THE EIGHTH LONDON INTERNATIONAL

Youth Science Fortnight

AUGUST 1966

"Give a man a fish and you feed him for a day: Teach a man to fish and you feed him for a lifetime"

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Patron	His Royal Highness the Duke of Edinburgh, K.G.
Vice Patron	Sir John Cockcroft, O.M.
President	Sir Lawrence Bragg, F.R.S.
Vice Presidents	Dame Kathleen Lonsdale, D.B.E., F.R.S. Eleanor, Lady Nathan, M.A., J.P. Dame Irene Ward, D.B.E., J.P., M.P. W. J. Langford, C.B.E., M.Sc. The Rt. Hon. Lord Luke of Pavenham, T.D., D.L., J.P. Sir Peter Runge

The Science Fortnight is a constituent part of a programme of international events aimed at bringing together young people from all nations, and organized annually by Worldfriends International Service for Youth

The London International Youth Science Fortnight is organized by Worldfriends International Service for Youth in consultation with the British Association for the Advancement of Science
The Aim of the Fortnight is to give a deeper insight into science and its application for the benefit of mankind and to develop a greater understanding between young people of all nations

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London SW5
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YOU have paid me a great compliment by inviting me to be your President this year and I thank you warmly for the honour.

As some of you may know, one of my great interests is talking to young people about science and trying to convey to them something of its thrill. I have talked to some 100,000 during the last ten years.

My scientific interests have always been in the field of fundamental science, except in the two world wars when we were all involved in the scientific problems with which they confronted us. I like to call it fundamental science because I am very allergic to the term "pure science" with its implications that there is another kind of science of opposite character. Nothing could be more international than fundamental science. Its discoveries spread all over the world irrespective of frontiers and race. There may sometimes be a little healthy rivalry in experiencing pleasure that some new discovery is scored to the credit of ones own country, but it is inconceivable that such a discovery should not at once become the property of all countries.

Your special interest this year, I understand, is the application of this international body of scientific knowledge in the development of the world's resources. As in all problems of the application of science, the actual scientific element is only a fraction of the whole and generally the easiest to deal with. Politics, organization, management, education and psychology are the main factors which determine success or failure. It is a fascinating problem for you to study, and you have my warmest wishes for the success of your endeavours.

W L Bragg

Sir Lawrence Bragg
President: Science Fortnight

THE London International Youth Science Fortnight has proved to be a most successful venture. Almost without exception the young people who attended these meetings have gone home delighted with this experience and enriched in knowledge and spirit.

Many people have become anxious and suspicious of international meetings because so often they seem to do more harm than good. The Youth Science Fortnight has an impeccable record because there are no conflicts to be resolved; there are no resolutions to be passed and, above all, because science itself is completely international.

It may be too much to hope that the spirit of friendship and understanding, which develops so quickly in each Fortnight, might be introduced into other international gatherings but at least everyone who attends a Fortnight learns that different nationality or background is no barrier to civilized co-operation.

Philip

BUCKINGHAM PALACE
July 1966

International Praesidium of Honour

Their Excellencies

the High Commissioner for Australia
the Austrian Ambassador
the Belgian Ambassador
the High Commissioner for Canada
the Danish Ambassador
the French Ambassador
the German Ambassador
the High Commissioner for India
the Irish Ambassador
the Israeli Ambassador
the Italian Ambassador
the Japanese Ambassador
the Luxembourg Ambassador
the High Commissioner for Malaya
the Netherlands Ambassador
the Norwegian Ambassador
the High Commissioner for Pakistan
the Portuguese Ambassador
the South African Ambassador
the Swedish Ambassador
the Swiss Ambassador
the Turkish Ambassador
the United Arab Republic Ambassador
the American Ambassador
the Yugoslav Ambassador

The Right Honourable Michael Stewart, M.P.
Secretary of State for Foreign Affairs

The Right Honourable Anthony Crosland, M.P.
Secretary of State for Education and Science

The Right Honourable Frank Cousins, M.P.
Minister of Technology

Advisory Committee to the sponsors of the London International Youth Science Fortnight

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Mr. D. M. Hall, M.A.
Mill Hill School

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Principal Information Officer, Department of Education and Science
Mr. R. H. A. Carter, M.B.E.
Royal Radar Research Establishment
Worldfriends International Service for Youth
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Headmaster: de Beauvoir School
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Director

Mr. Philip S. Green, M.B.E.
Executive Director: Worldfriends International Service for Youth

Organizer

Mr. George McGowan
Executive Director: Worldfriends International Service for Youth

OXFAM AND SCIENCE IN DEVELOPMENT

It is estimated that between one-third and one-half of the world's population suffers from malnutrition and that ten to fifteen per cent suffers from under-nutrition. Those people who are under-nourished have an inadequate calorie intake, and those who are malnourished need to eat more nourishing food. The contrast between the diet of the well-fed and the hungry peoples of the world is best seen by comparing the animal protein intake of a typical North American, who consumes about 66 grams per day, with that of a typical man of the Far East, who has 7 grams a day.

Agriculture in Algeria

Oxfam tries to help the people of the developing countries by aiding long-term projects so that causes of hunger will be removed. In addition, Oxfam helps those people who are already suffering as a result of hunger, or disaster by assisting feeding schemes, medical projects, and welfare programmes.

In Algeria, after the war of independence, the nomads of the desert lost most of their flocks of sheep. They are now entirely dependent on the rains to provide water for the trek south to the winter pastures, for the lambs cannot withstand the cold in the mountainous areas to the North where the nomads spend the summer months. Meanwhile, the pastures are deteriorating because of overgrazing and erosion. Father Cheneviere, a Roman Catholic White Father who works at Laghouat in the Northern Sahara, suggested that the nomads might be helped to a more profitable and hopeful future. Oxfam has given £2,900 to enable an agricultural centre to be built at Laghouat, where the irrigation system is now almost complete and a large water reservoir makes possible the cultivation of the entire site. Another Oxfam grant of £2,750 will help to complete the irrigation system. Ten young trainees, from Nomad families, are at work daily at the centre, together with Father Cheneviere, and by October 1966 they will be ready to help their families become self-supporting farmers on the surrounding land. These ten young people, it is hoped, will be the first of many who, twenty at a time, will be trained each year. In this way the nomad population of the Sahara is assisted to rise out of the miserable poverty into which many of the people have fallen through circumstances largely outside their control.

Vaccination Campaign in Nepal

In Nepal, Oxfam is assisting another group of people whose livelihood was threatened because of a danger to the animals on which they depend. Rinderpest broke out, causing sterility, loss of milk and death to many of the country's five million cattle, which are an important source of protein and widely used in agriculture. Unless the outbreak is contained, rinderpest, which has been controlled in most of Asia, will threaten India's herds. The Food and Agriculture Organization of the United Nations undertook to help the government of Nepal to eradicate rinderpest; and in 1963 Oxfam agreed to support this project providing £59,840 over a two-year period, to cover the cost of a veterinary expert, equipment and supplies of vaccine, and making possible a large-scale vaccination campaign for about four million cattle, buffaloes and yaks in Nepal. It is hoped to establish an "immune belt" about 20-40 miles wide on the border between India and Nepal, and after this the rest of Nepal will be covered. During the monsoon period in 1965 the work was suspended, and the FAO expert supervised the production of freeze-dried vaccine in a newly-built laboratory in Kathmandu. It is hoped that sufficient locally produced vaccine will be available soon. The expert was also able to advise on production of other vaccine for the control of animal diseases.

