

fact that 90 per cent of British firms employ less than 200 people, and that most of these firms neither employ graduates nor possess library facilities. He described the activities of the regional offices of the Ministry of Technology, and cooperative ventures with research associations, in bringing information about innovations to small firms in a form that would be easily understood and applied.

Two sessions were devoted to papers by social scientists and operational research workers. Mr G. F. Ray, senior research officer, National Institute of Economic and Social Research, took up Mr Thompson's comments on lack of scientifically trained managers. He described a joint research project by economic research institutions in six European countries to compare the dissemination of ten relatively new technological processes. Provisional results indicated considerable differences in the dates of the introduction of the new processes in the six countries, but even bigger differences in the diffusion rates of the innovations in these countries. While some of the differences could be accounted for by economic factors, the substantial residue was thought to be due to the attitude of managers to technical change.

Mr T. W. Harries of the Centre for the Utilization of Social Science Research, Loughborough University of Technology, emphasized the importance of psychological and sociological factors in the diffusion of innovation. He related the empirical findings of some research projects to Everett Rogers's model of the diffusion of innovation. Some findings suggest the need to modify the model, but the exercise emphasized the need for conceptual frameworks if empirical research is to provide meaningful lessons for practising information scientists seeking to increase effectiveness. Existing models and empirical data suggested that information scientists should not view increased effectiveness in terms of a simplistic cause and effect framework.

Dr T. E. Easterfield of the Ministry of Technology emphasized the need for information about situations as well as information about facts. Mr S. Hunter of the British Iron and Steel Research Association described a research programme to establish criteria for selecting and evaluating research projects. Particular attention was given to the problem of disseminating research results to managers, and "selling channels" were evaluated by means of interviews in terms of (a) informing managers of the existence of an innovation and (b) persuading them to implement. Both the cost and benefit of a given selling strategy were assessed and a criterion was developed to calculate the optimal time for terminating the selling effort.

Finally, two sessions were given over to practising information scientists. Mrs M. Griffin of Corporate Marketing, Research and Information Services Departments, Smith Industries Ltd, described a less orthodox use of marketing research; that of providing the link, sometimes missing, between technical and marketing personnel. In this way market research served both inventors and researchers by stimulating innovation and giving direction for research and development.

Miss Rowena Swanson of the United States Airforce Office of Scientific Research (AOR) Arlington acknowledged the need for models. She recognized that information services are effective only when they "connect" with people, and that complex interrelation-

ships of factors are involved in the diffusion of innovation. She disagreed with the suggested need to concentrate on personal contacts at the expense of the written word, quoting examples in the United States where scientists and engineers had changed to written channels as the result of action research and educational programmes by information scientists.

EQUIPMENT EXHIBITION

Show-All

"BIGGER and better than ever before" is how the organizers of Labex International described this year's exhibition which opened at Earls Court on Tuesday. This fairground ebullience was tempered on the opening day with apologies, for last minute labour troubles meant that the exhibition had to open before it was complete. All the planned exhibits were on show, but lack of decoration gave them something of a makeshift air. The exhibition is the tenth Labex, and as usual is sponsored jointly by the Scientific Instrument Manufacturers Association and *Laboratory Practice*. There are 212 exhibitors this time, 73 of them first-timers, and the organizers expect 25,000 visitors. This is a fair coverage of the scientific profession—it is fully one quarter of the number of scientists practising in Britain.

As usual, the exhibition caters for every level of price and sophistication. Test tube holders and filter funnels stand next to the gleaming last word in ultracentrifuges. No single theme dominates the exhibition but it is impossible not to be struck by the new generation of spectrophotometers, with typewriter consoles (for digital read-out) nestling happily alongside the familiar sample holders and strip chart recorders. Impressive, too, was the latest automatic assay equipment designed for clinical laboratories.

New reagents are on display as well as new machines, and an enzyme preparation capable of making a specific and sensitive assay of noradrenaline is bound to attract wide attention. The enzyme is phenylethanolamine-N-methyltransferase, and it is claimed to be able to measure noradrenaline in less than one milligram of tissue.

A wide ranging programme of lectures and discussions has been arranged in parallel with the exhibition. The organizers were proud to relate that one lecture—by Dr Eglinton of Bristol on the organic constituents of ancient rocks—had to be cancelled because Dr Eglinton has left for the United States to help organize the analysis of the NASA moon samples that are due this year. The handful of people seeking to hear the government chemist, Dr D. T. Lewis, describe his heterodox theory of fundamental particles were seriously impeded by the unfinished woodwork

COLOUR TECHNOLOGY

All Things Bright and Beautiful

WHAT must certainly be the most colourful of the scientific exhibitions was held this week at Alexandra Palace. For the contributors to the technical exhibition of the Oil and Colour Chemists Association presented its wares amid a kaleidoscope of fluorescent

oranges, greens, purples and yellows. There were more continental exhibitors than previously and most of the West European countries were represented, as well as East Germany. The overall impression given by the display, however, was of general development rather than revolutionary innovations.

