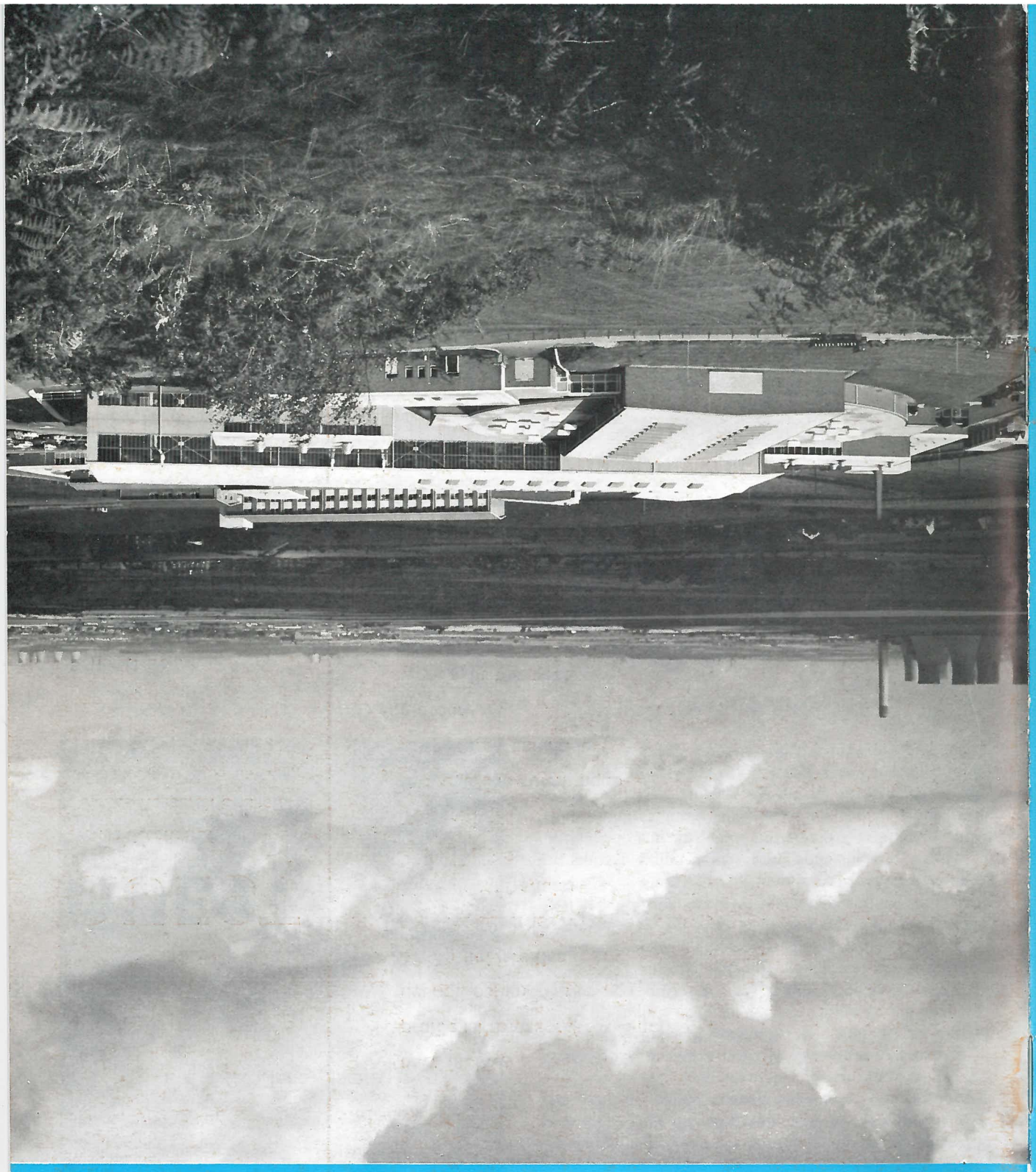

QUEST

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QUEST

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contents

Cover picture shows the Daresbury Nuclear Physics Laboratory whose Director appears in 'profile' in this issue. The plan on facing page shows the layout of the buildings.
Not yet in the photograph but indicated on the plan is the site of the new Synchrotron Radiation Facility which is described on page 1.

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new synchrotron radiation facility

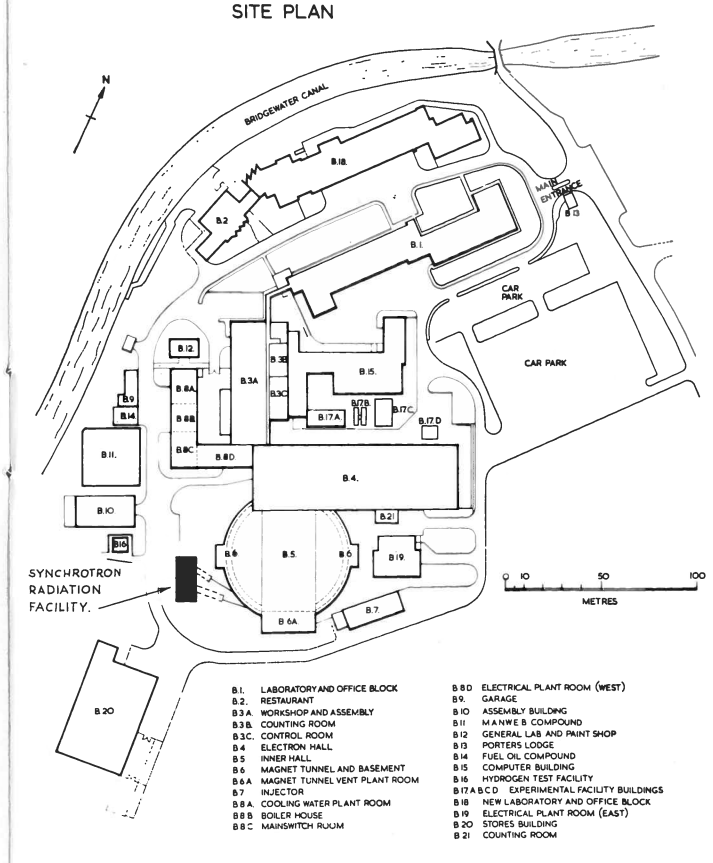
The properties of radiation emitted when electrons are accelerated at high energies are such that they represent a unique light source which can be very valuable for spectroscopic research.

In order to make use of such a source, the Science Research Council has allocated £360,000 over five years to set up and run a Synchrotron Radiation Facility associated with the 5 GeV electron synchrotron (Nina) at the Daresbury Nuclear Physics Laboratory. The new Facility which is expected to be completed and operational in mid-1972 will provide scientists from universities and other research laboratories with a service available nationally.

At the present time research is being carried out with a number of electron synchrotrons throughout the world using the ultra-violet light radiated from the electron orbit. In the UK studies have been made during recent years which have confirmed the potential value for future spectroscopic work of the synchrotron light from the Daresbury accelerator.

Professor Alick Ashmore, Director of the Daresbury Nuclear Physics Laboratory, whose 'Profile' appears on page 2.

DARESBURY LABORATORY
SITE PLAN



The national Facility which the Council is now setting up, will allow several independent experiments to be undertaken simultaneously. It has also been designed, so that, once established, it will operate without interfering with the main users of the synchrotron. Time on the Facility will be allocated by a panel of scientists, expert in the field.

Already much interest has been expressed by university departments who are planning experiments.

New information on topics ranging from the study of inner electrons of isolated atoms to the study of biological specimens may be expected and additional research activities in the fields of physical chemistry or X-ray crystallography undertaken. In this way, a great deal of exciting scientific activity will be pursued based on the vast amount of electromagnetic radiation emitted from electron synchrotrons – energy which would otherwise simply be wasted.

Dr. Geoffrey Marr and Dr. Ian Munroe published an article about the Facility in *New Scientist* Feb. 4, 1971. Dr. Munroe is user coordinator of the Facility at Daresbury and a Lecturer in Physics at Manchester University. Dr. Marr is a Reader in Physics at Reading University.

profile

Professor Alick Ashmore

Director of the Daresbury Nuclear Physics Laboratory

Nuclear Physics is a twentieth century science which has grown enormously since Rutherford, using very simple apparatus, first observed a nuclear reaction in 1919. Rutherford—Chadwick—Liverpool—Rutherford Laboratory—Daresbury—CERN are all names in the chain which links nuclear physicists both nationally and internationally in close associaton. The remarkable results achieved at Liverpool in the late 1950's on Chadwick's Synchrocyclotron gave the incentive that led to the building of the 5 GeV electron synchrotron at Daresbury to provide a powerful facility for the northern universities. Chadwick was associated with the Daresbury project by the Laboratory's first Director Professor Merrison.

So it was appropriate to choose as the next Director Professor Alick Ashmore, a Liverpool PhD and Lecturer who had been part of the research team which produced the results of the 50's and had earlier worked on the original small cyclotron at Liverpool. On the new accelerator the first spin correlation measurements were made on the nucleon-nucleon interaction. Interesting work was carried out on muon catalysed fusion – inducing fusion reactions between hydrogen and deuterium nuclei by absorbing negative muons into atomic orbits to form muonic molecules. Because of the small orbit of the muons the two nuclei are brought close enough to fuse. Although the rate of fusion was insufficient to form the basis for economic power generation, there was interest in this possibility and he wrote some articles for engineering journals and was consulted by the Atomic Energy Authority. Some results of his work at Liverpool were published in the Proceedings of the Physical Society in his papers on 'The γ-rays from muon catalysed fusion of Hydrogen and Deuterium' (1958), 'Spin-Correlation measurements in p-p scattering at 382 and 320 MeV' (1961). He gained a PhD in 1958 and became a Fellow of the Institute of Physics in the following year.

Professor Ashmore originally graduated in Physics at Kings College London (also Professor Merrison's College), in 1941, then spent the next few years on war effort as an Experimental Officer at the Radar Research and Development Establishment, Malvern, developing radio proximity fuses and aerials for radar equipment based on Watson-Watt's pre-war work. Watson-Watt had taken out patents on his methods of following aircraft by radio wave reflections as early as 1935 and given Great Britain a world lead. This was kept up by the research teams at Malvern which included such well known names as Cockcroft, Dee, Lovell, Pippard, Runcorn and Farley. The level of the work was therefore very high and it was an excellent introduction to applied science.