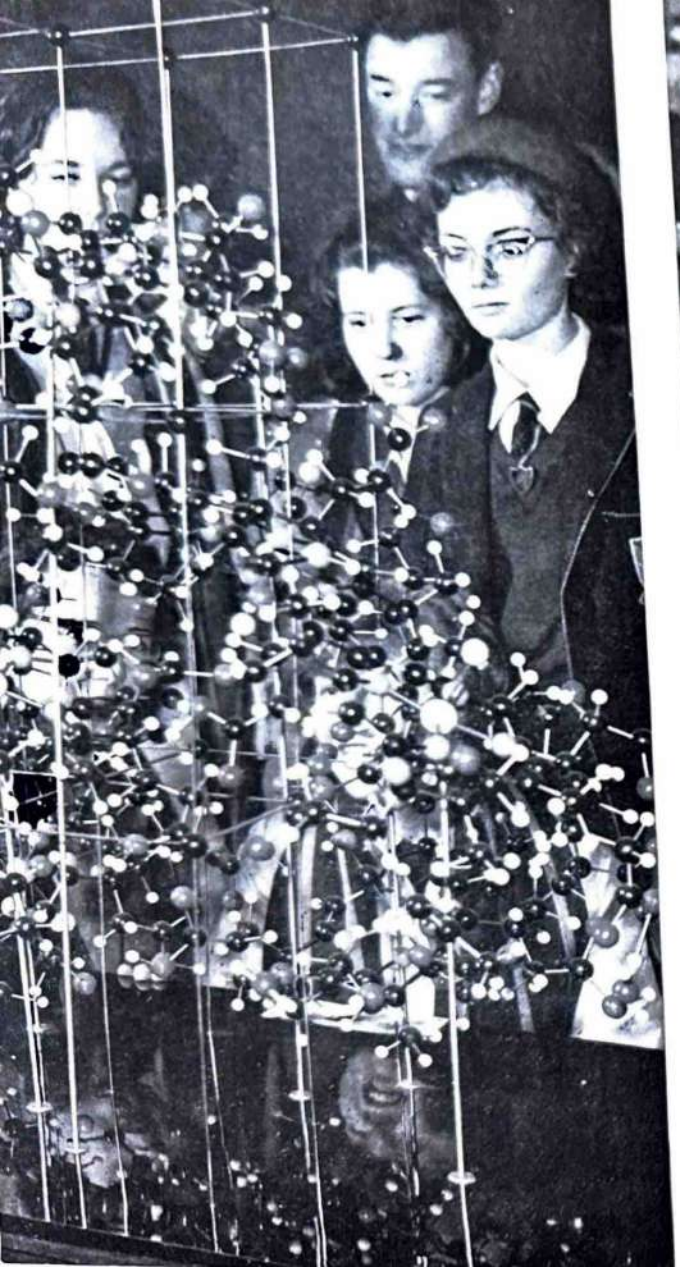
Hybrid Maize in Pakistan

Maize is an important staple food for Pakistan's 100 million people but most farmers there are still using old low yielding open-pollinated varieties. An FAO project, started in 1962, to demonstrate the use and benefit to be derived from hybrid maize has received a total grant from Oxfam of over £34,000. Two pilot projects were chosen in each region, and the demonstration trials have shown that the average yield for hybrid varieties on demonstration and trial plots has been 73% higher than that of the local open-pollinated varieties. There has also been a steady rise in the sale of hybrid seed since the scheme started. As more and more farmers use hybrid seed and improved methods of farming, Pakistan hopes to achieve self-sufficiency in maize production. The World's food problem can only be solved if the developing countries themselves can increase their output per capita. The hybrid maize scheme in Pakistan is an important example of indicating one way in which this can be done.

Fishing in the Okavango Swamps

The people of Bechuanaland (the Batswana) depend for most of their protein and their exports on beef, goat meat, game and fowls. The majority of the people live along the line of rail which follows the eastern frontier of the country. But in the north-west of Bechuanaland, the Chobe and Okavango River systems have long been known to have commercially useful fish species, which might add to the meagre diet and income of the Batswana if they could be got to market before they went bad. Oxfam has financed a survey on behalf of the Bechuanaland government to assess the fisheries resources of these river systems. The fisheries biologist who conducted the survey, Dr. Maar, stated that fish are a major and largely untapped resource of Bechuanaland, but that the Batswana have little knowledge of fishing and no equipment. It was therefore thought, that the development of fisheries should start at village level, and that, to supervise this, a fisheries extension unit should be set up. This unit would include the assistants whom Dr. Maar had trained, and would teach the fishing techniques for a gill net fishery; the young men taught would then buy their own equipment. Economics assistants would teach new methods of preparing and cooking the fish. Experiments and enquiries are also to be conducted into methods of smoking and drying the fish, in order to preserve them for marketing further afield.

Lack of food, and lack of the right kind of food are the two basic problems of the developing world. Feeding schemes meet a need for a short time but do not get at the root of the problem. As the proverb says, "Give a man a fish and you feed him for a day: teach a man to fish and you feed him for a lifetime."



Two contrasting aspects of the 1965 Science Fortnight. Left: a demonstration on "Form & Colour in Nature" and Above: Frankie Vaughan at the Opening Dance

The following companies co-operated in providing scholarships which enabled participants from the United Kingdom to take part in the Fortnight:

Associated Electrical Industries Limited
Beecham Group Limited
Distillers Company Limited
English Electric Company Limited
Esso Petroleum Company Limited
Ford (Dagenham) Trust
Imperial Chemical Industries Limited
Shell International Petroleum Company Limited
Unilever Limited

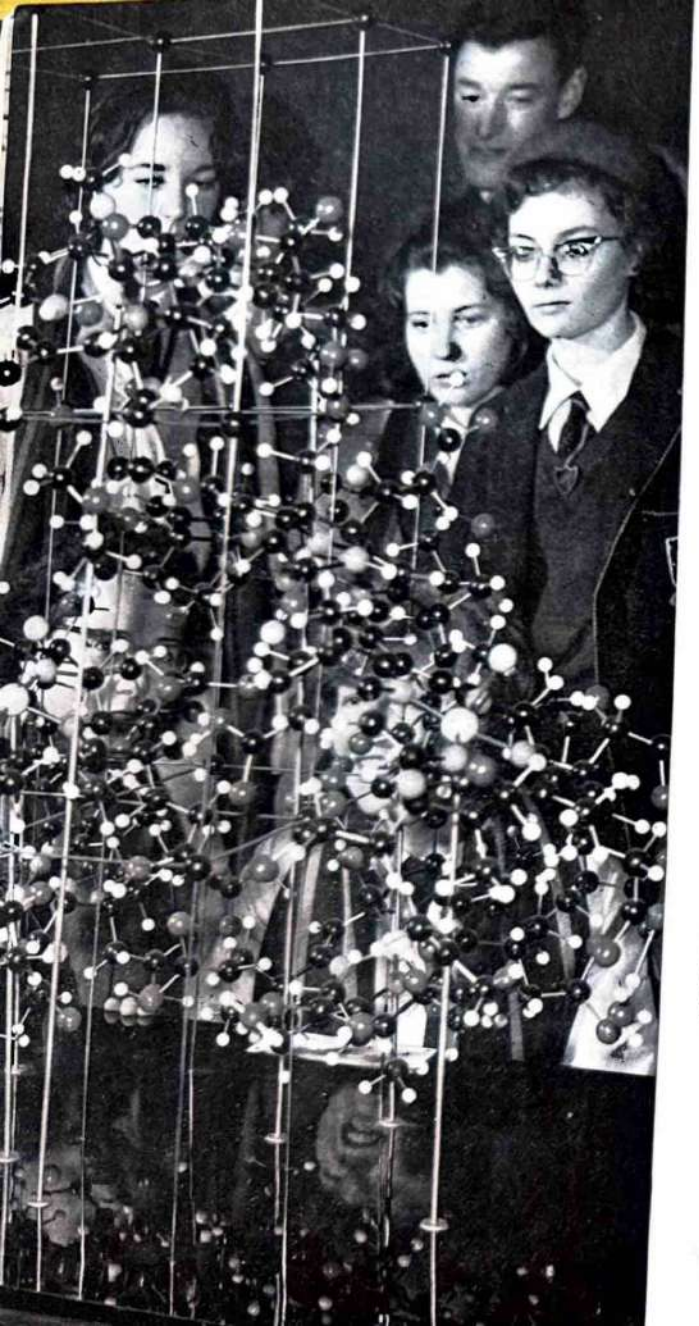
The co-operation of the many sponsoring bodies who have assisted in the selection and participation of the foreign students attending the Fortnight is gratefully acknowledged. It is anticipated that the following countries will be represented:

