

of various health problems which arise from malnutrition. The consequences of infection are made worse by malnutrition. Weanling diarrhoea, which is almost universal in developing countries, is caused by a combination of malnutrition and reduced resistance to infection in an environment with poor sanitation. The committee recommends that the relationship between malnutrition and resistance should be investigated and stressed in the education of medical and public health workers.

Iron deficiency is one of the causes of anaemia, and a programme of study initiated by WHO in 1961 is in progress to investigate this problem. The contribution of factors such as loss of blood caused by hookworm infection is also being investigated. Experiments with iron-59 have shown that iron from wheat is less readily absorbed than haemoglobin, ferritin or ferrous ascorbate, and people deficient in iron absorb less iron from wheat than do healthy people. The committee recommends that, while such studies should continue, more emphasis should be placed on anaemia in infancy and childhood, times when it is possible that iron deficiency could cause irreparable damage to the blood and other tissues such as the gastro-intestinal tract. Vitamin A deficiency is another serious problem, causing various diseases of the eye in infants and young children in Asia, Africa and Latin America. In South and East Asia such diseases constitute an important cause of preventable blindness. An effective preventive treatment for vitamin A deficiency is likely to be the enrichment of foodstuffs with the vitamin. The committee recommends investigation of the stability of vitamin A in enriched foods, and the effects of cooking on its biological activity.

Rickets, caused by vitamin D deficiency and lack of exposure to sunshine, is prevalent in many tropical and subtropical countries—in North Africa a WHO consultant found signs of the disease in between 45 and 60 per cent of children between birth and 5 years old. It has been suggested that rickets influences infant mortality by lowering resistance to infections and aggravating the course of pneumonia and bronchopneumonia. As measures to prevent rickets, the committee recommends supplementing breast milk with vitamin after the third or fourth month, treatment with vitamin D during the first 2 years of life as a public health measure, and education of mothers to expose their children to sufficient sunlight. Daily administration of vitamin D will not be easy to achieve, and other approaches such as the use of periodic massive doses may be tried.

Progress is also being made in the control of endemic goitre by the introduction of iodized salt to counteract iodine deficiency. In the Himalayan endemic goitre belt there has been a striking reduction—from about 40 per cent to 15 per cent—in the prevalence of the condition in areas receiving salt fortified with potassium iodide or iodate.

There is also some evidence that malnutrition in early childhood can adversely affect mental development, although there are so many complicating social factors that the results of intelligence tests are very difficult to assess in these terms. The committee recommends that studies should be encouraged to assess the effects of malnutrition on mental development, learning and behaviour of young children, and that, when sufficient data have been accumulated, possibly within

5 years, an expert group should be convened by WHO to discuss the evidence.

## Alerting Chemists Quickly

It is becoming increasingly difficult for the information section of an organization to keep research staff informed of the literature. Scanning journals for articles of likely interest to research staff, and attempting to keep up to date with their changing interests and projects, can put a great strain on the information staff. While the ratio of information to research staff in the USA is 1 : 10, in Britain 1 : 30 is more usual, and 1 : 500 is not unknown. Use of printed current awareness journals can help to some extent, particularly in small organizations or in those with restricted subject interests. A new innovation is the use of computers for current awareness, providing what is known as a Selective Dissemination of Information service (SDI); that is, a service aimed at alerting research staff to material relevant to their subject interests. The application of computers to SDI is only just beginning in Britain, but there are a few research programmes in progress now, and there is growing experience of the use of magnetic-tape outputs from large literature-handling services such as MEDLARS and Chemical Abstract Services.

The main computer-based service operating at present is the Chemical Society Research Unit in Information Dissemination and Retrieval at Nottingham University supported by the Office for Scientific and Technical Information. This unit is currently running searches (on a KDF 9 system) of the magnetic tape versions of *Chemical Titles (CT)*, *Chemical Biological Activities (CBAC)* from the Chemical Abstracts Services, for a selected user population of more than 300 chemists. Two other mechanized SDI services for chemists are those being run at the UKAEA laboratory at Aldermaston and the Shell laboratory, Sittingbourne. These are also based on taped *CT*. Outlines of these services, which are still in the experimental stage, were given by Mr L. Corbett of Aldermaston and Mr P. Gallagher of Sittingbourne at a meeting of the Institute of Information Scientists on March 13. Their talk was entitled, "Using Commercially Available Literature Tapes and 'Package' Computer Programmes for Current Awareness Services". Mr Corbett spoke of the advantages, limitations, potential and user reactions, and effects of the mechanized literature services operated at Aldermaston, and Mr Gallagher concentrated on features and problems of the programmes and machine operations.

