

Chemical Age

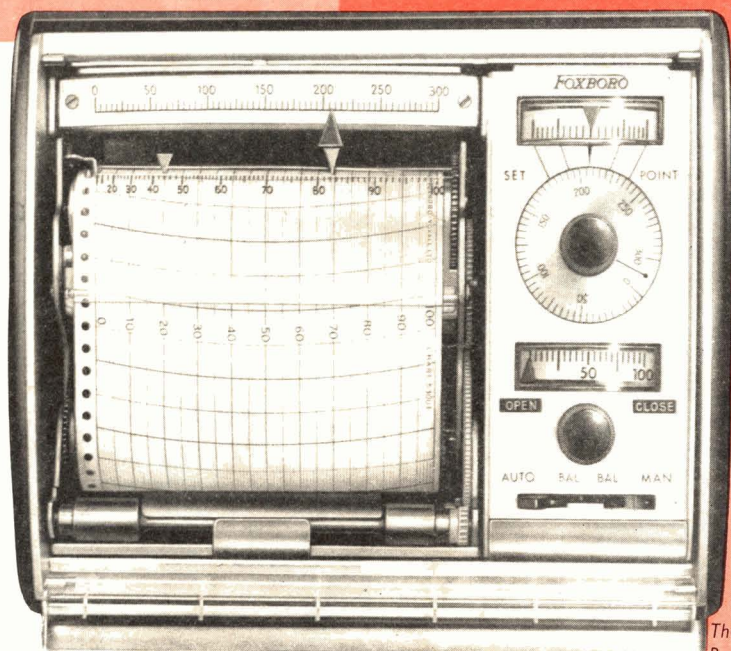
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21 OCTOBER 1961