Australia
Austria
Belgium
Canada
Denmark
France
Greece
Germany
Great Britain
India
Ireland
Israel
Italy
Japan
Luxembourg
Norway
Pakistan
Poland
Portugal
South Africa
Sweden
Switzerland
United States of America

Programme of Events

Wednesday 27 July		Arrivals
Thursday 28 July	**1100**	Briefing Session
	1200	Opening Ceremony Sir Lawrence Bragg will preside and the principal address will be given by Professor P. M. S. Blackett
	1400	Demonstration: The application of bio-chemistry in engineering by Mr. D. T. Shore
	2000	Welcome Dance at the Carisbrooke Hall
Friday 29 July		Group visits to the Science Museum and to the Shell Centre
Saturday 30 July	**1000**	Group A Tour of London
	1400	Group B Tour of London Evening visits to London families for Foreign participants
Sunday 31 July		Optional excursions
Monday 1 August	**1000**	Seminars at University Establishments in London Area
	1400	Laboratory Visits
	2000	Topics for Tonight—discussions in Halls of Residence
Tuesday 2 August	**1000**	Brains Trust in Reverse Sir Peter Runge will preside
Wednesday 3 August	**0730**	Day visit to Coventry (scientific visits)
Thursday 4 August	**1000**	Unesco Day. "Youth, Science & Society"—A Conference on how scientific skills can be used for the benefit of mankind.
Friday 5 August	**1400**	Demonstration: Oceanography by Dr. T. F. Gaskell
	2000	International Evening at the Carisbrooke Hall
Saturday 6 August	**1000**	Lecture by Dr. Barnes Wallis, F.R.S.
Sunday 7 August		Optional excursions
Monday 8 August		Visits to Scientific and Technological Establishments
	2000	Topics for Tonight—discussions in Halls of Residence
Tuesday 9 August	**1000**	Reports on Topics for Tonight
	1400	Teach In: "The Challenge—Your Responsibilities."
	1600	Closing Ceremony
	2000	Farewell Dance at the Empire Rooms
Wednesday 10 August		Departures

Unless otherwise stated all events will take place at the Institution of Electrical Engineers, Savoy Place, London, WC2



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Denmark	Poland
France	Portugal
Greece	South Africa
Germany	Sweden
Great Britain	Switzerland
India	United States of America
Ireland	
Israel	
Italy	

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SCIENTIFIC VISITS

Beecham Research Laboratories, Betchworth

Research in pharmaceuticals—particularly penicillin and fermentation chemistry. Allergy research and research in new drugs of a purely chemical nature.

British Aircraft Corporation (Operating) Ltd.

Manufacturers of Civil Airliners including the V.C.10 and S.A.C. One Eleven.

British Coal Utilization Research Association

One of Britain's largest research associations with a staff of over three hundred.

British Petroleum

(a) B.P. Refinery (Kent) Limited

With the capacity to process over 10 million tons of crude oil a year the Kent refinery is the largest wholly owned refinery in the BP group and processes a full range of petroleum products.

(b) B.P. Research Centre, Sunbury

The main Research Centre for the whole of the B.P. group of companies. Research covers all aspects of the petroleum industry, from exploration for new gas or oil reservoirs, through the many processes that lead to a very wide variety of chemicals and refined products.

Chester Beatty Research Institute

Together with the Royal Cancer Hospital's physics and radio therapy department forms part of the Institute of Cancer Research.

Esso Petroleum Company Limited

(a) Esso Research Limited, Abingdon

Petroleum products and chemicals research for Esso companies in Great Britain, Europe and North America.

(b) Esso Refinery, Fawley

The Refinery is located on the south-western shore of Southampton Water. The refinery has a capacity of nearly 12 million tons per year and is the largest in the United Kingdom. It represents an investment of over £90 million and employs about 2,700 people.

General Post Office

Research Station, Dollis Hill

Carries out basic research and development work on communications systems and techniques, materials and components.

Post Office Tower

The Tower is 620 feet high and from the public observation galleries near the top the panorama of London may be seen. Provides microwave radio channels which carry telephone calls and television programmes to all parts of the country, and will eventually provide 150,000 simultaneous telephone conversations and 40 television channels.

Hawker Siddeley Aviation Limited

Constructors of Civil and Military Aircraft.

I.B.M. United Kingdom Ltd.

Visit to the London Data Centre. There will be an opportunity to programme the I.B.M. 7094—one of the world's largest computers.

Imperial Chemical Industries, Paints Division

Visit to Factory and Research Unit at Slough.

Kodak Limited

The factory at Harrow is the principal plant of Kodak in Britain producing many different kinds of films, plates and sensitized paper. The new Photographic Museum completed in 1966 contains many unique exhibits.

National Institute of Medical Research

The Mill Hill establishment is the principal centre of the Medical Research Council.

Rank Data Systems (Xeronic)

Xeronic—the world's fastest business computer output printer—creates the stationery as well as printing the information received from the computer. By computer instruction it prints the form required from a selection of 32, and also the variable data at a speed of 7,000 characters/second or 80 sq. ft. of documents per minute.

Shell Refining Company Ltd.

Shell Haven Refinery, one of Shell's two largest and most modern refineries in the United Kingdom. It covers over 500 acres and has a processing capacity of 9·35 million tons of crude oil each year.

Shell Research Ltd.

(*a*) A visit to Egham Industrial Chemicals Laboratory, to see research, development, and technical service work on the uses of chemicals from petroleum.

(*b*) Woodstock Agricultural Research Centre, in Kent, is the headquarters for the agricultural research carried out in Europe for companies in the Royal Dutch/Shell Group.