Afterwards though, like many of the others, he preferred to return to academic life. Being about to get married he applied for a salaried appointment as an assistant lecturer in Physics at the University of Liverpool where he stayed for twelve years, until 1959, as a lecturer and senior lecturer. He has taught most subjects in physics although his main interests lie in high energy physics and in the education of physicists. His wife too teaches physics and mathematics, in schools, though only part-time as there are five children in the family, not one of whom has so far chosen to specialise in physics. Two are at university reading biology – a son (20) at East Anglia and a daughter (19) at York. His next daughter is in the sixth form at Lymm Grammar School and also there are twins of 15, a boy and a girl.

For the first few years at Liverpool he was heavily involved in teaching and only slowly built up a research programme on the small cyclotron. The building of the new accelerator provided a golden opportunity to do more research. By 1959 he was thinking about moving on to work on the proton accelerator at Rutherford Laboratory, under Dr. Pickavance, or the 28 GeV alternating gradient synchrotron at CERN, when an appointment as Reader in Experimental Physics came up at Queen Mary College London. He got the post along with the chance to start his own nuclear physics group, and the opportunity to work at both the Rutherford and CERN laboratories and, later, in the USA. The group has grown and now has a professor, a reader, three lecturers, three research fellows, supporting staff and students. He continued his Liverpool work on the nucleon-nucleon interaction on the proton linear accelerator and later on the 7 GeV proton synchrotron 'Nimrod' (operating from 1963) at Rutherford Laboratory. In 1965–6 he was a Visiting Physicist at the Brookhaven National Laboratory, USA, which has a proton synchrotron similar to the one at CERN. Publications include papers on total cross sections for high-energy protons at CERN (Physical Review Letters 1960), wide-angle pion, kaon and antiproton scattering at Brookhaven (Physical Review 1969) and 'measurements of A and R parameters in p-p scattering' at Rutherford Laboratory (Nuclear Physics 1965). He was appointed Professor of Nuclear Physics at Queen Mary College in 1964 and Head of the Physics Department in 1968. Meanwhile he also became a member of the SRC Nuclear Physics Board, the Nuclear Physics Laboratories Committee and the Film Analysis Grants Committee. So when invited to become Director of the Daresbury Laboratory he knew quite a lot about the organisation of nuclear physics under SRC as well as having firsthand experience of research at the 'receiving end'.

As Director at Daresbury he is chairman of the Selection Committee which sees that the Laboratory's experimental programme is well launched on good lines. He also maintains informal contact with all the physics that is going on and is getting to know more about the facets of the Laboratory outside his own field, such as accelerator and applied physics, computing and electronics. He does not yet foresee having enough time to take part in a high energy experiment on the synchrotron, because this requires a certain amount of time spent on it, below which, he says, you are not much of an asset to the team.

He has a particular interest in the Theory Group, run by Professor Donnachie and he regularly attends the Friday 'coffee mornings' for high energy experimentalists and theorists which are lively generators of ideas and enthusiasm. Maintaining good contact with the user universities is very important to the Laboratory. Since his arrival last year he has contributed by giving lectures at Liverpool, where he is a Visiting Professor, to the Physical Society at Aberystwyth and to the Midland Branch of the Institute of Physics in Birmingham. It is his intention to continue and extend these contacts with the universities.

To relax he enjoys camping holidays with his family in Europe and at present they are working on the house they have bought at Lymm to add improvements planned by his wife.

The Laboratory itself has a family atmosphere. Being a specialised laboratory everyone on the staff of 500 brings their special skills, as pure or applied physicists, engineers, craftsmen or technicians and so on, towards a common end. It also benefits from the outside experience of the visiting research teams. At universities, for instance, there is usually a wide range of physics subjects and interaction between them and with other disciplines. The Laboratory has been well planned and set up and has a good spirit and the new Director intends that it should continue that way.

council commentary

£1M A YEAR FOR ATOMS MOLECULES AND PLASMAS ++ BEST DATA YET FROM SKYLARK SPACE FROBE IN SOLAR ULTRA-VIOLET SPECTRUM ++ SYMPOSIUM ON ELECTRON AND PHOTO INTERACT ++ £59,000 HARDWARE FOR MULTI ACCESS COMPUTER SYSTEM ++ BRITISH EXPERIMENT IN OR ING SOLAR OBSERVATORY ++ ++ FIRST LUNAR SAMPLES FOR BRITAIN ARRIVE AT SRC ++ FOR CONTROL ENGINEERING RESEARCH ++ ANGLO-AUSTRALIAN TELESCOPE CONSIDERABLE CONTI BUTION TOWARDS SCIENTIFIC DISCOVERT ++ RSRS PARTICIPATES IN UK4 SATELLITE TO MEA INTENSITIES OF ELECTROMAGNETIC RADIATION ++ DEVELOPMENT IN ANALYSIS OF BUBBLE CH BER PHOTOGRAPHS BY SWEEPNIK AIDED BY SRC GRANT OF £40,473 ++ SUCCESSFUL LAUNCH O

december

As recorded in the last edition of *Quest*, at the end of last year Mrs. Margaret Thatcher the Secretary of State for Education and Science announced in Parliament the decision that the UK would participate in the revised proposal to build the 300 GeV accelerator near the existing CERN site at Geneva. The decision was made on the recommendation of the SRC and at the December meeting Council members were particularly pleased to hear that UK participation was possible. All other members of CERN, with the exception of Greece and Denmark who have not yet decided, have since agreed to contribute so the project can at last go ahead.

Also at the December meeting, the Council was told of the Working Party set up by the Council for Scientific Policy to consider the arrangements for the support of civil research in the UK. Further information about this Working Party was given in the SRC Circular 5/71 of 27 January 1971.

One of the main items on the Agenda for the December Council meeting was that of student training awards for 1971. Council decided to seek authority to make 3,850 awards, an increase of about 120 over last year. The additional awards will mainly be for research and advanced course studentships in engineering and for the special scheme of broader-based training being financed jointly by SRC and the Social Science Research Council. This scheme gives postgraduate students the opportunity to undertake research which crosses the borders between science and social science.

Several large and important grants were approved by Council including the 1971 consolidated grant for Sir Bernard Lovell's programme of radio astronomy and a supplementary grant for repairs and modifications to the 250 ft. radio telescope at Jodrell Bank. The detailed design phase of a joint US/UK programme for a small astronomical satellite was

approved, as were grants totalling up to £71,000 to Oxford and Heriot Watt Universities for handling and analysis of data from their experiment to be flown in the US Nimbus-E Satellite. Council approved a grant of up to £125,000 to Professor T. Weis-Fogh at Cambridge for work aimed at the development and application of methods for the preservation of soft highly hydrated biological tissues and an award of up to £115,000 for the purchase of a multi-access computer for analysis of data from a wide range of experiments using the 3 MeV Dynamitron linear accelerator provided earlier by SRC for the joint use of Birmingham and Aston Universities. Council also approved the 1971 grants for the main University Nuclear Physics teams for continuation of their film analysis and nuclear structure research.

january

Council agreed that the SRC Forward Look should be prepared on the basis of an 11% growth over the three years up to 1974-5 with a somewhat higher growth rate for the following two years. The detailed Forward Look will be presented to Council in April when the growth rates for each of the four Boards will be decided.

Arising from this preliminary discussion of the Forward Look and in particular of the forecasts of computing facilities for the coming five years for the Atlas Laboratory and other SRC Establishments, Council asked for a full review of the likely requirements and of the best way of meeting these needs.

Of increasing importance for research in several branches of science is the provision of high flux neutron beams and the largest item to be considered for possible inclusion in the Forward Look will be the High Flux Beam Reactor (HFBR). The HFBR has been included in plans for a long time as a joint project with AEA, but is now being considered solely as an SRC proposal and, as at present envisaged, could cost about £20 million. The project was last considered by Council in May 1970 when it was decided to prepare a costed programme of the work necessary to complete a design study and a detailed specification. Dr. Leo Hobbis of the Rutherford Laboratory, who is the project leader, presented the results of his study to Council in January. Council accepted his report but deferred a decision on the project until the April meeting, when it could be considered in relation to the other proposals in the Forward Look. In the meantime, further study of some aspects of neutron beam research will be made; for example, the possibility of European collaboration and the plans of other bodies for work in this area.

Amongst the grants approved in January was an award of up to £31,000 supplementing an earlier award of £97,000 to Professor A. M. Uttley at Sussex University for continuation of his research in pattern recognition, based on adaptive electronic networks. Council recommended continuation of the UK-5 satellite project at an estimated cost of just over £3 million. The UK-5 is the most sophisticated scientific satellite to be built by the UK and will carry an American experiment. Council also approved expenditure of up to £61,500 on two magnetic tape deck clusters for the ICL 1906A computer at the Atlas Computer Laboratory.

february

The Secretary of State for Education and Science, Mrs. Margaret Thatcher, accepted Council's invitation to attend the February meeting. In the discussion of the Council's programme, Mrs. Thatcher stressed the special role of the SRC in supporting fundamental research. She also showed particular interest in the balance between postgraduate training and research activities and in the reasons for supporting research in the applied sciences.

In preparation for the Forward Look in April, Council was to review the programme of its four Boards and the main item on the Agenda for the February meeting was a discussion of the policies and programmes of the Science and Engineering Boards. The Science Board's presentation to Council makes it clear that the principal motive for most of the work which the Board supports is the drive to achieve a deeper understanding of man and his surroundings. Much of this fundamental knowledge is essential for the development of new technologies which if widely used can be of benefit, but the chief criterion for selecting what shall be given support must always be the likelihood that the imagination, skill and drive of the individual will lead to this deeper understanding. The Board's review of its training policy similarly lays stress on the importance of postgraduate education that will develop the intellectual ability and personality of the student through undertaking challenging work in science.

The review of the Engineering Board's programme outlined the progress made since the Board's inception in 1969 in determining the criteria for support in engineering and in concentrating effort into viable groups. In addition the Board is paying particular attention to postgraduate training which at present influences students to take up careers in research whereas there is need for a greater proportion of the most able students in such areas as design, production, project management and technical marketing.

at the universities

interactive graphics

A grant was made to continue and extend earlier work supported by SRC in the application of advanced computer techniques to design problems in electrical and electronic engineering. The Department of Computer Science at Edinburgh University receives £314,986 for a four year programme for 'Interactive Graphics applied to Electronic Design'.

