OCEANOGRAPHY

Swimming with the Current

SOVIET oceanographers in the research ship *M. Lomonosov* seem to have discovered an undercurrent running east in the Atlantic which bears a remarkable resemblance to the equatorial undercurrent first discovered by J. Y. Buchanan from a British ship in 1883. According to *Pravda* (December 24, 1969), the undercurrent lies beneath the South Passat stream and carries about forty million tons of water a second—about half the rate of flow of the gulf stream—at a velocity of up to 120 cm/s. The undercurrent, which has been named the Lomonosov Stream by the Ukrainian Academy of Sciences, is quoted as being 400 kilometres wide and having a vertical depth of between 200 and 250 metres. It flows east along the equator for more than 4,000 kilometres.

The current discovered by Buchanan, which is known in the United States as the Cromwell current and elsewhere as the equatorial undercurrent, seems to be situated in exactly the same place as the Lomonosov Stream and to flow at an identical velocity.

POLAR RESEARCH

Russians at the Ends of the World

from our Soviet Correspondent

AN end of year survey (see *Pravda* January 2, 1970) of Soviet polar research carried out in 1969 by the Arctic and Antarctic Scientific Research Institute reveals a programme that is both diverse and intensive. One section alone—that dealing with the study of ice drift—organized twenty-three Arctic expeditions which maintained drifting research stations, studied the ice in Vil'kitskogo Sound (between the Russian arctic mainland and Severnaya Zemlya) and set up an extensive network of DARMS (drifting automatic radio-meteorological stations).

A sea-going expedition in the research ship Professor Zubov spent the autumn in the North Atlantic and Arctic Oceans. In spite of bad weather, the complement of some fifty meteorologists, oceanologists and hydrochemists report further progress in their investigations of the interaction between ocean and atmosphere, although several more years work will be needed before definitive results can be announced. This year's results, however, have permitted some preliminary data to be established which will, it is hoped, lead to a greater precision in forecasting temperature and ice conditions.

Two large-scale Antarctic expeditions (the fourteenth and fifteenth) are at present in progress, based on the research ship Professor Vize and the diesel vessel *Ob'*; the personnel of these two expeditions—scientists and crew—totals some 600.

Finally, the survey discussed the most "news-worthy" of the institute's research projects; the ice floe based research stations North Pole 16, 18 and 19. (NP-17 is apparently no longer manned.) These are at present drifting between latitudes 75 and 84 N, in temperatures down to -40°C . The work programme of the stations includes 3-hourly transmissions of meteorological data and transmission twice daily of aerological data, as well as oceanological and geophysical observations.

MANPOWER

Why Industry lacks Appeal

IF industry wants to increase its share of the better graduates, it must improve its image in the universities. This is the main conclusion to be drawn from a survey carried out by the Cambridge University Management Group (available from the British Institute of Management). The survey indicates that many undergraduates are deterred from entering industry because they do not want to become involved in the rat race and lose their identities. Other factors militating against industrial recruitment are the belief that industry offers an unattractive political and ethical environment and that it lacks scope for creativity and originality. On the other hand, industry is likely to attract undergraduates seeking success in the form of either responsibility or financial rewards.

The survey showed that 54 per cent of the sample of undergraduates were considering careers in industry—42 per cent of the arts students and 66 per cent of the scientists. These undergraduates expect to earn about £2,900 by the age of thirty, compared with £2,200 for those not considering industry. According to the findings of the survey, scientists generally consider that they will earn more than arts students. A particularly disturbing finding is that 27 per cent of the sample said that they were considering permanent emigration, and this figure includes 31 per cent of those considering a career in industry and 30 per cent of the scientists.

What can be done to make industry more attractive and to dispel some of these misconceptions? The Cambridge group suggests that these beliefs may have arisen partly from experience of menial vacation jobs and from unfavourable impressions from recent graduates now working in industry. Many firms do not know what to do with graduates, and the repercussions of this, in terms of both the possible disillusionment of the graduate concerned and the feedback to future graduates, are "too serious to be ignored". The survey suggests that industry should provide more vacation jobs which directly relate to the everyday industrial problems a recent graduate would expect to face. In particular, undergraduates should be given research-type projects in the fields of marketing and sales, finance, management services, production and personnel, to bring them into contact with existing company staff and to provide a true picture of the business environment. Such vacation jobs, the survey suggests, can be of definite use to the company concerned and would cost about £150 per person, which compares favourably with the average cost of £650 to recruit a graduate.

COUNTRYSIDE

Fearful but Cheerful

by our Planning Correspondent

THE Countryside Commission in its second annual report (HMSO, 10s) complains of continued threats to amenity in the ten National Parks in England and Wales. It singles out military training on Dartmoor and the prospect of two new reservoirs in the park when there are feasible alternatives outside the area. In the

North York Moors Park, one application to mine potash has already been approved, and the commission fears that two further applications could be successful. It is plain, it says, that considerations of amenity in the parks do not enjoy the priority in public policy that was intended by the National Parks and Access to the Countryside Act of 1949.