Unilever

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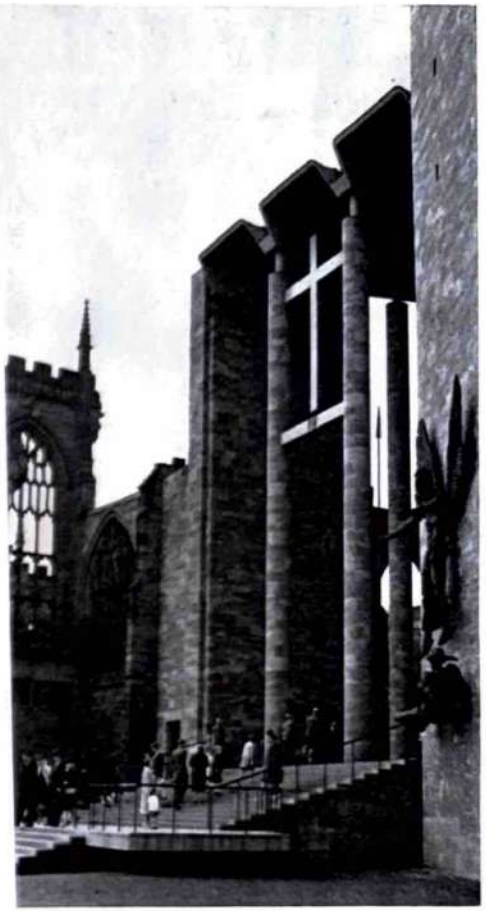
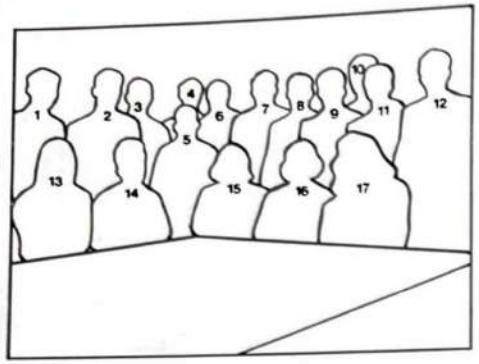


DAY OUT—COVENTRY

On Wednesday 3 August the entire Fortnight will visit Coventry. During the course of the day there will be visits to local industries and an opportunity to visit the Cathedral and the re-developed city centre.

The assistance and co-operation of the Industrial Chaplains of Coventry Cathedral in making this day possible is gratefully acknowledged. The following firms will be visited during the course of the day:

Alvis Limited
Bristol-Siddeley Engines Limited
Courtaulds Limited
Dunlop Rim and Wheel Company Limited
General Electric Company (Electronics) Limited
General Electric Company (Telecommunications) Limited
Jaguar Cars Limited
Motor Panels (Coventry) Limited
Standard-Triumph Sales Limited
Wickman Machine Tool Manufacturing Company Limited



These are your Couriers and Hosts

1. William Savage
2. Andrew Bisset
3. Morris Chudleigh
4. Richard Gledhill (*Head Courier*)
5. Viji Thambyrajah
6. Graham Richards
7. Harry Carlo
8. Colin West
9. Roger Mulberge
10. Bryan Massam
11. Austin Kinsella
12. George Austin
13. Rosalind Johnson
14. Frances Neal
15. Susan Gledhill
16. Irene McCormack
17. Anna Jennings

Not in photograph: Rosemary Cathels

Hosts and Hostesses

Commonwealth Hall
Graham Richards and Roger Mulberge
Passfield Hall
Bryan Massam and Rosemary Cathels
Bentham Hall
Irene McCormack
Northampton Hall
Harry Carlo

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Jaguar Cars Limited
Motor Panels (Coventry) Limited
Standard-Triumph Sales Limited
Wickman Machine Tool Manufacturing Company Limited

PROGRAMME NOTES

TOPICS FOR TONIGHT

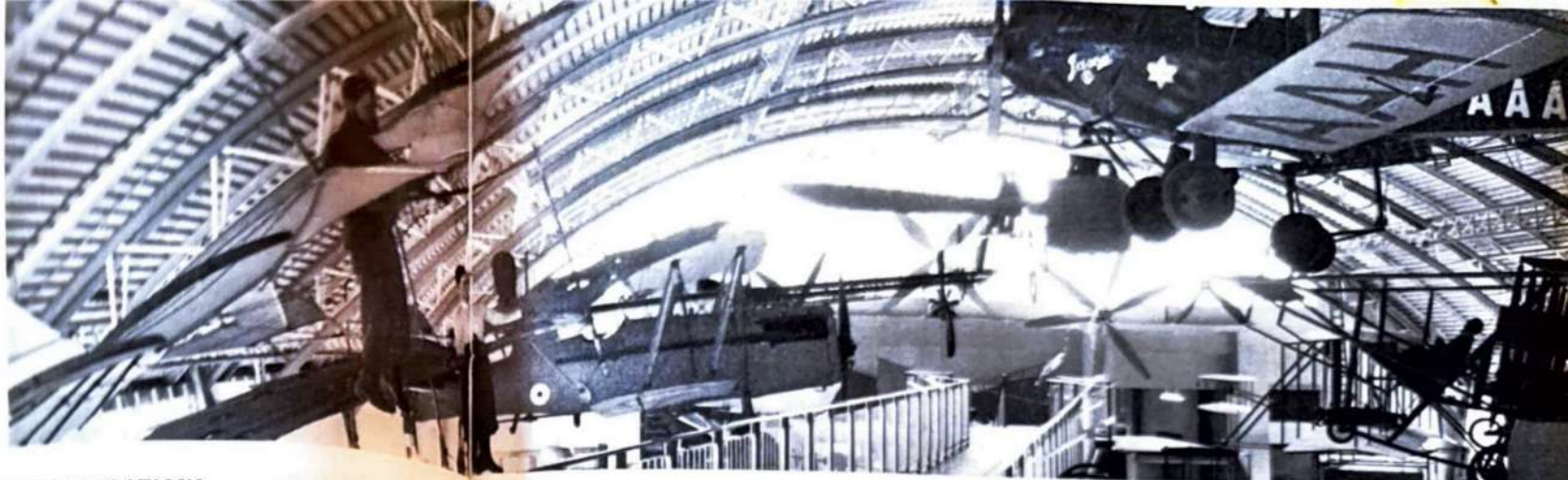
[illegible] "Topics for Tonight" is to promote [illegible] on a variety of subjects ranging over a wide [illegible] will run simultaneously and details [illegible] will be available in each Hall. Participants will [illegible] select subjects which are of greatest personal [illegible]

[illegible] will be introduced briefly and conducted by the [illegible] as detailed below. Reports from each [illegible] will be given during the morning session on 9 August.

SEMINARS

[illegible] have been arranged to take place on [illegible] August. Details of the venues and the allocation of [illegible] will be individually advised.

SEMINAR A PHYSICS	"Interstellar Communications", led by Dr. D. K. Butt
SEMINAR B PHYSICS	"Magic and Science", led by Mr. C. Ronan
SEMINAR C CHEMISTRY	"Metals and Man Made Organic Chemistry", led by Mr. M. D. Johnson
SEMINAR D BIOCHEMISTRY	"The Structure and Functions of Biological Macro Molecules", led by Dr. B. R. Rabin and Dr. A. P. Matthias
SEMINAR E BIOLOGY	"Physiological Ecology of Helminth Parasites", led by Mr. M. M. Walkey
SEMINAR F MATHEMATICS	"Mathematical Models", led by Professor J. Crank
SEMINAR G ENGINEERING	"Engineering and its Challenge" led by Dr. P. A. Lindsay
SEMINAR H GEOLOGY	"Elementary Particles in the Service of Man" led by Mr. M. Longstaff



DEMONSTRATIONS

28 July 1966

"The Application of Biochemistry in Engineering"

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5 August 1966

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An introductory lecture will be given to each group visiting the Museum and technical enquiries will be dealt with by staff. Participants visiting the Museum privately may like to make use of the Museum's Information Office for help with any special interests.