Much of the work is fundamental in character but many aspects are of interest to industry (close co-operation is maintained) and should lead eventually to the discovery of novel design techniques and new methods of problem solving as well as advances in the efficiency of man-machine interactions.

The grant provides for a PDP-10 computer made by the Digital Equipment Company. The configuration provided will allow simultaneous access by eight users. Used in conjunction with the existing PDP-7 system, which contains a cathode ray tube, it will be possible to exploit the PDP-10's rapidity and accuracy combined with the experience and insight of a human designer. This approach has already proved promising in the design of printed circuit wiring boards. Other applications include the analysis and display of the flow of power in electricity distribution networks and the design of electronic filters for particularly exacting requirements.

boost for electrochemistry

A working party was set up in 1968 to examine the field of electrochemistry and to determine areas in which further research would be most likely to give benefit to industry. It was felt that many industrial processes then based on a rather empirical approach would benefit by research aimed at establishing them on a firm scientific basis.

Applications for support were invited and four grants have just been announced to the Universities of Bristol, City of London, Newcastle and Southampton.

Dr. R. Parsons of Bristol is to receive £26,239 over 3 years for research on electrocatalysis and the mechanism of electrode reactions.

Professor D. J. Alner, City of London, gets £13,575 for research in electrodeposition and related phenomena, electrocatalysis and electrode structures.

Professors J. M. Coulson and H. R. Thirsk and Dr. A. K. Corington of Newcastle will receive £58,039 for research in electrolytic process engineering, electrochemical plating of noble metals, electrochemical kinetics of certain transition metals, and effect of non-aqueous organic solvents on gas electrodes.

Professor M. Fleishman of Southampton receives £48,567 for research on electrode processes, electrosynthesis and reflectance spectroscopy of electrode surfaces.

chemical analysis

'Chemistry – a review of the policies and activities of the Chemistry Committee' was published in February. It included a survey of the current state of research in chemistry, short accounts of some of the work carried out with the help of SRC funds, discussion on current trends and the views of the Committee on the likely pattern for future support.

The various forms of training available to chemists were reviewed and, from an analysis of recent employment statistics, the Committee estimated the number of PhDs likely to be required in the various sectors five years from now and looked at the appropriateness of available training methods. The Chemistry PhD output rose by 35% between 1967 and 1969 but the Committee expects it will now flatten off and remain around a total of 850 for the next few years.

This is significantly greater than the number required for research and teaching in Chemistry but the Committee believes that the training is suitable for a wide range of careers and that about a quarter of Chemistry PhDs will work outside the research and development field. They are looking for a somewhat broader training for the majority who will work in R and D and a much broader training, built around a core of Chemistry, for those who will take up other types of employment.

The report is being widely circulated throughout the Scientific community as well as to Chemists under the SRC's practice of making its policies widely known and inviting comments before final decisions are made.

the first superheavy?

Early in February evidence was produced for the possible existence of a superheavy element with atomic number 112. The heaviest naturally occurring element is uranium (atomic number 92) and the previous heaviest artificial element was hahnium (atomic number 105).

A Rutherford Laboratory team led by Dr. C. F. Batty in conjunction with researchers from the chemistry department of Manchester University and the Universities Research Reactor, have been working for some time on an idea suggested by Dr. A. Marinov (a member of the Rutherford Laboratory team on leave from the Hebrew University, Jerusalem), that the super heavy elements might be produced by bombarding tungsten targets with fast protons. The collision of a fast proton with the tungsten atom may produce very energetic tungsten nuclei which if they collide with the other tungsten atoms may possibly produce super heavy nuclei.

Accordingly, tungsten targets that had been used in the 28GeV CERN accelerator were obtained and since it had been predicted that element 112 would have similar chemical properties to mercury, chemical samples were prepared using mercury as a carrier. Measurements made of the alpha particle energies, the spontaneous fission and the estimated upper limit half-life of 500 years are all in good agreement with the values expected for element 112.

The team is working to confirm the existence of this new element and at the same time to search for others which may have been produced in the tungsten targets. A full report of this work was published in *Nature* on 12 February (229, 464 : 1971) a Science Report in *The Times* on 12 February and in *New Scientist* on 18 February.

high current affairs

The Rutherford Laboratory has been engaged for several years in preparatory studies of a high field bubble chamber. This chamber incorporates a number of advanced ideas, not the least being a 70 kilogauss super conducting magnet. In order to assess the performance of the conductor developed for this project a super conducting magnet known as Racoon II has been constructed and tested. Operating fully immersed in liquid helium Racoon II was energised with currents up to 14,800 amps and reached a peak magnetic field of 66 kG. This is believed to be the highest current at which a superconducting coil has yet operated. The peak current density achieved is ten to twenty up on conventional water cooled magnets wound with copper conductors. Racoon II uses about 100 metres of stabilised superconducting strip wound into six double pancake coils each of about 25 turns. The conductor consists of 361 niobium-titanium filaments each 0.3mm in diameter. The filaments are embedded in a copper matrix of cross-section 25mm by 6mm and twisted about the longitudinal axis of the conductor with a pitch of 50cm.

The second stage of the test programme is aimed at proving that the superconducting strip will also carry its design current of 7,500 amps in a magnetic field of 84 kG. For this test Racoon II will be mounted within the bore of a 50 kG water cooled magnet at the Royal Radar Establishment at Malvern. When both coils are energised simultaneously it is expected that peak fields in excess of 84 kG will be generated.

nutcracker no. 3 — grants

The Astronomical Analysis Committee has long treasured a blithe disregard for the demands of selectivity and concentration. At its last meeting it was faced with the following applications:

University of Llanfyllin: £10,000, £5,000, £3,000, £3,000, £2,000, £1,000.
East Barking Technical College: £8,000, £7,000, £4,000, £2,000, £2,000.
Louseburn University of Technology: £10,000, £6,000 £6,000, £3,000, £1,000, £1,000, £1,000.
Wessex Free University Commune: £9,000, £5,000, £4,000, £2,000.

In a spirit of absolute fairness, the Committee rejected six applications, chosen at random in such a way that no institution had more than two rejected, and awarded each of the remainder three-quarters of the sum requested. In this way they allocated £54,000, without any institution receiving less than half its total sum requested. Furthermore their final totals followed the same order as their total sums applied for. The two £5,000 applications, being from Committee members, naturally received awards. How much did each institution receive?

Your local correspondent holds the answer this time. Find his/her name on the list inside the front cover.

telecom '71

SRC has a stand in the British Pavilion at the Second Symposium on Space and Radio Communications which is being run by the International Telecommunications Union (ITU) in Geneva from June 17 to 27. The other stand will be produced by the Post Office. SRC's stand will include a general idea of the Science Research Council's work and its interests in radio astronomy and space science. Jodrell Bank and the proposed new 5KM Cambridge telescope will be featured under radio astronomy, space science will include a display from the Mullard Space Science Laboratory and, if available, a prototype of their extreme ultraviolet polychromator, the flight model of which is now in orbit in OSO–6. The Radio and Space Research Station will feature their work on radio wave propagation research. The stand is designed and produced by the Central Office of Information under the sponsorship of the Department of Trade and Industry.

The United Kingdom celebrates the centenary of its membership of the ITU this year. The ITU was founded as the International Telegraphic Union in 1865 by 20 European countries following negotiations for a uniform international telegraph system. The United Kingdom was not invited to the negotiations because the operation of our wire telegraph systems (at that time the only telecommunications service) was still in the hands of private companies, including the railways. Later when these were taken over by the Government, following the Telegraph Act of 1868, and the United Kingdom was able to accept and apply the regulations and other provisions of the International Telegraph Convention we became a member of the ITU on Febraury 24, 1871. During those 100 years, telecommunications have evolved into all the highly developed techniques of telegraph, telex, telephone, radio and television which can transmit information rapidly all over the earth and into outer space.

la recherche scientifique

John Walsh

I believe that people who are in favour of Britain's entry into the Common Market are, approximately, those who *like* Europe; and further, I think that what they like about it are its differences from Britain. It is ironical (and a pity) that if we do go into the EEC, these very differences will be eroded by economic and ultimately political union. For the moment, though, the differences exist, and last year I spent two periods with SRC's sister organisation in France— le Centre National de la Recherche Scientifique (CNRS) — trying to spot any differences between us that might stand in the way of formal collaboration in research.

There is already considerable Franco-British co-operation in scientific research at the informal level between individuals, at the national level in organisations such as CERN, and at an intermediate level between numbers of laboratories and groups of research workers. Examples of the last type are the Council's recent decisions to investigate participating in the work of the Franco-German von Laue-Langevin Institute and the CNRS high magnetic field laboratory at Grenoble. If for no other reason than that some types of research are so expensive, it seems certain that European (including British) co-operation in this area must continue to grow, whether or not we join 'the six'.

The differences between SRC and CNRS are, on the face of it, extensive. In terms of scientific disciplines covered, CNRS equates to SRC, SSRC and NERC, and supports also some areas such as literature and history that in Britain seem to get along without a Research Council watching over them. An important exception is that CNRS has no equivalent to our Engineering Board and its Committees. This gap stems from the traditional separation, in French education, of the pure and applied sciences, and probably makes the commercial exploitation of research results even more difficult than it usually is.