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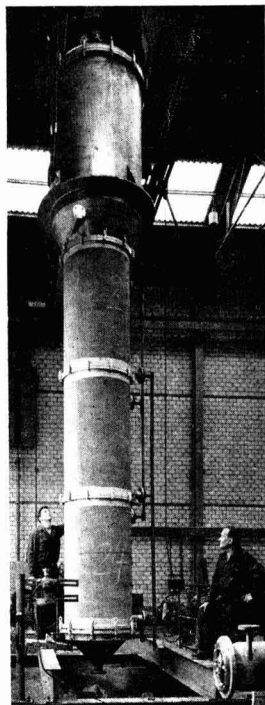
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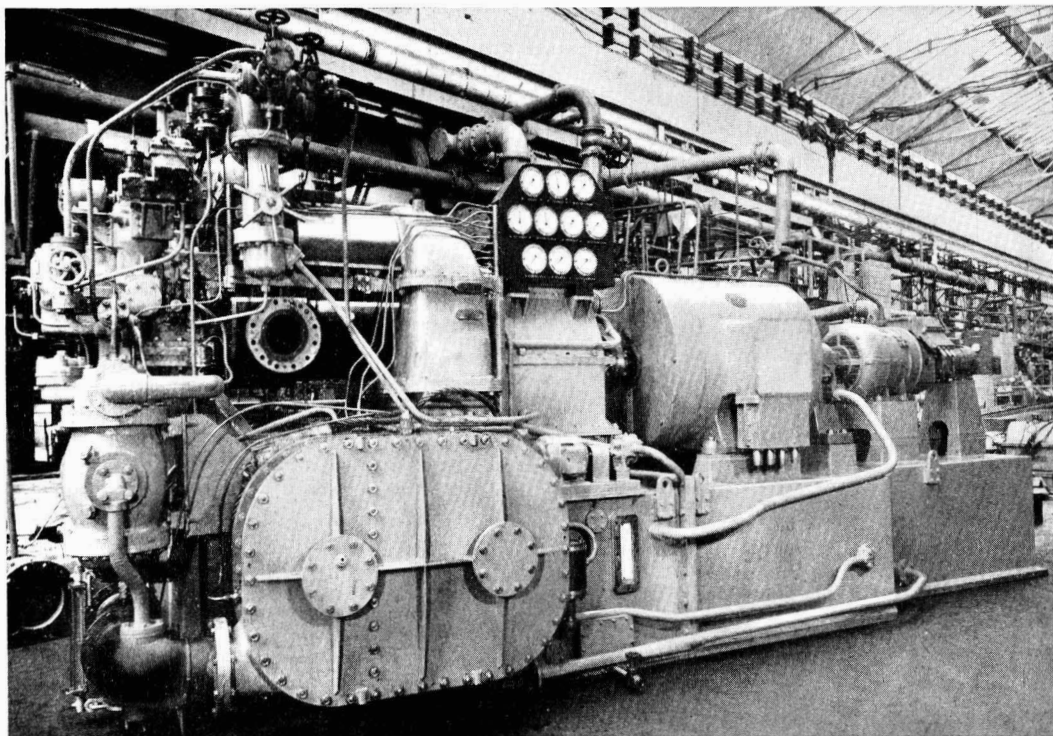
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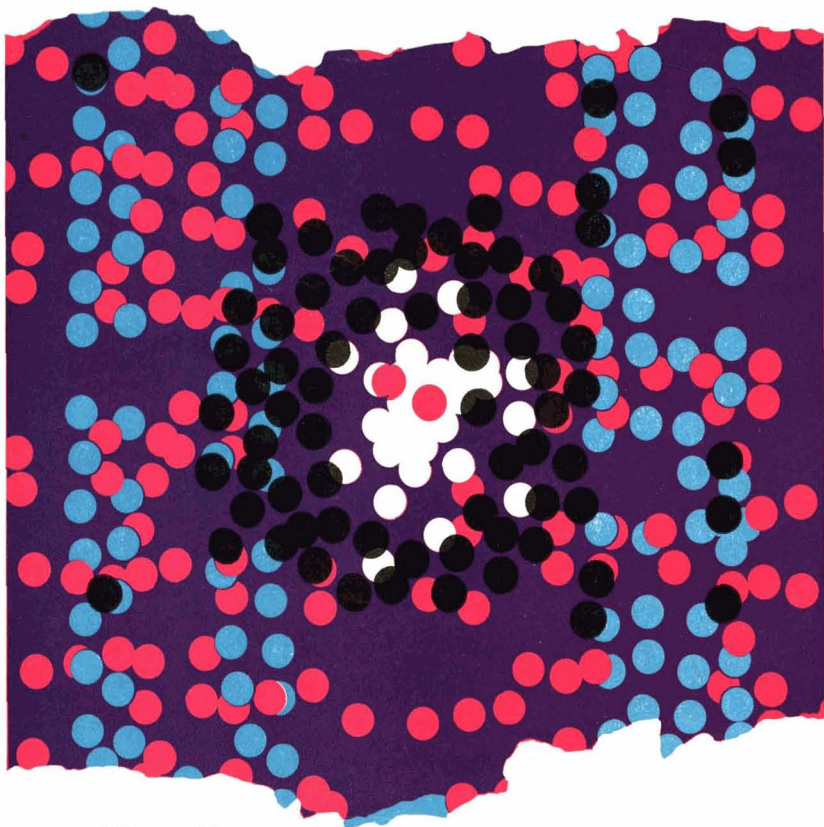
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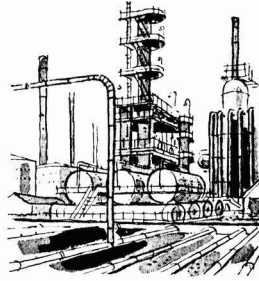
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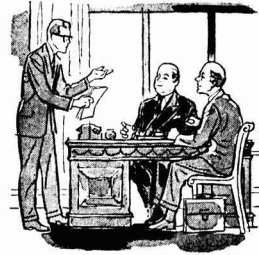
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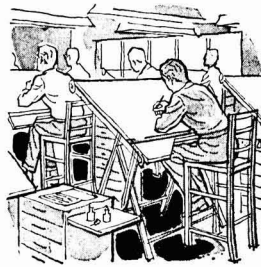