In other ways, the commission is more cheerful. It says that it hopes shortly to make recommendations to the government for the protection of more than 2,000 miles of unspoiled or little-spoilt coastline in England and Wales. The first National Park Centre for day visitors, Brockhole on the shores of Windermere, was opened to the public on June 26 and by the end of September it had received 55,000 visitors, which the commission judges to be a success.

With a view to improving the cooperation between hill farmers and the park authorities, the commission is carrying out experiments in the Lake District and in Snowdonia in which the farmers get paid for work they do in improving the appearance of their farms and in providing simple facilities for public access.

On May 24, the second long-distance footpath, the Cleveland Way, which runs for 100 miles across the moors and coast in Yorkshire, was formally opened. There are now nearly 350 miles of continuous footpaths open, and the commission is negotiating rights of way on several other paths that have been approved. All national long-distance paths will be way-marked by the symbol of an acorn.

The commission is pleased with the response of local authorities and some private owners to the Countryside Act of 1968. Eight country parks and seven picnic sites have been recommended for grant aid and have already received approval from the Ministry of Housing and Local Government, and ten other parks and thirteen picnic sites have been accepted in principle by the commission. No new areas of outstanding natural beauty were designated during the year under review, but designation orders are being made for submission to the minister during the next few months. In the National Parks, projects were hampered by restricted Exchequer grants, but there was progress in such matters as nature trails and the provision of car parks, and three more information centres were set up.

COMPUTERS

More Computer-aided Design

TECHNIQUES of design by computer are not being applied as fast as they should be, either here or in the United States, but, if the Ministry of Technology adopts the recommendations made by the Computer-aided Design Committee in its second annual report, considerable progress should be made within the next two years. In making its recommendations the committee was particularly concerned to ensure that there should be a major reduction in the cost of applying the new techniques and that all the resources available to develop the techniques should be brought closer together. The committee gives particular attention to the problems of information collection and retrieval.

The main proposal the committee makes is that the government's protégé, International Computers Ltd, should be "induced" to take overall design authority for a workable design system in line with its present programme of computer development. This would

include the supervision of the interfacing of graphic display systems and the provision of software for them, and would be an extension of ICL's work in managing the CAD Centre at Cambridge, suggested by the committee's first annual report. Mr A. I. Llewellyn from the Ministry of Technology becomes the first director of the centre on January 12.

The idea is that the Atlas computer at the centre should hold in its store a collection of blueprints for the designing, for instance, of turbo machinery or process plant equipment, the relevant structural engineering rules, and data on various types of materials which might be incorporated. These would be made available to many users in their own design offices by means of graphical display links. The committee suggested that the Post Office should be asked to provide better transmission lines for graphic displays. The committee also suggested that the Ministry of Technology should encourage companies such as Marconi, Elliott, Ferranti and Plessey to rationalize their manufacture of these display systems and also the software for them. To get industry involved as quickly as possible, the ministry should offer to lend up to six graphic terminals with the necessary software to potential users, and centres should be set up to demonstrate the systems and to train operators.

The report, with its recommendations for the extension of CAD facilities, comes at the end of a good year for British computer manufacturers. Following the merger with English Electric last year, ICL has raised its combined profit by 25 per cent—from £3.9 million last year to £5.8 million this year. The GEC-Elliott Automation company has also won £1 million worth of orders from the German Democratic Republic. Three ARCH computers have been successfully commissioned at the Schwedt petrochemical complex and there are two new orders from Vickers-Zimmer for Schwedt and a new plant at Premnitz.

ENGINEERING

First MacRobert Award

THE first MacRobert award, worth £25,000, is to be divided between teams from Freeman Fox and Partners and Rolls-Royce Ltd for the design of the Severn Bridge superstructure and for the Pegasus vectored thrust engine respectively. The MacRobert award is for outstanding innovations in the field of engineering or the application of physical science which "have enhanced, or will enhance, the national prestige and prosperity of Great Britain". The MacRobert trustees hope that it will provide a balance, at least in Britain, for the Nobel prizes.

The Freeman Fox team, directed by Sir Gilbert Roberts and including Dr W. C. Brown, Mr M. F. Parsons, Mr C. D. Crosthwaite and Dr T. A. Wyatt, was responsible for designing a novel superstructure for the Severn Bridge which saves about 25 per cent in cost compared with the conventional truss type of bridge. The new features include the shallow streamlined hollow box section of the deck, the construction of the towers and the sloping hangars. The use of a single box girder wide enough for its top to form the bridge deck was attractive both economically and aesthetically, although at the time no all-welded box bridge structure of anything like the size required had been made. It has the advantages of lightness, a