal Society chose **M. J. Lighthill** of Imperial College, London, as physical secretary. A student of fluid dynamics, Lighthill taught at the University of Manchester before heading the Royal Aircraft Establishment, Farnborough, in 1959–64. The Royal Society re-elected the following officers: treasurer, **Lord Fleck**, former president of Imperial Chemical Industries; biological secretary, **A. A. Miles** of the University of London, and director of Lister Institute.

Richard G. Bader, program director in oceanography at the National Science Foundation, has been appointed professor and chairman of oceanography at the University of Hawaii.

Gerd Burkhardt, director of the Institute of Theoretical Physics at the Higher Technical School, Hanover, Germany, has been appointed director of the department of advancement of science at UNESCO.

C. N. Yang, physics professor at Princeton's Institute for Advanced Study and co-winner, in 1957, of the Nobel Prize for physics, has been appointed distinguished professor of physics at the State University of New York, Stony Brook. He is to assume the Albert Einstein chair of science as of 1 April. The university also has announced the appointment of Maurice Goldhaber as adjunct professor of physics. He is director of Brookhaven National Laboratory.

J. D. J. Hofmeyr, head of the department of genetics at the University of Pretoria, has received the Havenga prize in biology from the South African Academy of Arts and Sciences.

Garman Harbottle, chemist at Brookhaven National Laboratory, has taken a 2-year leave of absence to serve as director of the division of research and laboratories at the International Atomic Energy Agency, Vienna.

Mead LeRoy Jensen, formerly professor and director of graduate studies in the geology department, Yale University, has become director of the recently established isotope geology laboratory at the University of Utah's school of mines and mineral industries.

REPORT FROM EUROPE

Blackett Chosen President of Royal Society

London. More than the desire to honor a distinguished physicist influenced the election, announced 30 November, of Patrick Maynard Stuart Blackett, 68, as president of the Royal Society for a term ending in 1970.

The Royal Society hopes to build on measures taken during the term of the retiring president, Lord Florey, to increase its political effectiveness. Behind this hope is the fear that Britain's machinery for making decisions about science and technology may not be strong enough for the tasks ahead.

In Britain, which, like the United States, spends nearly 3 percent of its gross national product on research and development, there is much discussion of an impending period of hard choices; such talk is typified by Lord Bowden's speech in September at the European Institute of Business Administration at Fontainebleau (*New Scientist*, 30 September and 7 October). Soon, it is felt, the exponential growth curves of research budgets or numbers of scientists will begin to level off in Britain. There is widespread worry here, as in the United States, that the choices which are looming will not be made rationally or in the best interests either of science or of the nation.

In Britain there is no top-level team of scientific advisers. Instead, the machinery for making government policy decisions about advancing science and technology appears, if anything, looser than it was before the reshuffling of British science and technology agencies recommended in the Trend report of 1963 and largely adopted by the present Labour government.

Instead of the single, if powerless, scientific advisory council which existed from the late 1940's, there are now two councils, one (of which Blackett has been permanent vice-chairman) to advise the new ministry of technology and another to advise the department of education and science. The two new

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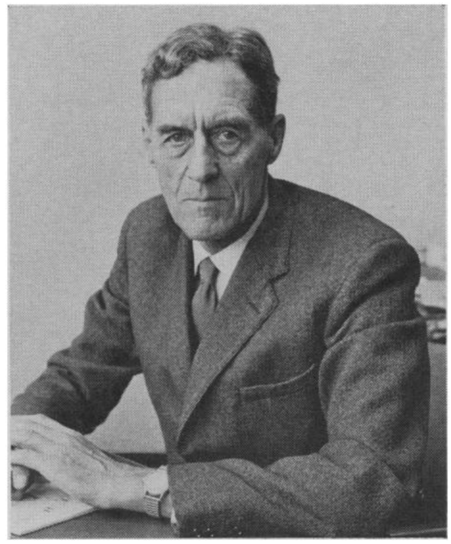
councils have more direct control over the allocation of funds than their predecessor, but the purview of each is narrower.

The old advisory council was first headed by Sir Henry Tizard, who, upon returning to real influence after World War II, headed councils to advance civilian and military research, although atomic energy was held separate under the prime minister's direct influence. Perhaps because of Tizard's broad role, and because of the British tendency to govern through a web of informal contacts, it was not thought necessary to give the advisory council, headed for many years by Lord Todd (*Science*, 9 July), real power over budgets for science or to inquire into military research programs that affected civilian research and development, such as those of what is now the ministry of aviation. Another and more obvious reason for the council's weakness was the continuing resistance of the British treasury to any dilution of its wide powers over both the civil service and spending by all departments. The idea of putting a strong scientific contingent into the treasury, on the model of the alliance in the United States between the Bureau of the Budget and the President's science advisers, has not been tried.