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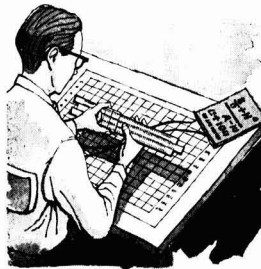


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Araldite epoxy resins are used

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- for producing glass fibre laminates.
- for producing patterns, models, jigs and tools.
- as fillers for sheet metal work.
- as protective coatings for metal, wood and ceramic surfaces.
- for bonding metals, ceramics etc.



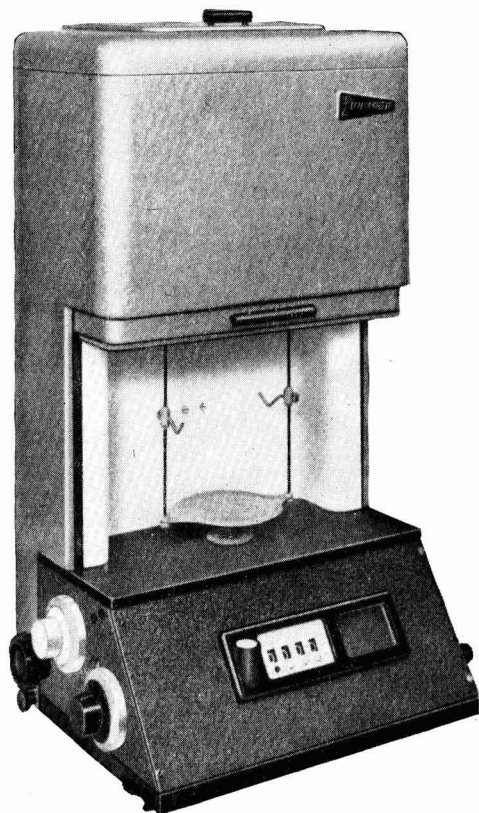
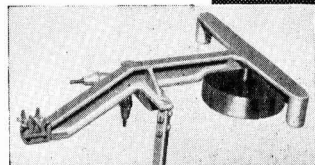
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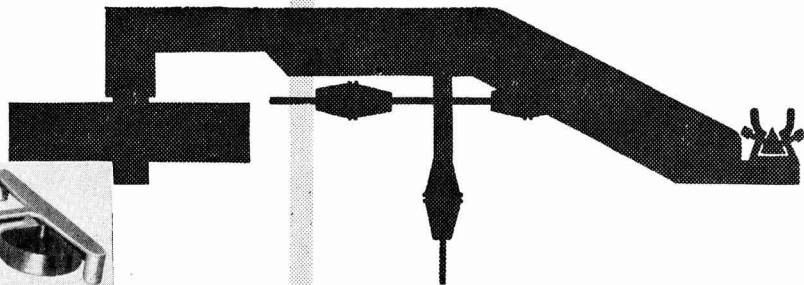
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into the design of their UNIMATIC single pan balance. After exhaustive experiments and tests they are now able to offer the balance based upon the principle of weighing by substitution as an alternative to the already well established equal arm "Ultramatic" balance. The new Model avoids errors due to inequality of lever arms and slight variations in sensitivity due to major changes in load.

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THE BEAM is pressure die-cast of a special alloy in H section and it is buoyancy corrected and stress relieved.

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CONTROLS are grouped conveniently at bench level allowing even unskilled persons to acquire speed of weighing easily and quickly.