The next most striking difference is of physical size: there are about 125 laboratories and study centres throughout France that belong to CNRS. There are about 16,000 permanent CNRS employees, who include some 6,300 research scientists. Some laboratories are grouped into CNRS 'campuses', and I visited the groups at Marseille and Gif-sur-Yvette. Each of these groups is large enough to have its own administrative and central services function, and these may form the basis for a regionalised administration that it is hoped to introduce over the next few

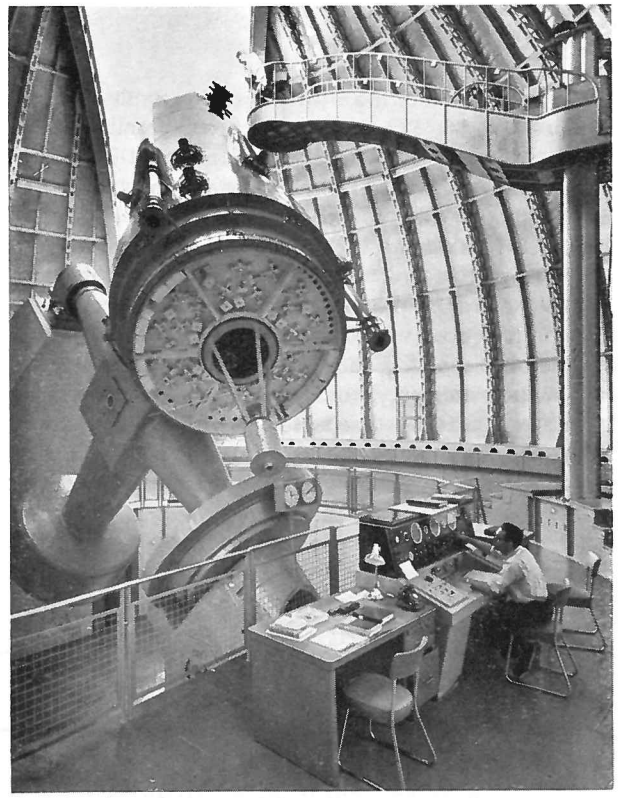
la recherche scientifique continued

years as an antidote to some of the problems arising because of the large scale of CNRS activities.

Anyone familiar with the 'management style' of large European firms would not find anything surprising about the way CNRS is organised and run. The set-up approximates to what Max Weber called a 'rational-legal bureaucracy'. What this means is that there are clear rules governing how most things should be done. The result is what seems to the British eye a fairly cumbersome machine, as is evidenced by the pejorative connotation that 'bureaucracy' has assumed in English. This sort of system tends to have a lot of paperwork associated with it: the members of SRC Committees who complain about the weight of papers they have to read before meetings have little to grumble about on a comparative basis – CNRS sends out its papers in special returnable boxes because they are too heavy to expect people to carry with them back to Paris! But the big advantage of the formalised system of working is that the decision-making process is clearly laid down and known about. Problems are expected to be soluble, and there is none of that wooliness in the reception of a new idea that, in Britain, can smother it at birth.

There are two very important qualifications of this description of how CNRS is run. The first is that with 'number-crunching' facilities on tap, formalised working systems are ideal: they are ready-made for the computer, which will make short work of the tasks they generate. Second, CNRS has, since the 'events' of May 1968 (when the pressures for social changes erupted throughout France), introduced a democratisation of its procedures; for example, half the membership of its Committees is elected by research workers and University teachers, and there are Laboratory Councils in all establishments. I saw examples of both these aspects in the Committee elections of autumn, 1970. The total electorate was 44,000, electing 370 people from a list many times that size, to 34 different committees. The rules to govern the elections and to ensure their fairness resulted in a task of nightmare size and complexity, bearing in mind that it is an ancillary and only occasional operation. But the rules were easily transcribed into a program, and the CNRS central computer quickly finished what would probably not have been completed yet if done manually.

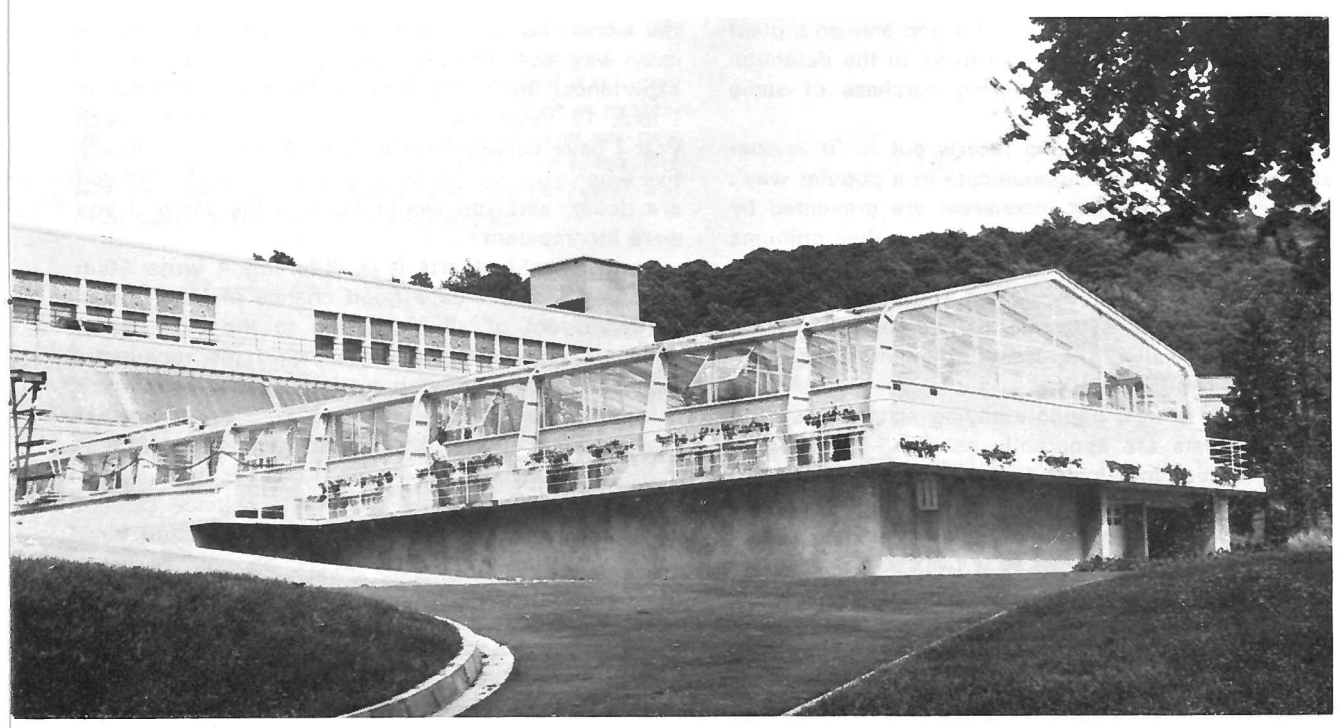
Within these overall differences of method and context between CNRS and SRC there were numerous smaller ones. For instance, as well as its own establishments, CNRS supports a large number of 'associated' laboratories. But I concluded that there were no great differences in principle or in practice that would hinder our collaboration. Indeed, the problems that each organisation sees facing it – like the need for the selective use of scarce funds – were remarkably similar.



The 193cm Telescope at the CNRS Observatory at Haute-Provence. Original techniques have been developed at the Observatory and used in the study of galactic rotation and interstellar hydrogen clouds.

My visits to France have been reciprocated by the visit here in January of Mr. J. F. Zahn of CNRS. During his stay, he saw something of the work of London Office, RGO, Rutherford, Atlas and a University, and I think that he, too, would have been as struck by the similarities between us as by our differences. The twin visits have provided an interesting comparative study of organisations that reflect a microcosm of national differences. But since I don't think that any colossal difficulties will arise in our future co-operation with CNRS, we can afford to say 'vive la différence'!

John Walsh is Head of the Training Section at London Office.



The super-greenhouse at the CNRS Phytrotron Laboratory at Gif-sur-Yvette, near Paris. Here, the germination and growth of plants are studied in an environment that can be altered to suit the research. It is possible to simulate any climatic condition by varying sunlight dosage, temperature, humidity, luminosity and even wind force. The problem of soil variability is overcome by growing the plants in glass fibre automatically 'watered' with a nutrient solution. The photographs are reproduced by courtesy of CNRS.

tongue tied scientists

Does the influence of the mass media affect even our choice of career? The following article is written by the senior science master of Sherrardswood School, Welwyn, and is reproduced from the Times Educational Supplement by kind permission.

Tony Rook

Something must be wrong with science. If all was well, we would not read reports and articles which tell us that too few teachers are teaching better and better science to fewer and fewer pupils. The reasons for the so-called swing away from science are complex.

In many cases the decision to 'drop' physical sciences is made by 14-year-olds, whose motives are difficult to analyse. New syllabuses, teaching methods and examination requirements are suggested and tried; perhaps it would be better if someone were to attempt an analysis, if only as a sort of Aunt Sally, of the various pressures working on the pupil.

The most obvious difference between the 'arts' and the 'sciences' lies in the field of public relations. Any educated person could, for example, write a play for television. The qualifications to become a disc jockey or a pop star are not of the same sort as those required to become a scientist.

If we examine the output of the BBC, bearing in mind that we live in a technological age, in which most of us are, in some way or another, involved with the progress of science, we discover an infinitesimal fraction concerned with science, scientists, or the excitement and mental stimulation of research. *Tomorrow's World* stands alone, yet its compere is not a qualified scientist, and the team producing the programme cannot distinguish between heat and temperature. There is no peak programme concerned directly with science.

Why is this? Partly because television is looked upon as one of 'the arts'. Anyone involved with the arts is supremely confident of his own importance. When he runs out of material he will be quite capable of inventing a programme where he and his cronies get together in a self-congratulatory clique. If you are in mass communications, you don't just provide

the information. The opinion of a pop star on a great moral issue is second only as news to the detention of a reporter or the impending purchase of some second-rate newspaper.

In science, as Desmond Morris put it, 'it is considered bad form to communicate in a popular way'. Scientists who are not incoherent are prevented by their group taboos from communicating their opinions directly to the public, and at best may condescend to being interviewed by James Burke. A friend of mine was blackballed from a learned society because he was a journalist. This is not a new attitude; H. G. Wells had similar trouble.

At an early age, pupils studying science discover that scientists are apparently ashamed to admit to their own actions. Instead, they write in 'the third person obscure'. What pupil can take pride in his work if he has to write an account ending 'it was found that' when he wants to write 'I just discovered . . .'? I once referred a paper on particle size analysis which contained the statement: 'The second experiment was performed using a different sample of the powder . . .'

I phoned the author and asked him why he did not explain this. He told me: 'The lab. assistant dropped the whole bloody lot on the floor, but I can't think how to explain that in the right sort of language!' Until scientists are prepared to communicate with one another in ordinary English, and with the rest of the world enthusiastically, they cannot compete with the arts men.