Many British scientists think that the narrowness of the two new advisory councils leaves broad scientific policymaking up in the air. To be sure, the Prime Minister has a kind of personal science adviser, Sir Solly Zuckerman, who also advises the defense ministry and the disarmament group at the foreign office. Zuckerman isn't very optimistic about such schemes for strengthening the scientific policy machinery as the creation of a cabinet-level group of expert advisers. Such a group, headed by Lord Hankey, existed during World War II, but because official records are released very sparingly in Britian, it still is not clear how much influence this body had.

New Demands on the Royal Society

During the past few years, a time of rapid expansion of scientific and technical budgets in Britain as well as the foundation of many new universities, the Royal Society has been struggling with its role and acquiring new responsibilities such as general supervision of space science. As in the National Academy of Sciences, there has been concern about the Royal Society's emphasis on pure research as opposed to applied science. Instead of forming a separate academy of engineering, however, the Royal Society has decided to elect more fellows concerned with technology, as Lord Florey announced last spring.



P. M. S. Blackett

As the policy problems for science have grown in Britian, so has concern in and out of the Royal Society about the Society's effectiveness in giving advice about policy. There have been many complaints, and Blackett's election can be viewed as a sign of a continuing wish to act on them.

Of course, there are other reasons for Blackett's selection. Most obvious is his scientific eminence. He received the 1948 Nobel prize in physics for development of the Wilson cloud-chamber method and his application of the method to the study of cosmic rays.

This work added notably to knowledge about the interaction with matter of fast particles from radioactive sources, the nature of cosmic ray particles, and the earth's magnetism. In the 1920's, Blackett used automatic cloud chambers to measure precisely the parameters of collisions between alpha particles and atomic nuclei. He was the first to photograph the disintegration of a nucleus.

After 1931, he developed the cloud-chamber method to study collisions in cosmic ray showers, and with Occhialini showed that there were showers with nearly equal numbers of positive and negative electrons. Later, in Blackett's laboratory, Rochester and Butler further elaborated the technique to discover the first two strange particles.

A student of Rutherford's at Cambridge in the 1920's, Blackett moved on in the 1930's to professorships at Birkbeck College, the University of Manchester, and finally Imperial College.

Like a number of other physicists who were interested in the use of cosmic rays in high-energy physics, Blackett turned to other questions when large high-energy machines entered the field in the late 1940's. He became interested in geophysical questions, particularly the evidence of ancient orientations of the earth's magnetic field to be found in rocks. Blackett was greatly interested in the light that paleomagnetism might shed on the question of continental drift.

In taking up geophysical problems, Blackett called new attention to old theories about the relation between angular momentum and the magnetic field of large rotating bodies like the earth. Although new astronomical and geophysical evidence disproved Blackett's early formulation, as a Royal Society announcement noted, there was an important by-product: a special magnetometer used widely in paleomagnetic studies.

But equally important in Blackett's selection is his record of at least 30 years' interest in the political and military questions affected by scientific discovery, an interest that extends from research applied to military operations to the stimulation of science in developing countries. Moreover, Blackett has consistently identified himself with the political left and has ties of long standing with the governing Labour party. He has served both postwar Labour governments and was a major adviser to Richard Crossman when Crossman was "shadow minister for science" before Labour won the election of 1964.

One of Blackett's most important contributions was to the development of what is called "operational research" in Britian and "operations research" in the United States.

He served on the small committee of scientists, headed by Tizard, which decided, soon after it first met in early 1935, that the radar system being developed by Robert Watson-Watt was the only measure for detecting distant enemy airplanes which was likely to be ready for a war with Germany by 1940. The Tizard committee pushed the government to make big grants for the development of radar and saw to it that the British armed services trained the men needed to run the system under combat conditions. In this work, Blackett was helped by the fact that he had attended Royal Navy schools as a boy and served as Navy officer all through World War I. As readers of Snow's 1960 Godkin lectures, *Science and Government*, will recall, it was the resignations of Blackett and A. V. Hill which forced F. A. Lindemann, later Lord Cherwell and Churchill's science adviser, off the committee.

Snow describes the achievements of the committee this way: "[It] succeeded, with the help of Blackett's exceptional drive and insight, in beginning to teach one lesson each to the scientists and military, lessons that Tizard and Blackett went on teaching for 20 years. The lesson to the military was that you cannot fight wars on gusts of emotion. You have to think scientifically about your own operations. This was the start of operational research, the development of which was Blackett's major personal feat of the 1939–45 war. The lesson to the scientists was that the prerequisite of sound military advice is that the giver must convince himself that, if he were responsible for action, he himself would act so."