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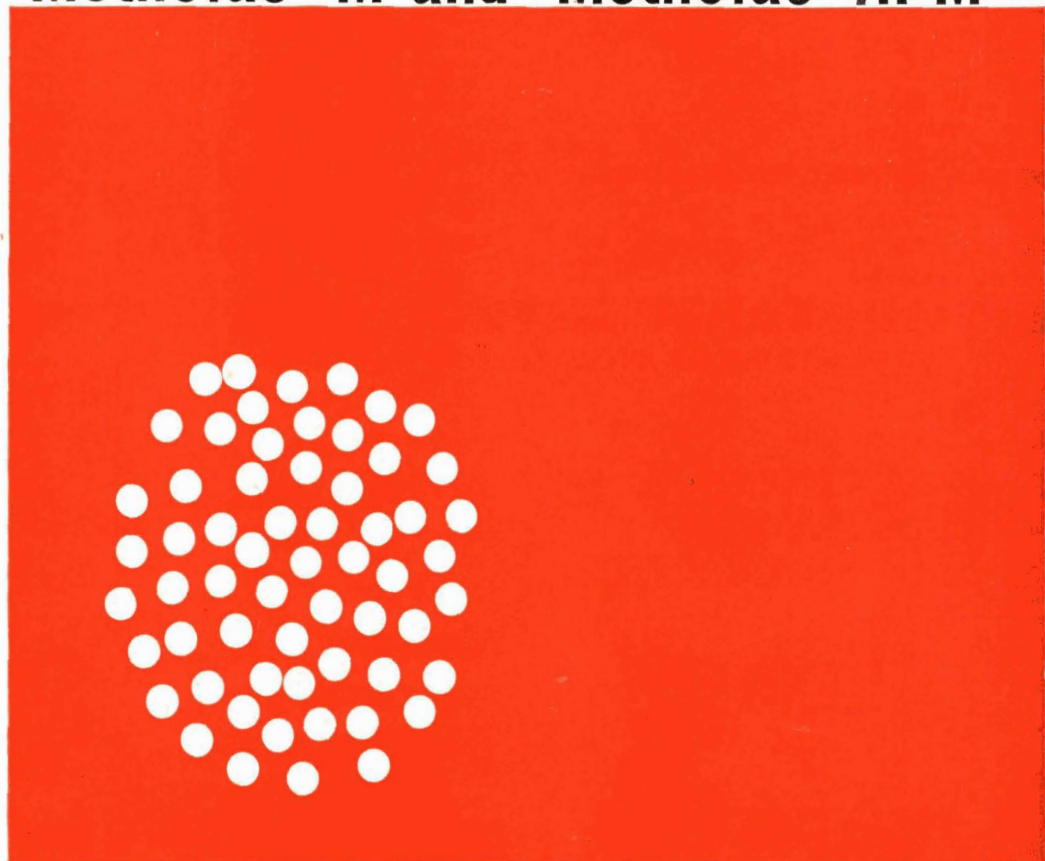
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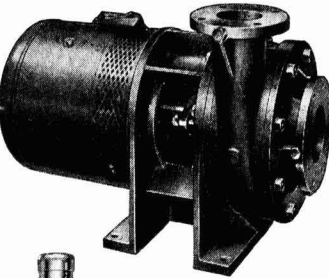
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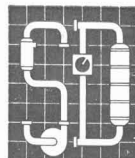
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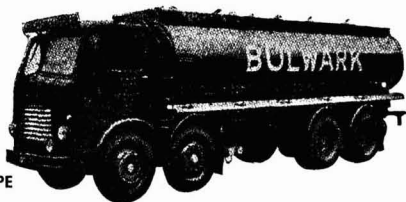
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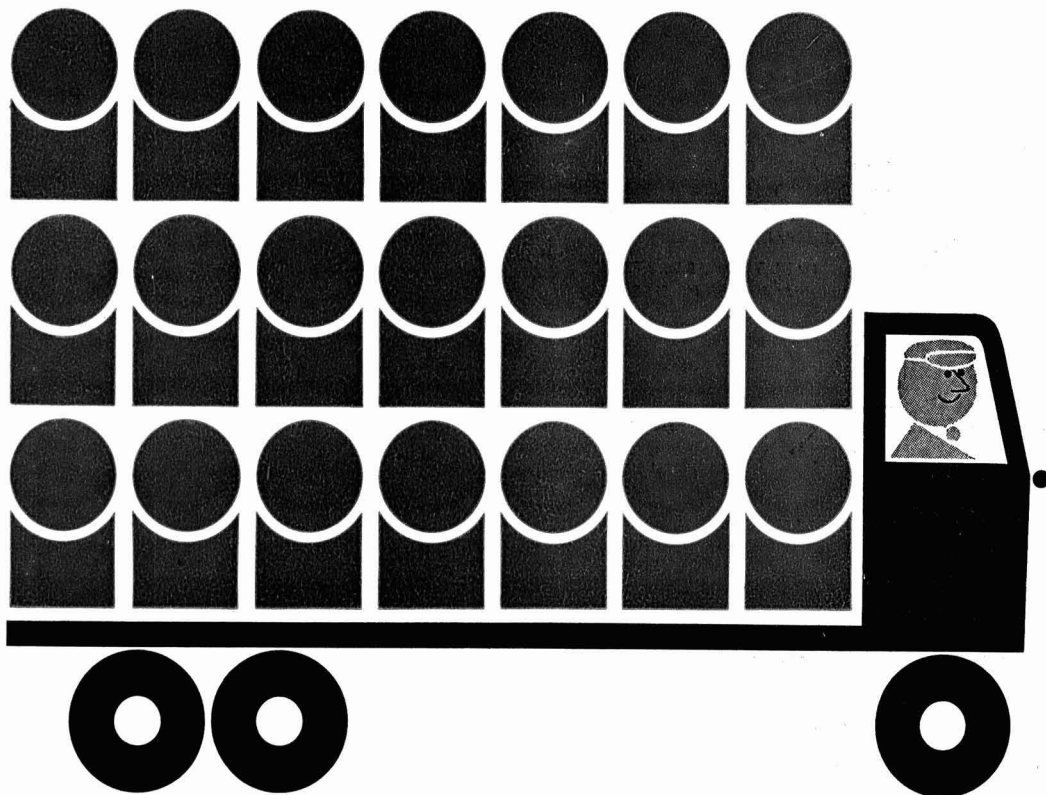
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SCIENTIFIC MANPOWER