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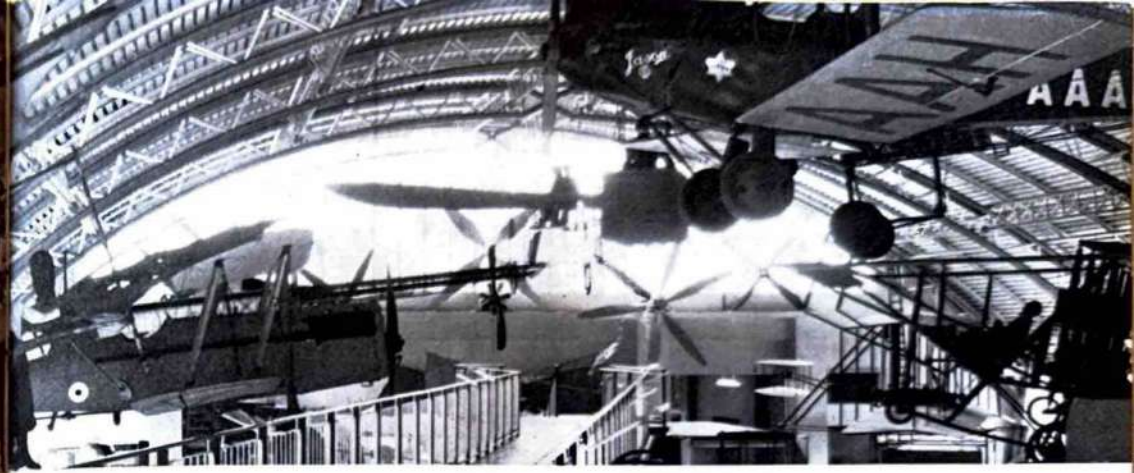
PROGRAMME NOTES



TOPICS FOR TONIGHT

The aim of the Monday evening sessions in Halls of Residence under the general heading of "Topics for Tonight" is to promote informal discussions on a variety of subjects ranging over a wide field of interests. Four sessions will run simultaneously and details of the "Topics" will be available in each Hall. Participants will therefore be able to select subjects which are of greatest personal interest.

The discussions will be introduced briefly and conducted by the Leaders of the Seminars, as detailed below. Reports from each "Topic" will be given during the morning session on 9 August.

SEMINARS

The following Seminars have been arranged to take place on Monday 1 August. Details of the venues and the allocation of participants to each seminar will be individually advised.

SEMINAR A	PHYSICS	"Interstellar Communications", led by Dr. D. K. Butt
SEMINAR B	PHYSICS	"Magic and Science", led by Mr. C. Ronan
SEMINAR C	CHEMISTRY	"Metals and Man Made Organic Chemistry", led by Mr. M. D. Johnson
SEMINAR D	BIOCHEMISTRY	"The Structure and Functions of Biological Macro Molecules", led by Dr. B. R. Rabin and Dr. A. P. Matthias
SEMINAR E	BIOLOGY	"Physiological Ecology of Helminth Parasites", led by Mr. M. M. Walkey
SEMINAR F	MATHEMATICS	"Mathematical Models", led by Professor J. Crank
SEMINAR G	ENGINEERING	"Engineering and its Challenge", led by Dr. P. A. Lindsay
SEMINAR H	GENERAL	"Elementary Particles in the Service of Man", led by Mr. M. Longstaff

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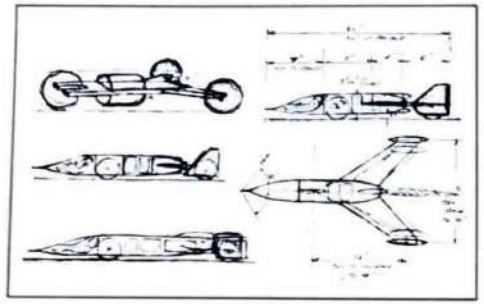

IN THE LAST ISSUE OF 'SCIENCE & TECHNOLOGY' we looked at the design of high-speed land vehicles and printed hitherto unpublished sketches of what could be the first car to break the sound barrier.

THE CURRENT ISSUE has for its main feature a review of what goes on inside the Metropolitan Police Forensic Science Laboratory. 'Forensic' means 'pertaining to the law'. This is front line reporting from the war on crime.

HOW SCIENTIFIC IS THE SUPERNATURAL? In the next issue, 'Science & Technology' explores the twilight world of mystery and imagination. Is there any scientific basis for a belief in ghosts, and if so, can modern scientific equipment help the psychical research investigator? The Autumn 'Science & Technology' considers the available evidence.

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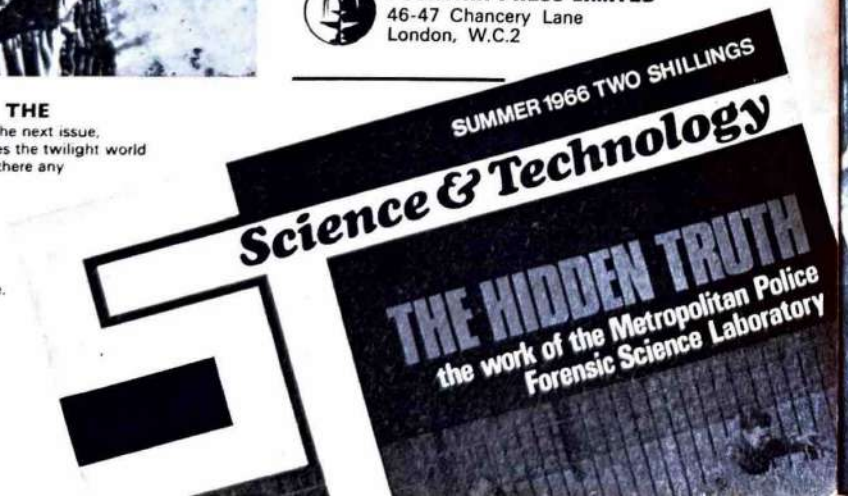

