

facilities that exist for the detection of cancer, and of preventive medicine in general. It is, perhaps, unfortunate that the appeal launched by the campaign last week should coincide with the publication of the report which, in urging that caution be the keynote in the development of screening programmes, may do much to throw cold water on the campaigners' efforts.

## MEDICINE

### Avoiding Towers of Babel

THE use of computers in hospitals is becoming increasingly important, and computing facilities, particularly within the National Health Service, are expanding rapidly. Because the range of uses for computers is so wide and so many different people—from nurses to computer specialists—need to use the facilities, the question of what language, or languages, to use looms large.

A committee set up by the Ministry of Health in 1967 to consider the need for a special medical computing language has now published its report (Ministry of Health, free). The committee felt it could not at this stage justify the development of a new language, because so many of the computer languages already in existence have not yet been fully exploited. There is, however, a case for creating a standard command language so that hospital staff members can communicate with different computers in different hospitals without having to learn new procedures. A command language could be used by people without any training in computer science and would consist of accepted words and phrases like "tell blood sugar" or "tell diet" which would instruct the computer to give the details required.

Programmes are needed to implement the command words and also for a wide range of clinical, administrative, managerial and research activities. Research into the routine aspects of diagnosis, operational research programmes and statistical analyses, for example, rely heavily on computer techniques. Clinical applications include the control of the issue of drugs, the organization of laboratory services, therapeutic and diagnostic radiology and monitoring patients.

Most of these applications involve at some stage obtaining data from, and perhaps updating, a file in the computer—the patient's record, for example. This means that the language used must be capable of efficient file processing. Cobol is the only widely used language with this facility, although experimental languages such as BCL (used at the universities of London and Cambridge and the Massachusetts Institute of Technology) and POP 2 (developed at the University of Edinburgh) are also contenders. The language must be simple to use and flexible enough to deal with various tasks. On the other hand, if the language is made too conversational, the time taken by the computer to compile it will be excessive. With these considerations in mind the committee suggested that a programming system should be so designed that programmes in any language can communicate with a common file structure and that segments of programmes in different languages should be capable of being combined into a single programme. The committee concluded that the new languages, BCL and POP 2, seem promising but need to be carefully tested

before they can be recommended and that, in the meantime, the well established languages, Fortran and Cobol, should be used.

## CHEMISTRY

### Keeping a Check

THE implications of the switch to metric units were at last brought home to the British public last week. The Government Chemist, in his report for 1967 (HMSO 22s 6d), revealed that the ancient system of measuring alcoholic strength as a percentage of proof spirit is to be replaced by a new metric system.

Apart from routine checks on alcoholic drinks and tobacco products and a miscellany of other odd jobs for the Customs and Excise, including classifying various imports into customs tariff categories, the laboratory is empowered to provide advisory services to any government department that requests them and has statutory obligations under the various food, drug and pesticide acts. As an indication of the scale of all these activities, the laboratory examined about 1,000 products of one sort or another every working day and the work ranged from monitoring radioactive pollution near nuclear power stations and air pollution near the Elgin marbles in the British Museum to examining documents for forgeries and toys for lead paint.

With the increasing use of organochlorine compounds in agriculture, the laboratory is becoming preoccupied with monitoring agricultural produce for contamination. Since 1962, for example, it has been analysing samples of home-produced and imported milk, butter, and meat fat-foods which carry the maximum hazard arising from the use of pesticides. The amount of dieldrin in milk produced in Britain gives cause for concern. Last year a substantial number of samples had more than the limit of 0.003 p.p.m. proposed by the Food Additives and Contaminants Committee in 1967. On the brighter side, the levels of dieldrin in mutton fat have dropped since the decision to prohibit the sale of sheep dips containing the compound (see Table 1). The levels of DDT in Australian and New Zealand butter, which account for 75 per cent of the British consumption, seem needlessly high (see Table 2).

As well as analysing food and domestic animals, the laboratory, in conjunction with the Natural Environment Research Council, monitors wildlife for traces of organochlorine compounds and last year identified another and unexpected source of contamination. For several years unidentified organochlorides, with long retention times, had been appearing in increasing amounts in chromatograms of eggs and fat samples of wildlife. Following a lead from Sweden, these compounds were identified last year as polychlorobiphenyls. Polychlorobiphenyls and polychloroterphenyls are not used in pesticides, nor are they pesticide metabolites, but they are widely used in paints, plastics and insulating fluids. They are apparently entering the food chain of wildlife and probably represent a greater threat than pesticides, especially to birds. A sample of liver taken

Table 1. DIELDRIN CONTENT OF MUTTON KIDNEY FATS 1964-67

Year	No. of samples	Dieldrin (p.p.m.)	
		Range	Mean
1964	128	0 to 12.4	0.84
1965	107	0 to 8.2	1.1
1966	101	0 to 5.3	0.44
1967	76	0 to 8.0	0.24