IT would be unwise to see grounds for complacency in the latest findings of the Government's Committee on Scientific Manpower, who have forecast that the supply and demand for scientists and technologists in U.K. industry will reach something like equilibrium by 1965, with the further possibility of a surplus of qualified people by 1970. In the first place, juggling with the possible future output of universities and colleges and trying to equate this output with industry's future needs by available methods is a very dubious exercise; indeed, the committee's report is hedged about with qualifying statements. In the second place, industry's future needs in scientific manpower are as much a matter of quality as of quantity, and gauging the likely relationship between quality and quantity five or 10 years hence calls for a much more intensive survey of both industrial needs and educational facilities than has hitherto been possible. 'Industrial needs', even as applied to the present time, is itself a nebulous phrase; in view of the allegations made by some that industry is not making sufficient use of available scientific manpower, who can say what is best for industry as against what industrial management seems to want?

It is also questionable how much can be gained by making direct comparisons of the scientific manpower situation in the U.K. with that in other countries. Thus, it is forecast that the U.K., with its demands for scientists and technologists fully satisfied will, by 1970, have a little less than two-thirds as many in proportion as the U.S. already had in 1959, and in some industries only half as many. However, Sir Solly Zuckerman, chairman of the committee, has pointed out that comparisons of qualifications between one country and another are notoriously difficult and that, in his opinion, much more confirmation would be needed before further conclusions could be drawn from the figures.