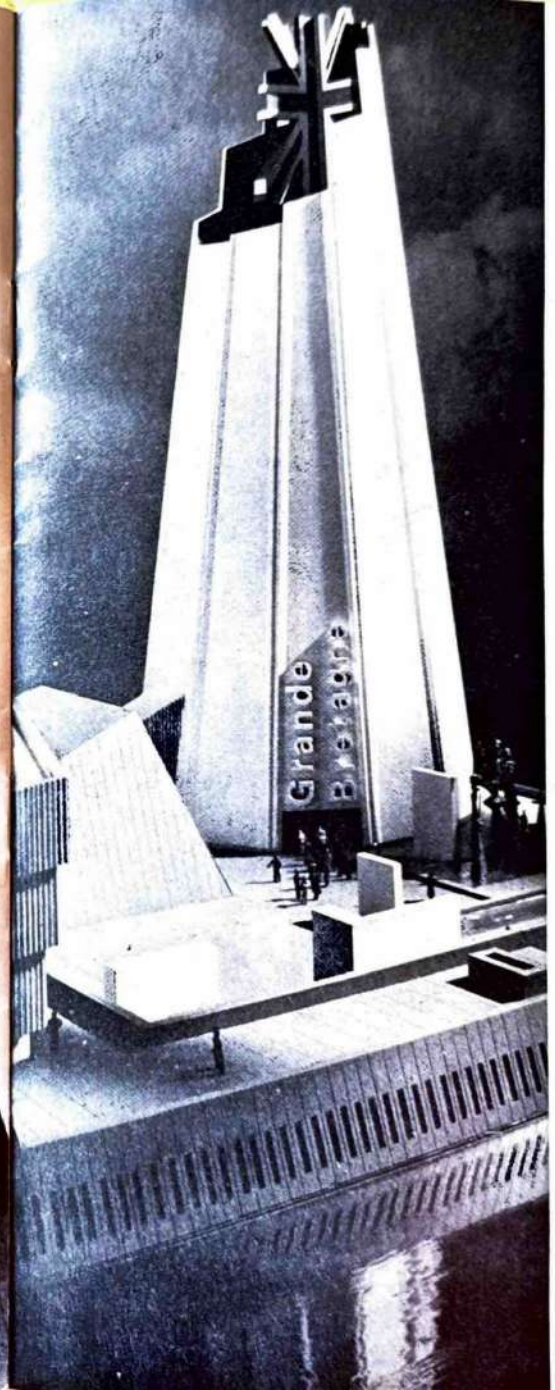

THE EUROPEAN TOUR FOR YOUNG SCIENTISTS

On 12 August 1966 the group will depart from London for Ostende, Brussels, Strasbourg, Interlaken, Innsbruck, Vienna, Prague, Berlin, Hanover and Amsterdam.

During the three-week tour meetings will take place with science and other students in the countries visited. There will be visits to Factories and Laboratories as well as opportunities for sightseeing.

The Highlight of the Tour will be a week-end Conference in Berlin where German students will join this international group to discuss "The Social Implications of Science".

The Berlin Conference is being organized in consultation with the Deutsche-Englische Gesellschaft, Landesgruppe Berlin.

Details of the 1967 European Tour will be available on request during October 1966.

The Ninth London International Youth Science Fortnight

The 1967 Fortnight will take place in London between 26 July and 9 August. It will be followed by a European Science Tour and

A Week of Scientific Youth at Expo '67 in Montreal

This event which will be organized by the Youth Science Foundation of Canada in consultation with the organizers of the Science Fortnight and other similar organizations will be based on the Canadian Centenary World Fair (Expo '67) and will bring together participants from all parts of the world.
Details of the project will be made available to participants during the Fortnight and a final programme and budgeted itinerary will be available during October 1966.
It is planned to combine a visit to the Week of Scientific Youth with a Science Tour of Canada and North America which will last for some two weeks.

Sponsoring Authorities

England

Bedfordshire Education Committee
City of Birmingham Education Committee
Bristol Education Committee
Cornwall Education Committee
Cumberland Education Committee
Borough of Derby Education Committee
Derbyshire Education Committee
Devon Education Committee
Dorset Education Committee
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Hampshire Education Committee
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Lancashire Education Committee
The Leathersellers' Company
Leicestershire Education Committee
Lincolnshire (Kesteven) Education Committee
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Northumberland Education Committee
Nottinghamshire Education Committee
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Northern Ireland

The Ministry of Education in association with the Education Committees of the Counties of:
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Belfast Borough
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Down
Fermanagh
Londonderry
Londonderry Borough
Tyrone

Wales

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Cardiganshire Education Committee
Carmarthenshire Education Committee
Glamorgan Education Committee
Marioneth Education Committee
Monmouthshire Education Committee
County Borough of Newport Education Committee
Pembrokeshire Education Committee
Radnorshire Education Committee

BRITISH SCHOOLS & COLLEGES PARTICIPATING IN 1966

Aberdeen Academy
Aberdeen Grammar School
Aberdeen High School for Girls
Abersychan Grammar Technical School, *Pontypool*
Albert Senior Secondary School, *Glasgow*
Aldershot County High School
Allerton Grange School, *Leeds*
Amman Valley Grammar School, *Ammanford*
Ardrossan Academy, *Ayrshire*
Ardwyn Grammar School, *Aberystwyth*
Ashton-under-Lyne Grammar School
Bargoed Grammar/Technical School
Bathgate Academy, *West Lothian*
Batley Grammar School
Beath High School, *Cowdenbeath*
Bedford School
Bedford High School
Bell Baxter High School, *Cupar*
Bishop Fox's Girls' Grammar School, *Taunton*
Bishop Wordsworth's School, *Salisbury*
Blandford Grammar School
Blyth Grammar School
Boroughmuir Secondary School, *Edinburgh*
Bourneville Boys' Technical School, *Birmingham*
Brecon Grammar School
Brecon County Grammar School for Girls
Broughton Senior Secondary School, *Edinburgh*
Broxburn Academy, *West Lothian*
Brune Park County High School, *Gosport*
Brynmawr Comprehensive School, *Breconshire*
Buckhaven High School, *Fife*
Builth Wells County Grammar School, *Brecknockshire*
Camphill Secondary School, *Paisley*
Central College of Commerce and Distribution, *Glasgow*
City of Worcester Grammar School for Girls
Coatbridge High School, *Lanarkshire*
Colne Valley High School
Dalziel High School, *Motherwell*
Deacon's School, *Peterborough*
Derby School
Dorchester Grammar School for Girls
Dumbarton Academy, *Dunbartonshire*
Dunfermline High School
Eastbank Academy, *Glasgow*
Eastwood High School, *Glasgow*
Fakenham Grammar School
Falkirk High School
Farnborough Grammar School
Foster's Grammar School, *Sherborne*
Fowey Grammar School
George Green's Grammar School, *London*
Glasgow College of Printing
Glenwood Secondary School, *Glasgow*
Goatbridge High School
Godolphin & Latymer Girls' School, *London*
Gowerton Boys' Grammar School, *near Swansea*
Great Yarmouth Technical High School
Greenock Academy
Greenock High School
Hackney Downs Grammar School, *London*
Hawick High School, *Roxburghshire*
Haydon Bridge Technical School, *Northumberland*
Heversham Grammar School, *Westmorland*
Homelands Grammar School, *Derby*
Hornchurch Grammar School
Huntingdon Grammar School
Hyndland and David Dale College, *Glasgow*
Ilminster Girls' Grammar School
Jersey College for Girls, *Channel Islands*
John Neilson Institution, *Paisley*
Johnstone High School, *Renfrewshire*
Kilmarnock Academy
Kingsbridge Grammar School, *Glasgow*
King Edward VII School, *King's Lynn*
King Edward VII Grammar School, *Totnes*
King's High School for Girls, *Warwick*
King's School, *Grantham*
King's School, *Ottery St. Mary*
Kircaldy High School, *Fife*
Langside College, *Glasgow*
Lewis School for Girls, *Ystrad Mynach, Glamorgan*
Linlithgow Academy, *West Lothian*
Llandrindod Wells Grammar School
Llanelli Girls' Grammar School
Lockleaze School, *Bristol*
Logan and Johnston College, *Glasgow*
Lord Digby's School, *Sherborne*
Luton Secondary Technical School
Madras College, *St. Andrews*
Maesydderweh Comprehensive School, *Ystradgynlais*
Market Harborough Grammar School
Mayfield School, *London*
Monkwearmouth School, *Sunderland*
Morgan Academy, *Dundee*
Morpeth Girls' Grammar School
Newbridge Grammar School, *Monmouthshire*
Northgate Grammar School for Boys, *Ipswich*
Northgate Grammar School for Girls, *Ipswich*
North Kelvinside Secondary School, *Glasgow*
North Walsham Girls' High School
Ogmore Grammar School, *Glamorgan*
Paisley Grammar School
Parkfields Cedars Grammar School for Girls, *Derby*
Pembroke Grammar School
Plymstock Grammar School
Pontardawe Grammar School
Pontypool Grammar School for Girls
Portobello Secondary School, *Edinburgh*
Prendergast Grammar School, *London*
Presteigne Grammar School
Purbrook Park County Grammar School, *near Portsmouth*
Quarry Bank High School, *Liverpool*
Queen Eleanor's School, *Dunstable*
Queen Elizabeth's Grammar School, *Blackburn*
Queen Elizabeth's Grammar School, *Middleton*
Queen Elizabeth's Girls' Grammar School, *Mansfield*
Queen Elizabeth's School, *Crediton, Devon*
Queens Park Secondary School, *Glasgow*
Redruth County Grammar School
Regent Street Polytechnic, *London*
Reigate Grammar School
Rhondda County Grammar School
Rodway Technical High School, *Bristol*
Royal Grammar School for Girls, *Clitheroe*
Royal High School, *Edinburgh*
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St. Columba's High School, *Greenock*
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St. Leonards School, *St. Andrews*
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St. Mirin's Academy, *Paisley*
St. Modan's High School, *Stirling*
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St. Ninian's High School, *Kirkintilloch*
St. Patrick's High School, *Dumbarton*
St. Thomas of Aquin's Secondary School, *Edinburgh*
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Sherwood Hall Technical Grammar School for Girls, *Mansfield*
Skinners' Company's School, *London*
Sleaford County Secondary School, *Lincs.*
South Devon Technical College, *Torquay*
Stepney Green School, *London*
Stirling High School, *Stirlingshire*
Stow College of Engineering, *Glasgow*
Tasker's School for Girls, *Haverfordwest*
Thornbury Grammar School, *Gloucester*
Thorpe Grammar School, *Norwich*
Torquay Girls' Grammar School
Totnes High School
Trinity Academy, *Edinburgh*
Uppingham School
Vaynor Pend Peneryn School, *Cefn Coed, Brecon*
Victoria College, Jersey, *Channel Islands*
Waid Academy, *Anstruther*
West Bridgford Grammar School
Weston-super-Mare Boys' Grammar School
Whitchurch Grammar School, *Cardiff*
Whitehaven County Grammar School
Whitley Bay Grammar School
Wimbledon College, *London*
Worthing High School for Boys
Worthing High School for Girls
Worthing Technical High School
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Ysgol Ardudwy, *Harlech*
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"We ask and ask," wrote Matthew Arnold, many years before Shell was a name with a capital S. That's the way it is, and that's the way it's going to be over the years ahead, until you'd think there could be no more questions left to ask.