At Nottingham, the unit has developed its own programmes for the university's computer. The Aldermaston and Shell services, however, use IBM 360/40 computers with the "1401 package" programmes of *CT*. Experimental runs on issues of *CT* were begun at Aldermaston in 1966. Twenty issues have now been run. The maximum throughput is 150 questions consisting of approximately 700 search words. These have to be processed in two "passes" through the computer for each *CT* issue. There are now more than 40 users of the service. The machine time per issue is 1½–1¾ hours, and the number of references distributed is about 800. On the usefulness of the references or "hits" sent to users, Mr Corbett

illustrated a sample analysis of ten questions. Results of these showed an average relevance (precision) of 52.7 per cent. The size of this figure is not as important in current literature alerting as in retrospective information retrieval. It is in fact not desirable to have too narrow a field for current awareness—there should be room for “idea stimulating” information, developments in neighbouring fields, and so on. The general relevance level of the references responded to (about 75 per cent) is 20 to 30 per cent, the average level for a question being about 35 per cent.

Other “literature on tape” services were also discussed at the meeting. Both Mr Corbett and Mr Gallagher spoke of the effects of SDI on the research staff, who certainly want it and like it. Given a regular service, they show a tendency to alter and improve their “literature-use” habits individually and as “teams”; this also applies to research/information staff communications.

## Defence Research

THERE was a mood of intense self-questioning in Britain about the national investment in research and development, Professor P. M. S. Blackett told the Select Committee on Science and Technology on March 14. The dominant feeling was that the investment had not been wisely made; despite expenditures much greater than those in other countries, Britain's growth rate was slow. But Professor Blackett was optimistic that now there was intense activity, centred on the Ministry of Technology, which would help to change all this. The most important thing, he thought, was to persuade more scientifically qualified people to go into management—engineers were particularly important. “Historically we have failed to match management with technology,” he said.

Although the committee is launched on an investigation of the defence research establishments, it made little progress towards its objective in this session. Professor Blackett's recent experience as an adviser to the Ministry of Technology and the cogent memorandum which he presented to the committee were both in the civil rather than the military field. Often he frankly admitted that the questions were outside his competence. In consequence, the session was spent in discussion of rather generalized notions of how Britain's economic performance could be improved. Briefly, this meant a discussion of the twin doctrines of size and selectivity.

In his memorandum, Professor Blackett provided a compelling argument in favour of large firms. Since few firms can afford to spend more than 5 per cent of their turnover on research and development, it followed that a firm's turnover must be at least twenty times its research expenditure. It was worthless to employ less than about five to ten qualified scientists and engineers, each of whom cost £10,000 a year to keep going. For a team of ten scientists, then, the firm must have a turnover of £2,000,000 a year. Without this, it would be unlikely to survive for long in a rapidly advancing technology, although if it were exceptionally lucky it might get along for a little while. As for selectivity, Professor Blackett said that it was inescapable, because Britain had reached the limit of what could be done by broad fiscal means. If the work of government laboratories was to be used, it had to be

offered to one firm on the basis of exclusivity, or perhaps to two firms. If the results were thrown open to all, nobody took them up, he said.

Conservative members expressed some anxiety about this approach. Sir Ian Orr-Ewing suggested that civil servants were not sufficiently well-equipped to make decisions of this sort. Professor Blackett denied that the National Research Development Corporation or the Industrial Reorganization Corporation were part of the civil service. As for the Ministry of Technology, there was a new section, concerned with industry, which he thought was well able to make these decisions. And government purchasing power should also be more widely used as a selective mechanism. It might be necessary to look at the whole company structure—exports, research and development structure, and the like—before awarding contracts. This would mean that the Government would not always accept the lowest price offered.

## Parliament in Britain

by our Parliamentary Correspondent

### Fuel Policy

MR ARTHUR PALMER and Sir Harry Legge-Bourke, both members of the Select Committee on Science and Technology, pressed the Minister of Power to make clear his policy on fuel. Mr Palmer suggested that there were as many fuel policies as there were chairmen of nationalized industries, but Mr Marsh, Minister of Power, denied this. He said that the Government's policy was not in conflict with the report of the select committee on the nuclear power industry in Britain, and that he and the Minister of Technology were both discussing this “large and important” document. They hoped to come to Parliament soon with their conclusions.

### High Temperature Reactors

MR R. FREESON, for the Ministry of Power, refused a request from Mr Eric Lubbock that he should direct the Central Electricity Generating Board to seek tenders for high temperature reactors for future power stations. Mr Freeson said it was not a matter in which a general directive was appropriate. Mr Lubbock asked sharply whether Mr Freeson was aware that the tender for the Hartlepool power station by the Nuclear Power Group, using a high temperature reactor, was several million pounds cheaper than the next quotation. Was he also aware that electrical utilities in the United States published all details of tenders? Mr Freeson said that these were matters for the CEBG.

### Dainton Report

MR PATRICK GORDON WALKER, Secretary of State for Education and Science, refused to be drawn on the subject of the Dainton report. Mr Christopher Price, who asked the minister for a statement, wanted to know if he agreed that all children should study mathematics until they left school. If so, he asked, where were the mathematics teachers to come from? Mr Gordon Walker said that most of the recommendations of the report were directed at local authorities, universities and schools, and he did not think that he was yet called on to give a view. But he said that he was having consultations with various bodies and associations concerned, and was gratified that “there has been a general acceptance that the swing away from science is wrong, and should be reversed”. He would, he said, make a statement in due course.