On the basis of a survey by the Ministry of Labour in the chemical and engineering industries, the present discrepancy between the U.K. and the U.S. is comparatively small if qualified manpower and technicians are grouped together. This observation will be of small consolation to the chemical and allied industries, to whom the present shortage of chemical engineers is a very real handicap. However, Sir Solly had some heartening things to say when he spoke at the A.B.C.M. annual dinner last week—for instance, he believes that the U.K. is at present turning out more professional chemists and chemical engineers than the total of all science graduates during the war. He also forecast that, if the average proportion of the qualified manpower of the chemical, oil refining and synthetic fibres industries rises to that of the leading firms at present, then those industries' total employment of qualified manpower will rise, in the course of the next 10 years, from the present level of about 15,000 to some 40,000 or more. By that time, 8% of the payroll would be represented by professionally qualified chemists and chemical engineers, which is the figure as it stands in the U.S. at present.

Even if this is so, the question of quality still remains, and in considering this aspect the adequacy of present educational facilities must be taken into

(Continued on page 622)

A.K.U. Accept Courtaulds' Offer for Enka Shares

COURTAULDS LTD. are making a £1.875 million bid for the capital of British Enka on the basis of 5s for each of the 7.5 million 5s shares. A.K.U. of Holland, who own approximately 54.8% of British Enka shares, have agreed to Courtaulds' terms in respect of their holding, and British Enka directors are recommending that the shareholders accept the offer.

British Enka have been operating at a substantial loss. Bank overdraft and cash borrowing has amounted to £900,000 and shareholders have not received a dividend for the past five years. The chairman, Mr. A. D. Carmichael, who reported in March that the company's operational loss was due to intensive competition from manufacturers of rayon and other synthetic fibres, says that the position has worsened.

Courtaulds already have about 75% of the market for viscose filament yarn. The acquisition of British Enka will give them a further 25 million lb/year in capacity or a further one-sixth of the market (total U.K. production is around 141.5 million lb.).

By making the bid for British Enka,

Courtaulds stand to gain an interest in the newly-formed subsidiary, British Enkalon. A.K.U. have already agreed to subscribe 54.8% of the share capital of the new company; the other 45.2% will be offered to other British Enka shareholders as at 17 October. British Enkalon are shortly to begin construction of a nylon-6 plant, with Matthew Hall as contractors, in Northern Ireland. Courtaulds announced their own plans to make nylon-6 by the Snia Viscosa process in June of this year.

Obituary

Mr. Wilfred Frank Dines, director and general works manager of the Midland Tar Distillers Ltd., died suddenly on 9 October at his home at Penkridge, Staffs. At the age of 59, after spending nearly 20 years in India, Mr. Dines joined The Midland Tar Distillers Limited in 1949 and was responsible for the design and erection of the Company's refinery at Four Ashes. On its completion in 1953 he became the refinery manager until he joined the board at the beginning of 1960.

R.I.C. Revises Consultants' Directory

A NEW edition of the Royal Institute of Chemistry's 'Directory of independent consultants in chemistry and related subjects' has been issued. The directory covers a wide range of consultant services offered by independent practices operated and controlled by fellows or associates of the Institute in Great Britain and Ireland, which are not part of any other organisation.

The general plan of the directory is similar to that adopted in other editions, but the basis of the subject guide has been revised to take account of the increased number and variety of fields of specialisation, and to make it easier to refer to the main section of the directory in finding consultants most likely to help in a particular field.

In introducing the new edition, the president of the R.I.C., Sir William Slater, said that there was a very large place for independent consultants in the structure of the chemical industry. Large firms find it valuable from time to time to seek expert advice on specialised subjects for which their own laboratories and staff may not be equipped to deal. It is also valuable to have an independent check. The time to call in a consultant, Sir William stressed, is at the beginning. The consultant is not just an analyst but an advisor and the time to seek advice is at the outset of an investigation.

Among the 150 practices listed are contained many names well known internationally in their particular field. The

edition has been widely distributed and a copy will be sent free of charge to any concerned with obtaining the services of a consultant.