Another fault of science lies in its chromium plated image. After a dip into scientific journalism it is difficult to imagine that anyone could do worthwhile work without half a million dollars worth of hardware and a computer terminal in his living room. The exhibit which depressed my pupils most at a recent Physical Society exhibition, where everything was measured in £ x 10^n consisted of banks of photocells and an on-line computer discovering how goldfish moved in a tank.

What has become of the educated Victorians who seem to be scattered among my forebears and those of my friends – the people from whom we inherited the microscope, telescope and box of minerals which seem to have become part of the furniture? Who now publishes their sort of books: *Evenings at the Microscope, Scientific Recreations,* and so on? Books may be better produced nowadays, but they produce a glossy vicarious look at computers, space rockets, and atom smashers. Science is not fun for the individual any more, it is big business for the corporations.

With the chromium plated image we have the computerised reward. Top management, The Establishment, are not scientists, and scientist-managers are getting rarer. Since the boss cannot understand the worker he cannot assess his value, and takes the easy way out. He pays him for qualifications and experience. My salary depends upon an examination I took 12 years ago, plus a small reward for each year I have survived since then. Where is the incentive when your employer cannot understand what you are doing, and you would be paid the same if you were incompetent?

In the world of arts it is different. A writer, film star, pop star stands a good chance of being given a reward out of all proportion to the work done, which is completely independent of the recipient's past academic history. It is ironical that people are driven to the creative arts, not as a revolt against the materialistic world, but in an attempt to exploit it.

As a teacher I would say that a science student should have the following abilities: he should have excellent powers of observation, be able to write clear concise English, be able to draw well, be able to think logically, and be able to learn a new vocabulary; he must also have dexterity in handling apparatus, and should ideally have basic skills in metalwork and woodwork. In addition, he must be a mathematician.

I am sure it is possible to do well in an arts course with only a few of these accomplishments and as students see it, at the end the arts course would more likely lead to reward for his ability. So if he has any opinion of his ability, why should he choose science?

After suggesting a partial diagnosis, I suppose I should suggest some treatment. Broadening the examination requirements does not seem really fair on the pupil, and to keep changing the syllabuses merely adds to the work being done by overloaded science teachers. We should start by trying to make science appear as attractive as it undoubtedly is to the enthusiast. Scientists must communicate with one another in English, and with the rest of the community with enthusiasm. We should infiltrate the BBC, and the mass media. And we should find some way in which people can be fairly rewarded for their ability.

Seen among a list of pop groups on a poster for the Lyceum Easter Festival :

Van de Graaff Generator

Still, as the film mogul said, 'All publicity is good . . . bad publicity is good too.'

Following observations made earlier this year at the Old Bailey, relating to section 2 of the Official Secrets Act – or the Obscene Publications Act (whichever it was) – we now feel free to publish a revealing document of tremendous import, which we deny was given to us at any time during a party (or 'committee') or a working lunch. Nor will we reveal that our source was Yvonne Taylor and Peter Casey of the Nuclear Physics Division.

confidential

glossary of terms

For the sole use of members of SRC boards, panels, committees, etc. etc.

applications	
Necessary	*Desirable*
Desirable	*We still have some money to spend*
Useful	*The manufacturer has offered me 10% off*
Clearly preferable equipment	*It matches my laboratory decor*
referees	
Not of SVF (Senior Visiting Fellow) status	*I've never heard of him*
Already in progress elsewhere	*I propose to steal the idea*
Appears a sound case	*I know nothing about it*
An excellent case	*He used to be my research student*
An absolutely impregnable case	*I've been asked to referee my own application*
boards and committees	
Insufficient timeliness and promise	*Second-rate routine data collection*
Competition for funds was severe	*Your project was no good*
The application lacked scientific merit	*The Committee laughed*
Suitable for students	*We've run out of postdoctoral manpower*
The Board's bid	*The largest number that won't make the Council laugh*
Estimates	*Guesses*
Forward Look	*Wishful thinking*
The report was accepted without discussion	*No one had read the report*
Major centre	*The professor is on the Committee*
Minor centre	*The professor deserves to be on the Committee*
Satellite centre	*Equipment obsolete, but won't lie down*
An important new project	*An expensive extravagance*
A stimulating new development	*An expensive extravagance that probably won't work*
The Board believes	*The Board's Chairman believes*
Members of the Board believe	*All the members except the Chairman believe*
Some members of the Board believe	*Two members believe*
Dr. Jones believes	*Dr. Jones is in a minority of one, and won't keep quiet*
the office	
Concentration	*To him that hath shall be given*
Administrative difficulties	*We lost the papers*
Subsistence allowance	*Inadequate*
Suitable for promotion	*Embarrassingly clever*
(K)night line	*The thoughts of Chairman Brian (see little red book)*
Little red book	*Little-read book*

what's in the nest

A report following an ornithological survey of recognised hibitats

northern fantail

(supportus mancunae)

This well known bird is a distinctive off-shoot of the general species of Supportus, with local sub-specie mutations. Their normal habitat is in the north-west counties of England, but isolated groups are to be found in most counties. Is a great traveller and has been seen and recognised in Asia and the New World as well as in Southern England. Its distinguishing plumage differs from area to area but the two main sub-species are easily recognised by their red and white crests and throats and pale blue crests with throat markings to match. The males greatly outnumber the females, who incidentally carry the same markings. It has been known for the sub-species to mate but when this happens there is often discord in the nest occasioned by inherited prejudices.

When not employed in foraging for food or providing for their young they are usually to be found in large numbers surrounding smaller groups of like species engaged in ritualistic combat. They are very vocal in support of their own sub-specie, and although no general recognition call can be identified, a three part call resembling 'sendimoff' is prevalent in most areas.

This form of ritual combat is usually at its peak between August and April but it has been recorded that small outbursts occur at other times of the year (*eg* beginning of July).

They have a strong aversion to their southern counterparts, who are only distinguishable by their head and throat markings, and tend to get restive if their prowess in combat is questioned. After defeat or victory they are not vindictive and one usually finds them at the local watering hole jostling in a friendly manner with those who only a few hours earlier would have been prepared to draw blood in defence of their kind.

sussex white sporter

(fagiani philcoxii)

This bird, named after a very well known ornithologist in the area, is a native of the Sussex marshes. It is not thought to stray far from the local breeding grounds. Has no distinguishing winter plumage but in summer a white covering emerges. When travelling tends to move in flocks of twelve. During the summer months this specie usually spends most of its time on nearby village greens intimidating potential rivals with short runs and flailing appendages.

An interesting point about this bird is its great aversion to water. At the merest hint of rain it always seeks shelter. It cannot be considered a songbird, but at regular intervals utters raucus sounds which are rarely understood except by the most veteran watchers. When rivals show stubborn defiance the white sporter is liable to get angry and the intimidatory runs become faster and more violent. When resistance is overcome they soon recover their composure and are content to let the rival leave the area unmolested.

Very few females exist of this specie, but the male has been known to pair off with any unattached female of other species when the opportunity arises.

common wanderer

(sectus auditii)

Very rarely seen alone and usually travels in flocks of four or five. Although having a main nesting area they are to be found occasionally in all regions. These migratory journeys can, and do, occur at any time of the year but are of short duration only. Females of the specie are, like the Fagiani Philcoxii *(above)*, very rare. Their habits are very unpredictable but in general they are to be found poking their beaks into the most unlikely places. Natives in the migratory areas do not relish these sporadic invasions but normally accept them as inevitable. No distinguishing plumage and tend to blend inconspicuously with natives in all areas. Are thought to have a suspicious nature.

northern watcher

(patrius caledonae)

This bird is only found in the southern part of Scotland, making very infrequent forays into England. It is basically of nocturnal habits and prefers clear moonlight nights for observing distant objects. Plumage is sometimes considered drab when compared to some of the English birds but the bulky nature of their plumage, evolved because of extreme climatic conditions, gives a very unusual silhouette when outlined against the sky. Birds of similar habits are known to exist in Southern England and South Africa but only occasionally do the species intermingle.

Anonymous Hyde

Q column by 'observer'

ps

Now the postal strike is over we give a very warm thank you to everyone who kept the communications systems going, particularly to those who bore the brunt of it – like office services, registries, messengers, drivers, voluntary carrier pigeons, the telephone girls who kept London Office on the line and the staff who manned the 'answering service' rota. The overall effect seems to be an increase in the use of corn plasters and visits to the cobbler, but several inches lost around some circumferences. Pathfinding has improved and full marks go to the Rutherford and Atlas drivers who rushed things round the Thames Valley on the service organised by the Secretary of Atlas, Mr. C. Roberts, covering our own establishments, the UKAEA's and various universities, not to mention all the single deliveries dropped off on the way. Establishments north and south looked after other main centres and the crisis found most people ready, literally, to go out of their way to deliver important letters, pensions and everything necessary to keep SRC going at the speed of the twentieth century.

Just imagine how it would have been in January 1771, asking a horseman to carry a letter from London Office to Daresbury and not knowing if he would ever arrive. In 1871, our Aberdeen correspondent says, Queen Victoria could arrive there from London (on her way to Balmoral) *in less than twelve hours* by the new railway. In 1971 the service had improved by an hour and a half, if you picked the right train, and the motor car had been invented for getting to places where the track had been taken away again but on the other hand you could transmit a message instantaneously by telex or telephone, not to mention radio, and one chap did it very expensively by television. In 2071 will people just think the message and let the cybernetic system decide where to send it or, even, whether it should be sent at all. Will they even know how to write?

'no quertyuiop today'

One thing we were always sure about was that agency typists had jam on it when it came to knowing how to live in freedom and yet still afford the holidays abroad sort of status symbols which are the only real proof of success in life – or so the ads try to convince us. Then came the postal strike (remember it?) and the popularity rating of letter writing dropped sharply, giving place to those essential office routines of chatting to all and sundry on the telephone (the 'my time is money' image – there were queues for lines all over the country), filing away all the letters sent, received and discarded over the past twelve months (some people saw the tops of their desks for the first time) and making tea (they also found the kettle).

The pace became rather calm in some quarters not too close to a night line. Messages sent by hand took a little longer and if they were to go any distance they had to wait until some unsuspecting professor arrived for a committee and found he was expected 'if he would'nt mind' to take five large parcels all the way back to Liverpool, or Manchester, or Edinburgh, or vice versa.