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The complexity of the tasks facing the Corporation has demanded the adoption of modern techniques of management and the widespread use of advanced computers for both technical and commercial purposes.

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hopes that you will derive great benefit from the International Youth Science Fortnight in London, and that you will identify the Company with all that is best and enduring in modern physical sciences and technology.

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Unilever Research Laboratory, Colworth (Aberdeen), Greyhope Road, Aberdeen, Scotland.

Unilever Research Laboratory, Port Sunlight, Cheshire.

Unilever Research Laboratory, 455 London Road, Isleworth, Middlesex.

Unilever Research Laboratory, The Frythe, Welwyn, Herts.

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The Perkins Group of Companies offers excellent careers in the design, development, manufacture and sale of high-speed diesel engines. Perkins is part of the Massey-Ferguson organisation and is one of the largest manufacturers in the world of lightweight, high-speed diesel engines. Over 85 per cent of the production is exported, directly or indirectly, to markets all over the world and the engines are used in all types of vehicles, agricultural machinery, industrial applications and motor boats.

LOCATION
There are three factories in Peterborough, the big Eastfield plant being one of the most up-to-date in Europe. The Group has worldwide connections and there are associated or subsidiary companies in the United States of America, France, Brazil, Argentina, South Africa, Australia, Italy, Germany, India, and Spain.

In order to meet the increasing demand for men capable of holding positions of responsibility caused by the expansion of the company the following apprenticeships are offered:

Undergraduate: Boys qualified for university entry are accepted for a year's industrial training before going up and for training in the vacations. The normal two-year post-graduate training is thus reduced to one year. Bursaries of £100 per year are paid whilst at the university.

Student Engineer: Minimum qualifications are passes in G.C.E. at 'A' level in mathematics and physics and at 'O' level in English language. Chemistry at 'O' level is also desirable. These apprentices will take 'thin sandwich' courses leading to either the B.Sc. or other C.N.A.A. degrees. Bursaries of up to £100 per year are paid whilst at college.

Successful students are granted exemption from some or all of the examinations of the Institutions of Mechanical, Production or Electrical Engineers.

TRAINING
Apprentices are given basic practical training under skilled instructors in the company's well-equipped Apprentice School and in the departmental workshops. Later training is carried out by means of special projects under the direct supervision of Heads of Departments arranged by the Training Staff. Some of these may be in the Overseas Companies.

A system of controls ensures that all apprentices do in fact acquire the necessary skills and knowledge.

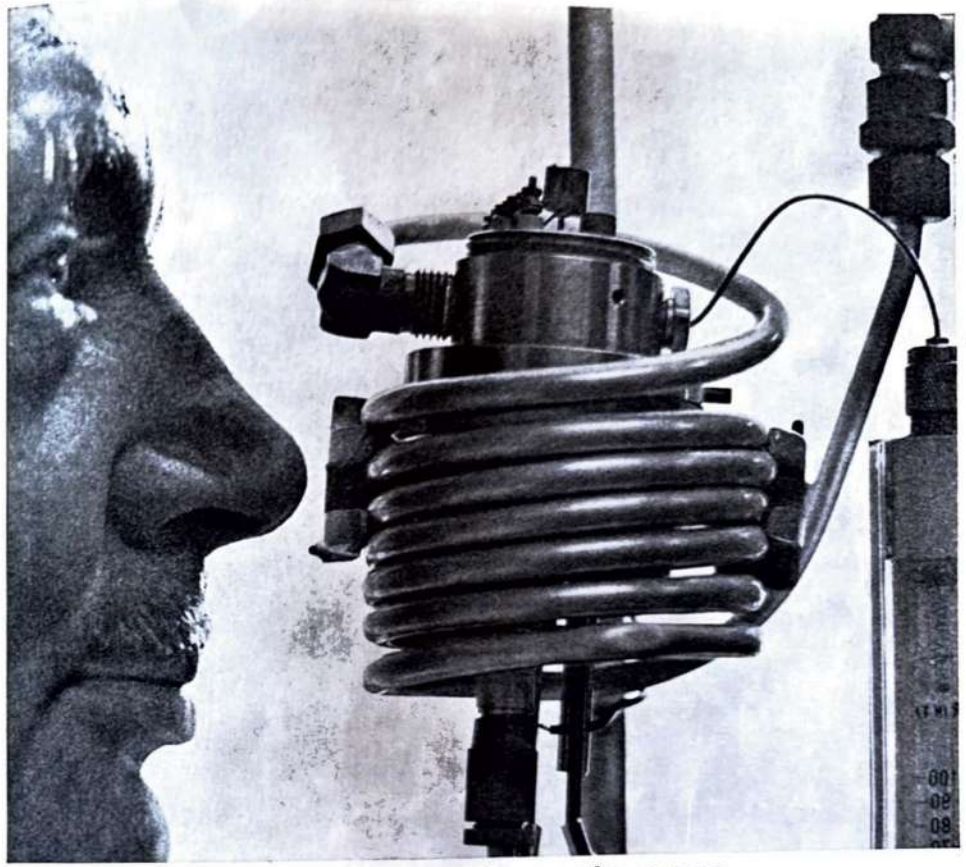
After appointment to a staff position Management Succession Planning ensures that all qualified men who have got the right potential are given the experience necessary to fill the more senior posts in the company.

