crack the United States market where housewives are apparently against pre-soaking—once through the washing machine must suffice. The enzyme content of these products is less than 1 per cent by weight, and the enzyme material itself is merely a partially purified culture filtrate so that the traditional cost of enzyme separation barely makes itself felt. Not content even with the performance of the new alkali-resistant proteinase, however, several manufacturers are now looking for an enzyme which would have a shelf life of months when mixed with liquid detergent—all the products so far have been solid.

PATENT LAW

Protection for Programmers

ARE computer programmes industrial processes, works of art or abstractions of the mind? If the first, they can be patented; if the second, they can be copyrighted; but if the third, law offers them no protection. To the chagrin of software companies—programme bureaux, computer consultants and the like—opinion on both sides of the Atlantic seems to be drifting to the conclusion that programmes are in this third category. Last week, Edward J. Brenner, the US Patent Commissioner, announced the decision of his legal staff that programmes are not patentable. Copyright protection is available, but apparently it is of little use. It protects only the mode of presentation of a programme and it is a trivial matter to change the presentation while leaving the logic intact.

Early this year, the US Patent Office unwittingly granted a patent for a "sorting system" defined in terms of specific equipment. Afterwards, the deviser of the system announced that his invention was a computer programme and no more. The patent will stand unless challenged in the courts. This episode emphasizes the legal and logical confusion that surrounds the situation. A programme may start off as a sequence of intellectual ideas, become a stack of punched cards and end up as a hard-wired piece of electronic circuitry integral to some manufacturing process. Somewhere along the line, the programme becomes patentable, but nobody—neither lawyer nor programmer—is prepared to say just where.

The British Patent Office has not so far followed its US counterpart in issuing a hard line on the subject. A spokesman for the office said this week that any patent application for a computer programme would be treated strictly on its merits, the criterion being whether the programme amounted—in a phrase dating from 1624—to a "manner of new manufacture". So far, no patents have been issued, but a couple are pending. British Petroleum, Ltd, filed an application for a linear programme method in 1962, and the application was published in 1966. IBM promptly lodged an objection and the Patent Office hearing of this objection is yet to be completed.

Computer manufacturers such as IBM are opposed to the patenting of programmes on obvious commercial grounds, while programme consultants defend the idea for reasons just as obvious. CEIR Ltd, a London firm of programme consultants, takes a philosophic view, however. It feels that the difficulties of proving someone has infringed a programme patent would be so enormous as to make the securing of patents valueless from the start. CEIR may invest £200,000 in the development of a particular programme, so that some form of commercial defence is necessary, but the firm chooses to rely on contract law for its dealings with employees and clients. It is, however, debatable whether contract law is adequate in an industry so inured to a rapid turnover of personnel.

SOCIAL MEDICINE

Doubts about Screening

THE future of medical screening as a means of diagnosing disease in the presymptomatic stage remains very much in the balance. Out of ten screening procedures that are already in use, only four—tuberculosis, rhesus disease of the newborn, phenylketonuria and deafness in childhood—can really be justified on both biological and economic grounds. This much is made clear in a recent report, *Screening in Medical Care: Reviewing the Evidence*, published by Oxford University Press for the Nuffield Provincial Hospitals Trust (35*s*).

Screening for cervical cancer comes under particularly heavy fire from E. G. Knox, professor of social medicine at Birmingham University. One of the chief difficulties here, he says, is that little is known about the natural history of the disease; for example, the frequency with which non-invasive lesions become invasive, the interval after which this is likely to happen, and the frequency with which non-invasive lesions regress. In addition, the optimum time interval at which examinations should be carried out has not yet been fully established. Also, although some workers recommend that all women older than 20 should be screened, the Ministry of Health scheme (now the Department of Health and Social Security) virtually limits screening to women over 35; that is, those women believed to be at highest risk. Yet another problem that has to be taken into consideration is that treatment, especially of clinical cancer, is far from satisfactory, and loss of fertility after conization of the cervix and hysterectomy is not unknown.

If 50 per cent of women over 21 accepted the offer of a four-yearly screening programme, the report says that the total annual cost would lie somewhere between one and four million pounds. Professor Knox adds that there would probably be little saving in terms of clinical disease for the first ten to fifteen years so that, at the highest estimate, a total expenditure of about £40 million would be involved before substantial returns could be expected. Taking the most optimistic view, screening would prevent about 1,400 invasive cancers a year in the long run.

Undaunted by these claims, Lady Donaldson, chairman of the Women's National Cancer Control Campaign, is actively promoting a project launched last week by Sir John Peel. The intention is to send out mobile clinics to test women for breast and cervical cancer. Lady Donaldson has recently complained that a number of clinics providing screening facilities for the detection of cervical cancer are closing down, chiefly because of inadequate publicity. Although there are no available figures on these closures, publicity—which is the responsibility of local authorities—seems to be very hit and miss, and there is clearly a need for women (particularly those who do not read middle-class newspapers) to be made aware of the

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 22*s* 6*d*), 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 or 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