Manufacturers are constantly seeking new pigments soluble in volatile solvents for fast drying inks, and some of these were shown. There has also been a general improvement in the stability and colour retention of resins, solventless corrosion resistant coatings for marine applications and low odour compounds for interior decorating. The relatively new "chloride" process for the manufacture of titanium dioxide—the whitest white pigment—gives a purer, whiter product than the old "sulphate" process and the applications now range from paints, plastics and printing inks to leather, cosmetics and artists' colours.

One interesting device on show was a combination of spectrophotometer, data-transfer system and computer which measures the reflectance of a dyestuff on a substrate at sixteen spectral points and stores this information. This enables colour matching and prediction of dye recipes to be accomplished very easily. Other exhibits included a particle size disk centrifuge and the usual selection of viscometers, tackometers, mixers, mills and grinders. Also on show is the cabinet developed by the Paint Research Station for testing the fungicidal activity of paint films. This cabinet can be adapted to simulate fungal attack in the tropics or inside breweries, for example, and should be useful in the study of the disfigurement of painted surfaces by biological attack.

The brightest stands were, of course, those exhibiting daylight fluorescent pigments. Fluorescent colours are about four times as easy to see as the nearest and brightest non-fluorescent colour and are available in a range of hues with such picturesque names as "saturn yellow", "sunset orange" and "rocket red". The chief uses for these brilliant colours are in paints, PVC and paper and textile printing. Several interesting new colour stylings for cars were also to be seen; a range of gold shades produced by mixing a new pigment called "Gold Powder Lake" with aluminium powder was particularly pleasing.

PROFESSIONS

Women in Chemical Engineering

ON March 24, the third week of Women in Engineering Year was marked by a conference held by the Institution of Chemical Engineers at University College, London. Professor J. F. Richardson, chairman of the institution's careers committee, provided the theme for the conference by saying that the task of attracting more women to chemical engineering needs to be tackled in the schools. The conference seemed to agree that opportunities for study and employment are apparently available in plenty if only girls would take advantage of them.

Dr J. W. Mullin pointed out the value of flexibility in chemical engineering courses. At University College, London, where Dr Mullin teaches, there is, as well as the three year course in chemical engineering, a one year diploma course for graduates in chemistry or other engineering subjects. Girls in particular seem

often to be encouraged to study chemistry rather than chemical engineering, so that conversion courses can help to save them for chemical engineering.

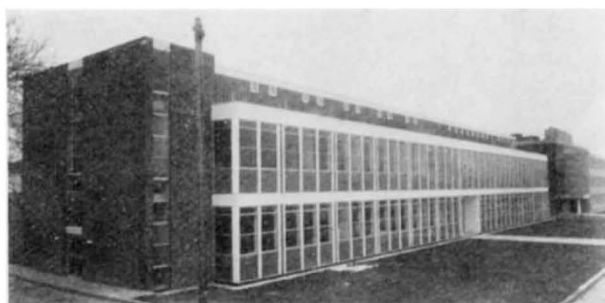
The MSc and diploma courses in biochemical engineering—covering topics such as enzyme kinetics, metabolic regulation and immunochemistry—and the joint honours course in chemical engineering and microbiology beginning at Swansea next September, should help to attract girls. When twenty-eight sixth form girls attended a week's course last summer at Swansea, the response was apparently most encouraging, and some university departments do seem to be prepared to follow flexible policies on admissions.

Dr M. Guter, managing director of CJB (Projects) Ltd, saw no barriers to the employment of women as chemical engineers, except perhaps in the commissioning and operating of plant abroad—sites such as those in Algeria on which his company is now working, for example. The general opinion of industrialists present was that there would be no prejudice against women in chemical engineering if only they were available to be considered for jobs. Raising families was not seen as a great problem for, as Mr C. S. Windebank, past president of the institution, said, the turnover of female staff to be expected as a result of marriage is equalled by the turnover of men, which merely reflects the modern attitude to employment. Dr P. Eisenklam of Imperial College, London, made the telling point that employers expect a positive creative contribution from chemical engineers early in their career, so that the loss of married women should be insignificant.

ARCHITECTURE

Laboratory at Porton Down

A NEW laboratory costing £207,000 was opened at the Chemical Defence Establishment at Porton Down on March 21, by Mr J. Morris of the Ministry of Defence. The building has been specially designed for work on



aerosols and air cleaning techniques, and will house the physicists at the establishment. Critics of research on chemical warfare will no doubt rejoice at the lack of architectural distinction.

FOUNDATIONS

A Cosy World

IN spite of being closed to visitors for two months for building work, the Ciba Foundation managed its usual range of business in 1968. According to its