The committee concentrated on a defensive system in a time when many high officers of the Royal Air Force were totally committed to the doctrine that offensive air warfare, resolutely pursued, would bring an enemy quickly and relatively cheaply to his knees. The quarrels between offensive and defensive notions of air warfare became intense during the war, as official histories are beginning to make clear. In his recent 1914–1945 volume for the Oxford History of England, A. J. P. Taylor notes that both the defensive commander who won the Battle of Britain and the leader of Britain's bomber forces suffered as a result of the quarrel; the fighter commander was dismissed soon after his crucial victory, and the bomber commander was deprived of a peerage. The quarrels not only involved such alternatives as all-out bombing of built-up areas in Germany versus concerted attacks on submarines but also the question of how many bombers or fighters would be produced.

Role in Wartime Decisions

Blackett was often involved in these debates, serving as scientific adviser to the antiaircraft command, then to the antisubmarine coastal command and finally as director of Naval Operational Research. In this last position, Blackett was involved in the details of the system of convoys which, as Samuel Eliot Morrison notes in his abridged history of U.S. Navy operations during the war, were designed not only to economize on protective ships but also to attract submarines which could then be destroyed in greater numbers by combined defensive measures. Because he wanted more bombers to fight submarines, Blackett was involved in the priority battles.

The controversy was brought to a head by a memorandum from Lord Cherwell on 30 March 1942. This memorandum, mentioned in the appendix to Snow's lectures and also in the biography of Tizard by Ronald Clark, estimated that an 18-month bombing campaign could destroy nearly all the houses in built-up sections of the 58 largest German cities. The memorandum made assumptions about the damage each ton of bombs would do, what percentage of bombs dropped would fall on built-up areas, how many bombers would be available, and how many missions the average bomber would complete. Blackett asserted that Cherwell's estimates of destruction were about six times too high, while Tizard said the estimates were five times too high (the real figure turned out to be ten times). Blackett argued again for more bombers to hit submarines (if only to guarantee fuel supplies for the bombers). One such diversion, to the 1943 Bay of Biscay campaign, was crucial in the Battle of the Atlantic.

Blackett also played a role in one of the other major scientific-military decisions of World War II, the decision to push ahead with an atomic bomb. He served on the famous MAUD committee, headed by George Thomson, which, from the spring of 1940 to July 1941, supervised the British effort to determine whether an atomic weapon was feasible and would be useful in World War II. The final report of this committee, as Hewlett and Anderson note in *The New World*, helped crystallize the thinking of Vannevar Bush, James Conant, and others in the United States. The report was very optimistic about the explosive power of a bomb using uranium-235 and about building a gaseous-diffusion plant to isolate this isotope.

As it turned out, the report was too optimistic. Blackett, in fact, dissented from some of its conclusions. He predicted that the development of such a bomb would require more time and resources than his colleagues said, and therefore, that the effort should be transferred to the United States. This view became official British policy in 1942, when the United States set up the Manhattan Engineer District.

Postwar Activities

After World War II, Blackett did not cease to take part in debates about military and civilian scientific problems. He played an important role in establishing the National Research Development Corporation, which was formed to exploit inventions made in government laboratories, and served on its board for many years. The NRDC's most notable project has been the hovercraft. The corporation has recently been given much larger resources so that it can aid expensive advanced industries such as the computer industry, and fragmented, retarded industries such as that of machine tools. As vice-chairman of the advisory council of the ministry of technology Blackett has played a role in these new measures.

Blackett's book *Military and Political Consequences of Atomic Energy* was published in 1948. His series of lectures in the 1950's about the probable effects of an all-out nuclear attack on Britain, given first to the military staff college and later to university audiences, influenced opinion greatly.

Blackett has taken an interest in the development of cosmic-ray studies and atomic-energy research in India, and he holds an honorary degree from the university of New Delhi. He was a participant in the 1960 conference at Rehovot, Israel, on science and new states, and in the 1963 Geneva conference and science and technology for the benefit of underdeveloped areas.

He has also been involved in the establishment of centers for research in high-energy physics research in Europe. He helped in the foundation of the European Organization for Nuclear Research (CERN) at Geneva and served on the governing board of the British research center built around the 7-billion-electron-volt proton synchrotron Nimrod.

It will be with such a background that Blackett approaches the problem of strengthening the Royal Society's role as the voice of Britain's technical community in difficult decisions which may have to be faced quickly.

—VICTOR K. MCELHENY