Without letters the urgent demand for agencies to supply a shorthand typist 'now/within half an hour' disappeared altogether in some firms – although not in SRC offices where they are all regarded as amenities – and for the first time since the typewriter and the woman to use it was invented, typists were seen at the labour exchange. (Apology for not remembering the fancy new name, it was always 'down the labour' to its best supporters).

The brighter side is that some of those bright young dolly birds might have to go to Margate this year instead of Majorca. That should make it look a bit more like the posters.

lexicological

When we heard that the Government were to ask manufacturers to put warnings against smoking on *advertisements*, it sounded like a contradiction in terms to one who had come to believe that 'to advertise' meant to persuade people to buy things and the shoddier the goods the 'better' the advertising required. So we looked it up in the Concise one and found, as all dons know, that the verb means to notify, inform or, indeed, *to warn.* We are left in no doubt that the phrase was the work of a civil servant coining a 'nice' one for his Minister (in the Oxford sense) – those chaps can indeed be very subtle.

time off : 1

legal London

A. G. Wilson

State House is in the centre of legal London. From its upper-floor front windows may be seen Lincoln's Inn and, beyond, the back of the Law Courts in the Strand; while from the windows at the east end is visible the equally noble Gray's Inn. The other two Inns of Court, which have the exclusive right of calling persons to the English Bar, are Inner Temple and Middle Temple, but a short walk away between Fleet Street and the river.

As a Londoner the courts of law have long fascinated me and it seems strange that so few of my fellows ever bother to investigate the opportunities for interest and entertainment they so readily provide. Some may feel that it isn't quite the done thing to seek entertainment in the courts, since in many instances a court action means distress to somebody, but for many years a columnist in the Evening News carried a large public with his 'Courts day by day' which was never unkind but always very funny.

The Law Courts in the Strand deal with civil actions and appeals, but they have one criminal court, that of Criminal Appeal, which is the only one to have a dock for a prisoner. Members of the staff who take an early lunch might look in at one of the courts there as they seldom rise for lunch before one o'clock. Entry is gained up the spiral staircase, either side of the main entrance. The Cause List in the glass cases on the walls outside the building will explain what is on and where, and if the Lord Chief Justice is sitting in his court his should be preferred. These courts have all the traditional formalities – robes, wigs and gowns – which are not seen in the lower courts or the Police Courts. The Old Bailey, about ten minutes away in Newgate Street, is the country's great criminal court and in the past has dealt with most of the notorious murderers of the present century. This may be visited if one is prepared to queue up before the court opens.

Over a period of more than thirty years I have visited many of the courts, using up the odd day's leave by hearing most of the crimes in the calendar. The Police Courts, which have a full-time salaried magistrate, are having more and more to cope with motoring offences, but they tend to deal with these in the afternoons so the morning is the time to go. A chance visit to Marylebone Police Court during the war gave me my most amusing experience.

One evening a gentleman registered at a quiet and select hotel in Paddington. He enquired why the young man at the reception desk was not in the Forces and was informed that he had been discharged on medical grounds. 'Then how would you like to be my aide'? asked the gentleman, adding 'I am Sir Thomas Lawrence. The reports of my death were put out by the Secret Service to cloak my activities underground in Russia and I have now returned for active duty. I am going to the palace tomorrow to receive the KBE' T. E. Lawrence (of Arabia) had been killed, I believe, in 1935 by crashing his motor cycle.

In the course of a few days the gentleman had borrowed a morning suit from one of the hotel guests in which to go to the palace, had shown all the guests a decoration which he said was the KBE that the King had given to him, issued the receptionist with a document on buff paper appointing him aide-de-camp and proclaiming him Captain, obtained a Captain's uniform and a Major-General's uniform for each of them respectively from a military outfitters and opened bank accounts for them both at a bank in Piccadilly.

The receptionist lost no time in giving up his job and assuming his new uniform and duties, but it was not apparent what the latter were. Whilst so occupied he appears to have been pulled up by the police and as proof of identity produced the letter given him by Sir Thomas. This started off the chain of enquiries that led to the case I was watching, at which the doubtful Sir Thomas was charged among other things with falsely wearing the uniform and badges of a Major-General and decorations. The magistrate, Laurence Dunne (who was later knighted and became Chief Metropolitan Magistrate at Bow Street), found much amusement as an officer from World War One in pointing out that the hotch-potch of decorations on the uniform were out of order and some inappropriate. The man seemed to have been apprehended before he could get fully launched, as the offences were not voluminous, but he was sent to the Sessions for trial and got, I believe, eighteen months.

I had been something of a fan of T. E. Lawrence and had read most of the literature then extant by or about him. It puzzled me that this small man, with a large head and good crop of hair, could be impersonated, with some success, by a large fat man with a bald head – for such was the bogus warrior's appearance.

The author works in LO Administration Division

time off : 2

London transport

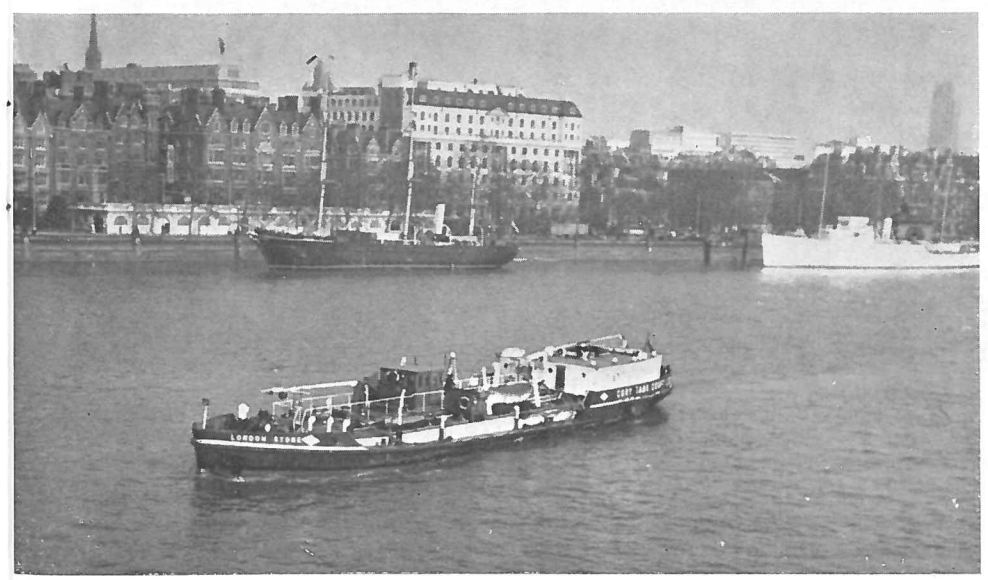
One advantage of working in London Office is that London is a focal point for all modes of transport and if, like me, you are a transport enthusiast, you can find quite a lot to interest you. Take a camera on your explorations and you will find subjects such as the two vessels illustrated in these photographs.

The picture above of a tug taking an empty lighter downstream is a familiar sight on 'London River', as the Thames is known to sailors all over the world. The tug, 'Fenland', is a 38-ton, 400 bhp motor vessel built in 1929, at a time when tugs were generally steam-powered. This early example of the now almost universal motor-tug has served her owners for 42 years and must be considered an excellent investment.

The picture below shows 'London Stone', a self-propelled barge of some 100 tons owned by the Cory organisation, well known as oil distributors. 'London Stone' and others of her kind are dual-purpose vessels that not only serve as barges themselves but can also be used to tow one or more dumb (engine-less) lighters.

In the background is Captain Scott's 'Discovery' which has been berthed at Victoria Embankment for fifteen years, and now serves as a training ship for the RNVR. The vessel is open to the public at times, but at the time of writing the grand old lady of the sea is undergoing a refit because she is suffering from, of all things, dry rot! This is more of a problem than might be supposed since the timber hull, built to resist the pressure of the ice in the Antarctic, is 2ft 2in thick in most places. The bowsprit and rigging are also being renewed.

There is plenty more of interest in London. The Clapham Transport Museum, whose fate is at present in the balance, deserves an article to itself, and the railways are not without interest even though steam has been displaced by 'inferior' forms of power. However, my major interest is in buses and coaches, and I hope sometime to be able to tell you a little about this hobby and to describe the 22-year-old coach I have saved from the scrapyard.



a land of clear water

Dennis Fogerty

This unusual view of the Ayasofia Mosque or 'Church of the Holy Wisdom' was photographed from a vantage point on the Sultan Ahmet or 'Blue Mosque' looking towards Seraglio Point and the Bosphorous. Erected in AD 537 by the Emperor Justinian on the site of Constantine's earlier church, it was turned into a mosque in 1453 when the city fell to the Turks. Under the Turkish Republic it is now a museum and many of the original Christian decorations have been uncovered after 500 years under plaster and paint. The large middle dome rests on two half domes and is considered to be an amazing architectural feat. Photo by courtesy of the Turkish Tourist Office.

Turkey with her magnificent past glories of an Imperial heritage, is full of historic treasures covering the ruins of twelve successive civilisations. Even tourists who spend only a few weeks there can see traces of more than twenty centuries of history.

In this same land which bears the marks of the past, now live a smiling hospitable people – the Turks. Although they have to fight hard to make a living, it is difficult to find a friendlier people, and a visitor is made very welcome.

Turkey offers the holidaymaker a complete change from the cares and routine of everyday life. From May to September most parts have a perfect climate – with temperatures rarely falling below the seventies (F, that is, or twenties (C) if you insist) – providing ideal conditions in which the visitor can relax on sandy beaches or enjoy the peace and solitude of mountains and lakes.

Besides these attractions, the cost of living is extremely low. For 10p (2½ Turkish lira) one can buy a kilo (2 lb.) of grapes, apples, pears, peaches, or oranges. In the larger towns lunch or dinner costs from 20p – 30p and a single room with bath costs between 50p – 80p per night. Luxury hotel rates are of course more expensive but the rates are much lower than in most European countries.

I suppose that I could claim to be a pioneer in overland travel by car to Turkey. I have returned there every year since 1965 and my annual camping expeditions have become a regular habit. Last year, just for the fun of it, I hired a mini-bus and introduced a party of new visitors, one of whom was Ken Somerville of ROE. This venture was called 'Topkapi Safari' and it proved to be a success well worth repeating this season, and this time there are four expeditions and more drivers. A heavy strong vehicle with a good turn of speed is required for the long overland journey and to stand up to the rough conditions found in some remote regions. My choice is the long wheel base transit-bus. It can carry a group of 15 passengers, easily, deep into the interior of Anatolia and beyond.

