

spite of more than 40 years of research, no specific laboratory or diagnostic test for either form of the disease was developed until 1967 when Blumberg and his associates noted the frequency with which Australia antigen—discovered in the blood serum of an Australian aborigine by Blumberg some years earlier—was present in the blood of sufferers from serum hepatitis.

The value of this discovery was twofold. First, it provided a new way of tackling the apparently insoluble problem of viral hepatitis. Second, it meant that by using a series of laboratory tests it became possible to detect the antigen and its corresponding antiserum in human blood. This is of great importance to blood transfusion and similar services, for the early detection and exclusion of blood donors carrying the antigen might significantly reduce the risk of hepatitis from transfusions. At first, it seemed that screening all potential donors for the Australia antigen would reduce the risk of hepatitis to the recipient by only 25 per cent, but as more sensitive laboratory tests are developed, this percentage must increase. The new report reviews a number of these techniques; at present, it seems that radioimmunoassay is potentially the most sensitive method for the detection of both antigen and antibody. In this test, purified antigen labelled with radioactive iodine is allowed to form a complex with the corresponding antibody. The ratio of complexed to unbound antigen can be estimated by gamma-ray counting, and the antibody can thus be detected by its ability to form complexes with the antigen; similarly, the Australia antigen can be detected by its ability to displace labelled antigen from a standard quantity of antibody antigen complex.

Unfortunately, Australia antigen is specific only to serum hepatitis which represents rather less risk to the population than the epidemic form. A graphic illustration of the virulence of the disease was the outbreak in Edinburgh last year, when eleven patients and staff died in the city's hospitals. Nevertheless, the intense interest which Australia antigen has focused on the problem of viral hepatitis must undoubtedly have far-reaching consequences for future research into this disease.

MATHEMATICS

Teaching Methods

from a Correspondent

A CONFERENCE sponsored by the Institute of Mathematics and its Applications attracted some 180 participants to University College, London, last week. The need for defining aims, and for facing the

inevitable changes that will become necessary in the teaching of mathematics were constantly emphasized throughout the conference and discussion ranged widely over topics which included examinations, computing, television and other aids, and ended with a look at the role of mathematics in higher education during the 1970s.

The scheduled speakers and impromptu participants in the discussion devoted much attention to ways in which the mathematical needs and interests of students could best be catered for. Professor H. Halberstam (Nottingham), in particular, pointed out the advantages of involving students in the actual teaching process, for example by dividing students into smaller groups who, after directed reading, could exhibit different presentations of the material. There was also much emphasis on the need for problems whose clear relevance to "real life" could provide the motivation for development of basic themes *en route*.

A series of talks led by lecturers from polytechnics included a detailed and penetrating study of examinations by Mr J. A. P. Hall (Hatfield) who gave considerable support to the views expressed by the National Union of Students. He concluded with a number of questions: Why not use oral examinations to help to decide in borderline cases? Why not abolish the system of announcing honours results in the three traditional grades?

The final session of the conference was given over to a discussion of modern teaching techniques, in which the Open University inevitably played a leading role. In particular, it was pointed out that the Open University is attempting to present mathematics as a unified subject to an abnormally heterogeneous population of students. But of more relevance to existing universities was the discussion by Dr C. C. Bartlett (Strathclyde) of the use of video tape for giving lecture courses to large numbers of students in science and engineering. They are given essentially a standard lecture but the saving in staff time enables much closer contact to be made with students in comparatively small tutorial groups.

NETHERLANDS

Coordination Needed

A REPORT submitted recently to the Dutch government by the Science Policy Council should dispel any lingering illusions that a final solution to the problems of guiding science can be achieved merely by setting up a body of eminent scientists to advise on national science policy. In the council's own words, the measures that were adopted four years ago, when the SPC was established, were "insufficient to produce a national science policy for different areas of concern". It is therefore no surprise to find the council advocating

the implementation of further measures for coordinating the scientific activities of various government ministries.

But, to some extent, the Science Policy Council's advice is not as far-reaching as it should be. Firmly clenching its fist to deal a sharp blow to the very structure of the government ministries, the council says that it "wonders if the whole decision making process of the government, the inherent government structure and the implementation of the government machinery are not rather questionable". But, with the help of some rather inelegant footwork, the council pulled its punch, and decided to "limit itself to searching for optimization within the possibilities existing in the present constitutional situation, without giving its opinion on whether alterations in this respect are desirable".

This decision effectively accepts that individual ministers will retain responsibility for the scientific research programmes in their own departments, and the problem becomes one of ministerial coordination. But the Science Policy Council considers that this is no bad thing. Believing that government ministers should be responsible for the objectives of their ministries, the SPC sets its face against any suggestion for establishing a separate ministry for science because this would divorce scientific research from well-defined departmental goals.

What, then, is to be done to evolve a coherent science policy? The SPC has few suggestions to offer, except to exhort the government to intensify the informal ministerial deliberations on science policy, and to extend the activities of the Standing Interdepartmental Committee on Science Policy. This committee, the council suggests, should be composed of senior civil servants who are well versed in scientific matters and who are involved in ministerial policymaking.

The Science Policy Council does, however, float one idea for coordinating science policy at the policymaking level. It recommends the creation of a special General-Directorate, whose task should be "the coordination of science policy and the support of extramural university research in general, as far as this is not incorporated in some other ministry's function". The directorate, the SPC suggests, should be linked to the Ministry of Education and Science.

Finally, unable to resist the temptation to discuss the government's decision-making process, the SPC advocates the appointment of three secretaries of state who should be attached to the Ministry for Education and Science: one for primary and secondary education, one for university education, and one for national science policy. The latter should have political responsibility for a "diversified programme of science policy", and direct responsibility for a number of scientific agencies and institutes.