Table 2. PARTS PER MILLION OF ORGANOCHLORINE PESTICIDE RESIDUES IN FOODSTUFFS—1967

Butter		Total BHC isomers		Dieldrin (HEOD)		DDT+DDE+TDE	
Country of origin	No. of samples	Range	Mean	Range	Mean	Range	Mean
Australia	35	0-0.05	0.01	0-0.03	0.01	0.01-2.0	0.27
Denmark	12	0.02-0.09	0.05	0.01-0.05	0.03	0.02-0.07	0.04
Ireland	6	0.02-0.12	0.05	0.01-0.04	0.02	0.02-0.07	0.05
New Zealand	49	0-0.03	*	0-0.04	*	0.02-0.70	0.21
UK	22	0.03-0.15	0.07	0.02-0.07	0.03	0.02-0.11	0.05
Beef kidney fat		Total BHC isomers		Dieldrin (HEOD)		DDT+DDE+TDE	
Country of origin	No. of samples	Range	Mean	Range	Mean	Range	Mean
Argentina	37	0.01-3.9	0.65	0-0.85	0.10	0-0.24	0.03
UK	36	0.01-1.55	0.18	0.01-0.12	0.03	0.01-0.14	0.04

\* Less than 0.01 p.p.m.

from a dead kestrel, for example, contained about twelve nanograms of polychlorobiphenyls and only a total of 0.8 nanograms of pesticides, of which 0.33 nanograms was beta-BHC, an isomer of BHC generally regarded as non-toxic to wildlife. The discovery of contamination by polychlorobiphenyls raises several questions. How are they entering the food chain and why are they accumulated most frequently and in the largest proportions by wildlife? The accumulations in man and domestic animals are very small. The laboratory also collaborated with the British Antarctic Survey in 1967, showing that Antarctic wildlife is contaminated with DDT and organochlorine pesticides which must have been carried to Antarctica in the air or sea (*Nature*, **215**, 346; 1967).

## SCREENING

### Give Up Smoking

How can the general practitioner detect incipient lung disease? The Office of Health Economics, an offshoot of the trade association of the British pharmaceutical industry, has just published a paper explaining for the benefit of GPs the current screening methods, and the impact on the health of the patient of early detection of disease. "The early diagnosis of some diseases of the lung", written by Dr A. L. Cochrane of the MRC Epidemiological Research Unit and Dr C. M. Fletcher of the Royal Postgraduate Medical School, discusses how the GP can diagnose lung disease, and can reduce mortality by persuading his patients to give up smoking.

In the United Kingdom, chronic bronchitis and emphysema cause 7 per cent of all deaths in men and 3 per cent in women between the ages of 45 and 64. Three manifestations of bronchitis are now recognized and can be diagnosed by the GP: simple chronic bronchitis is characterized by persistent mucoid expectoration, while in mucopurulent bronchitis the sputum is purulent because of active bronchial infection. Obstructive bronchitis, which is characterized by narrowing of the airways and therefore increased resistance to airflow, is diagnosed by spirometry or by use of the Wright Peak Flow Meter. A spirometer records both the forced expiratory volume in one second (FEV 1.0) and the total expired volume or vital capacity (VC), either on a graph or on a dial. When there is narrowing of the airways and therefore delayed expectoration, the proportion of air expired in the first second (FEC/VC) will be less than 65 per cent. The Wright Peak Flow Meter measures the degree of impairment of ventilatory capacity. The length of time required for a forced expiration shows whether impairment is due to airflow obstruction or to restriction of lung expansion—as might be caused by skeletal disease, pulmonary disease or loss of functioning lung. Normally the forced expansion time is six seconds and in cases of airflow obstruction this is increased.

Surveys have shown a close association between the three manifestations of chronic bronchitis, and this has led to the suggestion that mucous hypersecretion in the bronchi encourages infection which damages the lungs and results in obstructive bronchitis or emphysema. From this came the suggestion that preventive and therapeutic methods applied to simple cases of bronchitis might delay the onset of disabling airways obstruction. Recent studies have thrown doubt on this hypothesis; a trial of the effect of chemotherapy on bronchitic patients showed no difference in the rate of decline of FEV or of the volume and purulence of sputum between the patients and the controls. Improvement was noted, however, among the patients who had given up smoking.

Bronchial carcinoma, which accounts for a steadily increasing number of deaths, is best detected by chest X-ray and sputum cytology; the former method, which is cheaper and quicker, is the more acceptable. Treatment cannot be successful unless detection precedes metastasis; unfortunately, 80 per cent of the patients whose tumours are removed by surgery die with metastasis, showing that this occurs before the disease can be radiologically diagnosed. Until there is an improvement in the methods of treatment of lung cancer, there is little point in advocating regular routine chest X-rays and sputum examination for the prevention and control of the disease. Dr Cochrane and Dr Fletcher do emphasize, however, that the routine testing of cigarette smokers could remind the patients of the risks they run and of the rapidly declining risk if they manage to give up smoking.

INDUSTRIAL RESEARCH

### IRDC Laser Show

THE International Research and Development Corporation at Newcastle upon Tyne has been making some progress with the application of lasers. The company claims no radical new invention or even any new slant on the use of lasers, but the modification and streamlining of already established techniques.

## INDUSTRIAL RESEARCH

### IRDC Laser Show

The most notable advance has been in the medical field. A new easy-to-use laser ophthalmoscope has been developed in a joint research and development project with the Royal Victoria Infirmary at Newcastle upon Tyne. This instrument is used to "weld" a displaced part of a retina back into position and is designed so that the surgeon can handle it and yet observe the relevant part of the eye at the same time. Collaboration between the hospital and the IRDC in the use of lasers to detect malignant cells in cervical smears has also been fruitful, but a similar series of tests performed with the Queen Elizabeth Hospital at Gateshead has produced results that conflict with conventional diagnoses.

The property of a laser of producing an intense beam of coherent light makes it a useful laboratory instrument for demonstrating the physics associated with waves, and IRD has produced a portable gas laser selling at about £170 for use in universities and schools.