'Topkapi Safari' expeditions are suited for the young and adventurous who wish to share new places and faces with mixed group informality and freedom. The upper age limit is flexible, providing the participant is fit and healthy and willing to join in and have a go at *anything*. For instance passengers help load and unload the vehicle and participate in every way – there is no one else to do it. Definitely no spoon feeding!

The overland journey through Europe passes through six countries – France, Belgium, Germany, Austria, Yugoslavia and Bulgaria, on the busy communication trunk roads linking Europe with Asia. This is an historic route used by Roman legions, the barbaric tribes, the Slavs, the Crusades and, in the reverse direction, the Ottoman Turks.

The journey of nearly 2,000 miles is completed in four days. We travel fast stopping for meals and fuel only, at regular intervals. At night we do stop for sleep at suitable way-side spots but we use the minimum of tents and do not change into sleeping attire. At first light we are away again, halting for breakfast later in the morning. It is a hard and fast journey but this way we reach our destination – Istanbul – on the fourth day. The last 100 miles seem interminable because by this time we are travel weary and a bit dirty.

In Turkey at last! The Sun is shining, the people smiling and everything looks so different. Ox carts, horses and donkeys, everything at the slower pace of the East.

At Istanbul we want some luxury and feel we have earned the good long rest of four days. We stay at the BP Kartaltepe Mocamp, one of the most modern sites in Europe with constant hot and cold water, beautiful tiled showers and toilet rooms, cooking, laundering and ironing facilities, snack bar and restaurant, souvenir stand, exchange bureau and swimming pool. There are free swimming facilities at the BP's private beach 3 kilometres away, and nearby some of Istanbul's finest golden beaches, on the sea of Marmara.

The city itself is absolutely fabulous. For two thousand years, in its glorious situation astride the Bosphorous, this great city has been the capital of the empires which have formed the bridge between Europe and Asia. Istanbul – or Constantinople as it was – already counted her population in millions while London was still a village on the Thames. It is alive with history – with castles, palaces, churches and mosques. There is a bewildering variety of life, from the maze of alleyways around the old market, which look as if they have not changed very much in a thousand years, to the smart residential districts of Beyoglu with its modern hotels and apartment houses which equal anything in Paris.

The bazaar district of the old city is a fascinating wilderness of tiny shops in which it is possible to buy objects excavated from the sites of ancient Greek and Roman ruins. There are manuscripts and icons from the old churches of Byzantium, Persian miniatures, Ottoman brassware, carpets and rugs from all over the orient – an unending variety of fascinating and beautiful objects which the discriminating purchaser can often secure for very small sums of money.

All too soon we must tear ourselves away from Istanbul. On the longer three-week trips we cross the Bosphorus into Asia and then on to the Aegean or Mediterranean sea coasts. Turkey has a comprehensive road system, the main roads are generally good, and once outside Istanbul the traffic is light. Our

travel policy is now reversed and we often stop for visits to the many places of interest and, of course, for refreshment. In the Mediterranean region apart from the natural beauty there are Greek, Roman, Arab, Crusader and Ottoman remains to explore. In the Aegean region there are more Hellenic ruins than in Greece itself, also Roman and Byzantine influences.

During the Summer these regions are very hot and arid and it is necessary to replenish body fluid frequently. Turkey is noted for its wonderful natural water which is often drawn from deep wayside wells. It is of excellent quality, ice cold, clear and sparkling. Some wary visitors from Europe insist on treating all Turkish water with pills or tablets. This is unnecessary but if it makes you feel better do so by all means. One of the sad things about leaving Turkey is the prospect of returning to our cloudy processed water, often tasting of chlorine.

Turkish bread is good and cheap made from stone-ground natural grain with no adulteration. Together with cheese, fruit and sour milk it is the staple diet of the peasants. Meat is an expensive luxury enjoyed about once a week. At the tourist exchange rate Turkish meat is cheaper than in the UK but tends to be tough due to the arid conditions. Turkish cooking has its own special quality and characteristics and is certainly different – most visitors enjoy some particular dishes. In country districts it is the usual thing for customers to be invited into the kitchen to make their own choice. Very often the whole family will parade at the exit to say 'güle güle' ('go smiling') because they feel honoured to have Europeans as patrons.

The Turkish people are of the Islamic faith. They have a long tradition of tolerance toward the Christian (People of the Book) and Jewish religions, originating from the days of the mighty Ottoman Empire which contained a kaleidoscope of many nations and religions living, for the most part, in peaceful harmony and enjoying a common citizenship from the Atlantic to the Indian Oceans. Nowadays in all parts of Turkey it is possible to enter the Mosques and other sacred places provided that one is decently dressed and behaves with restraint.

The memory of Ataturk is strongly venerated everywhere. After the first world war the country was occupied by military forces from Britain, France, Russia, Italy and Greece and the Turkish homeland was reduced to a small territory in central Anatolia. By diplomacy and war, Ataturk drove out all the invaders and managed to unite the whole of Anatolia and Thrace under the flag of the Turkish Republic, then commenced a programme of reconstruction and modernisation that continues to this day.

In recent years Turkey has pursued a policy of self reliance and sacrifice, importing very little except essential raw materials, and making great strides toward industrialisation. The hardworking Turks expect an improvement in their lot, because of this, within the next decade. Turkey is an associate member of the Common Market and will become a full member in a few years, she is also a loyal member of NATO and the most powerful military nation in the Near East. The fighting qualities of the common Turkish soldier are well known and it is true that the tough Turkish peasant can endure incredible hardship and will fight to the death.

Turkish gold, silver and jewellery is of very high quality and of superior workmanship, but considerably cheaper, than in Europe. Other good buys for visitors are brass and copper ware – the usual stuff made for tourists, but it is *Turkish* – remember nothing is imported. Leather too is mostly of good quality, very soft and smooth and wears well. A full length maxi-coat, made to measure, can be bought for £12-£14. Men's car coats or short jackets, very nicely tailored to measure, £10-£12.

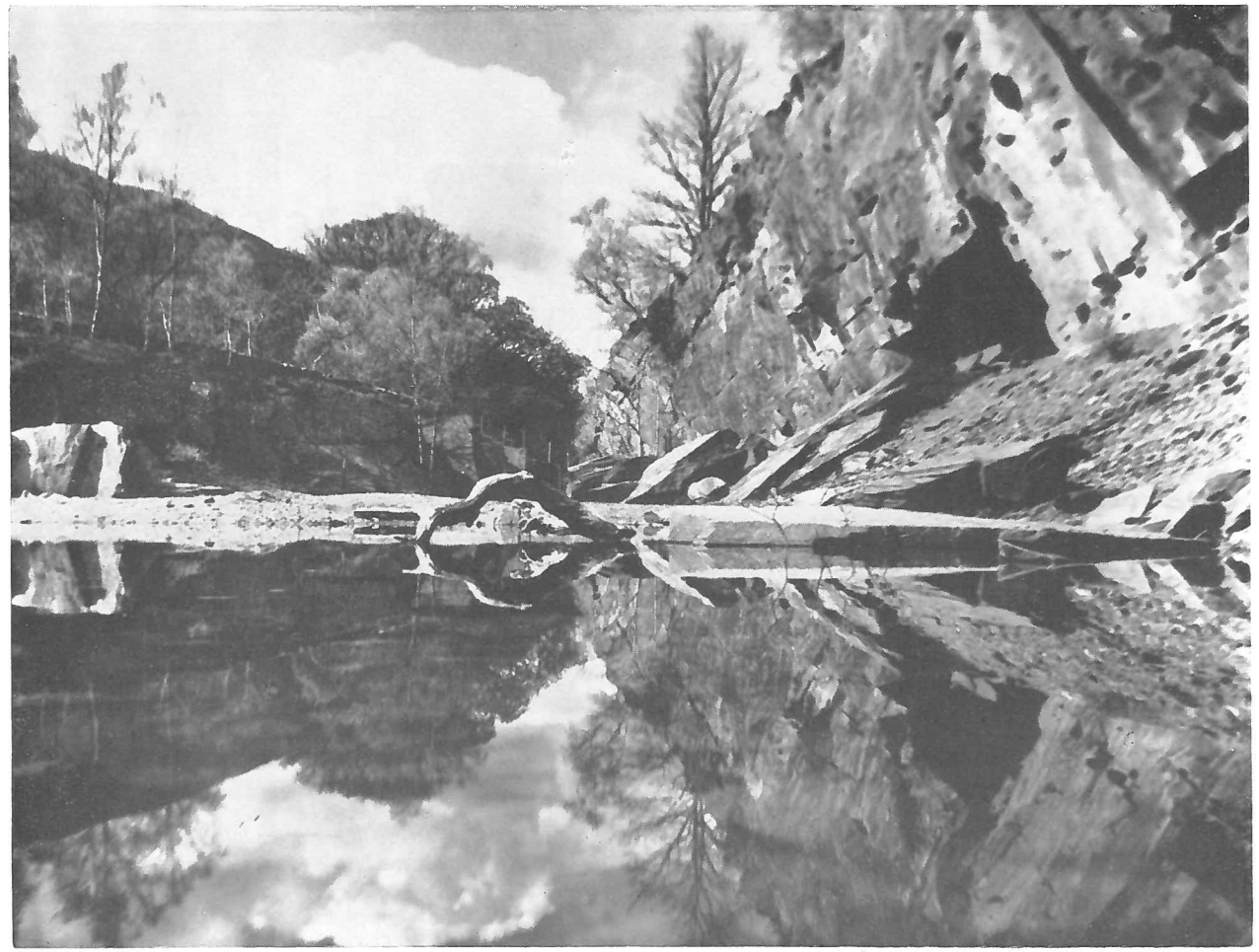
A last few words for visitors. Don't expect too much. There is dirt, dust, flies – all the usual inconveniences of a hot and dry summer climate. The Turks will not put on a special display for you, you will see terrible poverty, children and adults dressed in rags and patched up clothes but they are happy and contented and, as yet, bear no animosity towards the better off visitors. In spite of all this, there is a certain charm about the place that gets under one's skin. I suppose I am just hooked on Turkey, and if anyone reading this wishes to see the *REAL* Turkey, come with me, on 'Topkapi Safari', 1971.*

These are the holidays for 1971:

To/1 Sea of Marmara Tour: June 4-20	
Istanbul-Gallipoli	*16 days*
To/2 Aegean Sea Tour: July 2-25	
Istanbul-Bursa-Kusadasi-Ephasus-Pergamum-Troy-Gallipoli	*23 days*
To/3 Mediterranean Sea Tour: August 6-30	
Istanbul-Ankara-Silifke-Alanya-Istanbul	*24 days*
To/4 Aegean Sea Tour: September 3-26	
Istanbul-Bursa-Kusadasi-Ephasus-Pergamum-Troy-Gallipoli	*23 days*

All holidays include use of cooking and camping equipment with comprehensive health and baggage, personal accident and cancellation insurance, also international camping carnet cover, and all camping fees and ferries are taken care of.