SALARIES
Vary according to age from £10 11s. 0d. at 17 to £17 3s. 9d. per week at 23.

ENTRIES
There is one entry per year in September for which applications should be made in good time. Boys are accepted provisionally before the results of the G.C.E. are published, subject to their obtaining the necessary qualifications.

AMENITIES
There are excellent sports and social facilities including an active Apprentice Association.

Applications and requests for more information should be made to:
Apprentice Training Manager, The Perkins Manufacturing Co., Peterborough



Nose... meets... automatic nose

AS ANY DOG WILL TELL YOU, the human nose is a sensitive but imprecise instrument. In other words your nose can pick up a "scent" but not discriminate between scents, as a bloodhound can.
But even a prize bloodhound would not be able to equal the degree of discrimination of the apparatus in the picture. Called a gas Chromatograph, it is used by Metal Box Packaging Research to determine the characteristics of aromas.
Where the packaging of food is concerned purity of aroma is, naturally a primary consideration. Very slight traces of certain vapours—as slight as a few parts in a million in some cases—can be detected by some superior human noses. But the automatic nose not only sniffs, it also separates and records the constituents of what it sniffs. Gas chromatography is just one of many research tools used by Metal Box to control the quality of packaging.
Physicists, chemists, biologists, and food technologists are also engaged in developing new forms of Metal Box packaging—not just in metal but in plastics and paper too.
In fact the whole range of graduate skills is now needed in an industry whose products are part of the way of life of every member of the community.

Metal Box—brief facts

Leading manufacturer of packaging in metal, paper and plastics.

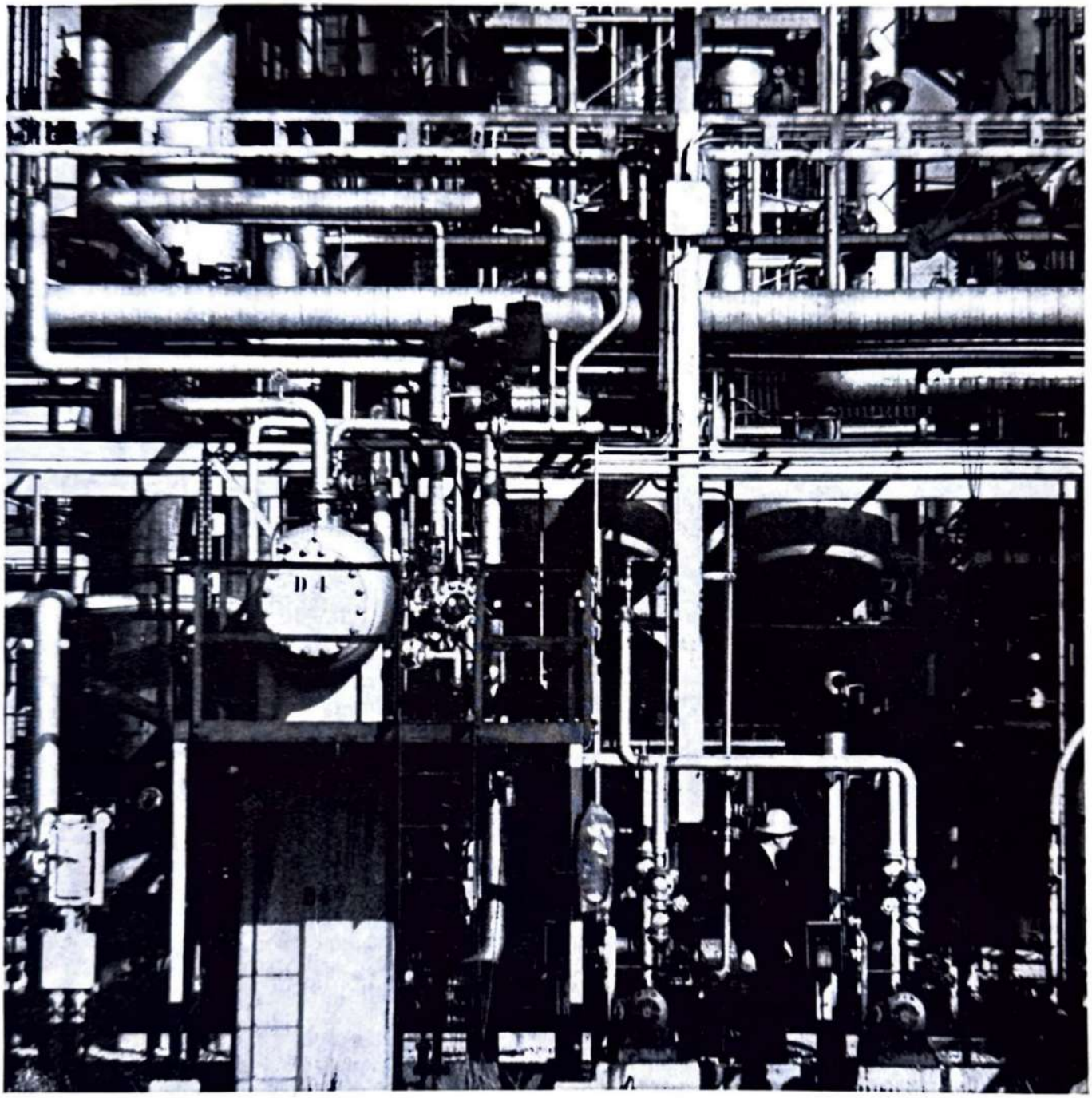
A fast growing light engineering and marketing organization. 40 factories in Britain. 32 overseas.

A research team of over 300 continuously engaged in a wide range of projects involving food technology, physics, chemistry and microbiology.

A youthful and vigorous industry with tremendous potential for the future.

There's more to METAL BOX than metal boxes
—they're leaders of research into metal, paper and plastic packaging

MB810-101C



PUZZLE...FIND THE MAN

Finding the right man—for each of the many key technical opportunities that occur each year—is one of our most vital management functions.

For the challenge of the oil industry today lies in its complexity and dynamism. Effort is constant to achieve higher productivity by grafting the latest scientific advances on to the highly complicated processing sequence. There are no short cuts, and the progress of the industry and this Company is based upon the individual achievements of its employees.

PS By the way, our man is working on the polymerisation plant at the Fawley refinery.

ESSO

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