**Bookings can be arranged through the exclusive agents 'TRAILFINDERS' 48 Earls Court Road, London, W8 6EJ. Tel. 01-937-4569. Further information can be obtained from Dennis Fogerty 'TOPKAPI SAFARI', 99 Elmshurst Crescent, East Finchley, London. N.2. Tel. 01-883-0915. Dennis works in the Internal Audit section of Finance Division at London office.*



The Old Slate Quarry, Borrowdale

time off : 4

Peter Culba

This year why not try the English Lake District for a holiday? Forget the old joke about the 'Lakes' having a six day week with no **Sun**day, because while it can and does rain quite a lot – having the wettest habitation in England – the sun does shine and if you choose the right time of year, with a bit of luck you will find it.

Generally the driest part of the year is the period May to the middle of July, May being the driest but rather on the chilly side, so for a first visit I would suggest late June or early July. September and October can be pleasant, but you have more chance of rain and hours of daylight are on the short side.

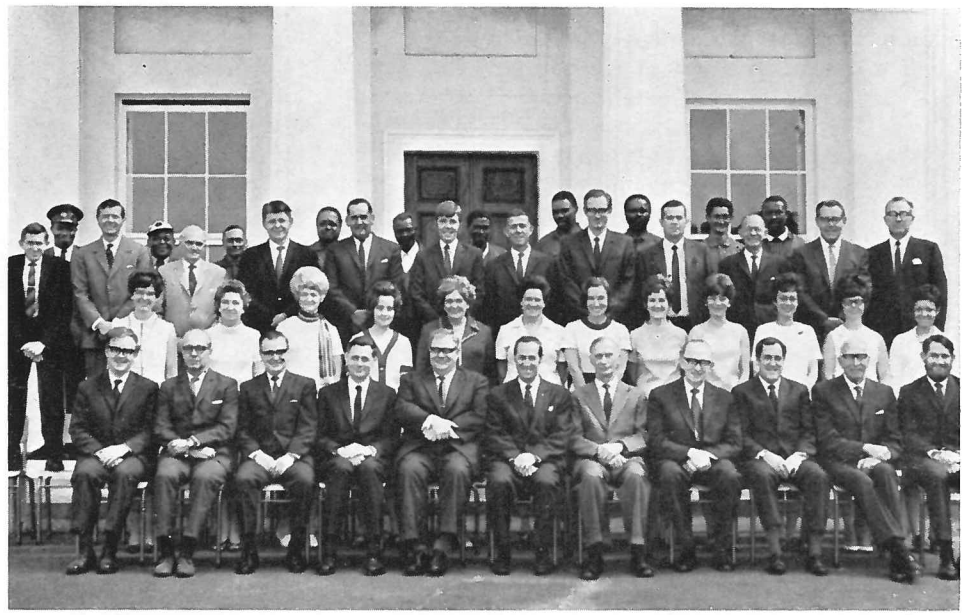
If you contemplate doing some walking, choose Keswick or Ambleside as your centre, whilst Windermere is a useful centre if you are interested in yachting. (Bathing may be had almost ad lib, except on Thirlmere where it is strictly forbidden).

Strong footwear is advisable for general use in visiting well known viewpoints, and commando soled (or nailed) shoes or boots are essential if you intend climbing any of the many peaks over 2,000 ft. as is an Ordnance Survey 1'' map, compass, and the knowledge of how to use them. Extras, in the way of clothing and food *ie* sweaters and chocolate, should be taken if venturing on the higher peaks as the temperature can be much lower than in the valleys and you may need the chocolate to provide the extra energy to keep warm. Drink is usually no problem as the water in the mountain streams above say 1,000 feet is quite safe to drink.

If you are not the walking type you will still enjoy a trip to the district. There are boat trips, swimming, golf, and of course the superb scenery, and the many waterfalls of which perhaps the best is Aira Force (120 foot fall) – car park nearby or by bus from Keswick.

I shall be only too pleased to help anyone who is thinking of going, with information on accommodation etc, if they get in touch with me.

Peter Culba works in the Contracts Section at London Office. He processes his own photographs like the one above.



at the cape

This photograph of the Observatory staff was taken to commemorate the 150th anniversary. (See Quest article in Oct '70 issue) From left to right they are:
front row: J D Laing, P R Cook, A Shortland, P M Corben, J Churms, G A Harding (The Officer-in-Charge), A W J Cousins, W. G Grimwood, P W Stimpson, T W Russo, T G Hawarden
second row: S F Parker, H Rigby, C Strydom, A J Goedhals, D E Johnson, M C Coetzee, R M Banfield, A A Neethling, J E le Roux, Y Z R Thomas, B Brown, C A Byrnes
third row: W G Pearson, R W Etherton, L C Browne, M A Edwards, A T Rose, B S Carter, D J Ribgy, G M Harvey, D S Malan, W A Rasmussen, A E Cordwell, O G F H Fiamingo
top row: A Congwane, L Makobs, H G Haupt, P E Zikalala, G Mgayiya (deceased), N Matiwane, J Blom, N C Thompson, P P Okkers, A Mngoma.
photo by Colin Edwards, Cape Town

congratulations

to Dr N. Lipman of the Rutherford Laboratory who has become a Visiting Professor of the University of Sussex.

and to Professor Fred Hoyle FRS who has been appointed as the next President of the Royal Astronomical Society, to succeed Professor Sir Bernard Lovell. Professor Hoyle, Plumian Professor of Astronomy and Experimental Philosophy at Cambridge University and Director of the Institute of Theoretical Astronomy, is a Member and Royal Society Assessor of the Science Research Council, a member of the Astronomy Space and Radio Board and Chairman of the Astronomy Policy and Grants Committee. He is also Vice-President of the Royal Society, a Foreign Associate of the National Academy of Sciences and Professor of Astronomy at the Royal Institution.

★

Professor Sir Brian Flowers FRS was the Physicist on the panel of judges on the final 'Young Scientist of the Year' programme on BBC 1 television. With him were Professor George Porter FRS, Director of the Royal Institution and Fullerian Professor of Chemistry, who received the Nobel Prize for Chemistry in 1967, and Dr. John Carthy, Zoologist, the Director of the Institute of Field Studies.

The young competitors appeared in preliminary rounds over the previous few weeks. The project of the winning team, from Sittingbourne (Kent) Girls' Grammar School, related to genetics and eye colour. The other two finalist teams had carried out studies on moss ecology and on electronic traffic stimulation.

★

Visitors to the Rutherford and Harwell Laboratories who have admired the surrounding grounds will be interested to know that the Superintendent Mr. A. E. Burge MBE received the Silver Gift Medal of the Royal Horticultural Society for services to the AERE Horticultural Society over the past 20 years. The medal is only awarded in cases of real merit and those who have enjoyed the benefit of the beautiful surroundings he has created (under very difficult conditions) feel that it is a just tribute. Mr. Burge retired from AERE in December but not, of course, from gardening. Before joining Harwell 20 years ago he had been in charge of St. James Park, having worked for 32 years in the London Parks, and had also been responsible for laying out the Roosevelt Memorial Gardens after the war.

Doug House, ACL

new to Quest

To replace Bill Napier, ROE, and Fred Lunnon, ACL, who have left the Editorial Board, we are pleased to welcome Jim Campbell, ROE, and Doug House, ACL. We also express our thanks to the retiring members for their support.

Doug House has been Deputy Head of Operations at ACL since 1964. Before this he served with the Royal Naval Scientific Service since leaving school, first coming into computer work in 1956 as an engineer until he joined SRC and changed to operations. Previously he had worked at the Royal Naval Physiological Laboratory in underwater blast and applied physiology and had taken part in some experiments as a 'guinea pig'. His main spare time interests lie in sport, particularly cricket and golf – his handicap is 12 !

Jim Campbell is a Senior Scientific Officer engaged in space research at ROE.

pro sano corpore

(or, for the less latin types,'how to achieve a sane corpse')

Sports day 1971. June 30 is the provisional date for the event. (Details will be published nearer the time). It will be held at Chiswick as before and will include all the events of last year – bowls, cricket (there will be 2 pitches this time), netball, six-a-side football and tennis (men's and mixed doubles). The Sports and Social Association hope that all establishments will be well represented both by teams and spectators, remembering that this is as much a social occasion as a competition.

[Our crystal gazer can't foretell anything of real meteorological value but does forecast a rise in pressure around the ladies' netball matches in proportion to the prevalence of 'hot pants'. Ed.]

Cricket. A team to represent SRC has been entered for the Curtis-Bennett cricket competition, the all-civil service tournament. Spectators are welcome if you can spare a day's leave. Watch notice boards for details and dates of matches.

exact image

Since the inauguration of the Isaac Newton telescope by the Queen in 1967, there have been many visitors to the public gallery. Throughout the year the public are allowed to view the large 98in reflecting telescope from an especially constructed area at the observational level some 48 feet above the ground. Among the exhibits on view is a copy of the replica of the first reflecting telescope made by Sir Isaac Newton in the 17th Century – the replica itself was presented to the Queen by the Astronomer Royal at the inauguration ceremony. Both the replica and its copy were made by members of the RGO engineering workshop.

Visitors are unable to see the notice that has been attached by some joker to the far side of the showcase (see photograph) but the standard of maintenance provided by the Observatory's engineering and electronic workshops is so high that there has been no need to resort to such drastic measures.