Monsanto Stage Realistic Fire-fighting Exercise

As part of Monsanto Chemicals Ltd. safety campaign, a realistic fire-fighting exercise was held at the Newport, Mon., works, in conjunction with Newport fire service. The works have a full-time fire fighting team with their own engine, and 36 other workers are also trained firemen.

As part of the exercise two men had to be rescued from the top of the Lustrex department, the highest building at the works. The Newport brigade provided an engine and emergency tender for the exercise.

B.S.S. for Glass Fibre Reinforcing Fabrics

The British Standards Institution has now issued Part 3 of B.S. 3396 'Woven glass fibre fabrics for plastics reinforcement.' This covers fabrics specified in Parts 1 and 2 which have undergone a finishing treatment to make them suitable for use with polyester resins. Various types of treatment are provided for, and requirements in relation to the final properties of the material are laid down.

Sto-Chem Handle Own Latex Sales

WITH their £1 million plant in the Midlands, for the production of 8 million lb./year of Naugatex and Nitrex synthetic latices, nearly completed, Sto-Chem Ltd. have formed their own sales division, which became operational on 1 October. Witco Chemical Ltd., who by arrangement with Sto-Chem sponsored the initial sales development, will be relinquishing their distributorship in view of the Sto-Chem plant coming on stream at the end of this year. It was originally envisaged that Sto-Chem would undertake sales of their products.

The sales control offices will be located alongside Sto-Chem's technical service laboratories and producing facilities at Stoke Works, near Bromsgrove, Worcs.

Lower Prices for I.C.I. Perspex

In anticipation of lower costs arising from increased standardisation and productivity, the price of Perspex acrylic sheet has been cut by I.C.I. Plastics Division from 16 October by an average of chases of standard-sized sheets and bulk 2%. Incentives are to be given for purchasers. Further significant cost reductions are expected over the next two or three years.

For details of Perspex capacity expansion plans see 'Project News', p. 623.

Scientific Manpower

(Continued from p. 621)

One critic of the scientific manpower report calculates that it will take at least ten years to make up the present deficiencies in the equipment and buildings of a large sector of our universities and colleges, to make them fully effective in training scientists and technologists.

Everything points to the need for closer liaison between industry, the universities and colleges and the Government, and it may well be that some sort of central science board may prove to be the answer. It would be necessary for such a board to be in close touch with all sides. Besides considering industry's manpower requirements for research—and the chemical industry is in the forefront of those to whom the U.K.'s entry into the Common Market would mean a great intensification of research effort—it could look to the future and advise the universities accordingly. It might also, in liaison with the D.S.I.R., ensure a better integration of pure and applied research, for which there has long been a crying need in the U.K. One thing it must not do, however, is to assume powers which might lead to restrictions on individual scientists themselves.

Project News

Howard's New Sorbitol Plant Gives U.K. Surplus Capacity

WITH their new Sorbitol plant now in production, **Howards of Ilford Ltd.** are in a position to meet any foreseeable demand for the syrup or the powder over the next few years. The new plant has an annual capacity of 4,000 tons of 70% syrup—well above the present market for Sorbitol in the U.K. Howards, a member of the Laporte Industries Group, are the only U.K. producers of Sorbitol. They have manufactured it for the past 21 years by the reduction or hydrogenation of glucose. Contractors for the new plant were L. A. Mitchell Ltd.

The syrup, which will be sold as Howsorb I, finds many applications in industry as an inexpensive humectant. Because it is completely free of any toxic hazard it is particularly suitable for use in the food, confectionery, pharmaceutical and toiletries industries.

Pure Sorbitol is available as a crystalline powder, but for most cosmetic and industrial purposes the syrup is more convenient and economical. The product is used in mixtures with glycol as an anti-freeze, in the manufacture of printing ink rollers, and as a softening agent in textile, paper and leather manufacture. In fine and pharmaceutical chemicals it is the raw material (*via* Sorbose) for ascorbic acid and is also used in the manufacture of compressed tablets. In foodstuffs it replaces sugar as a sweetener in diabetic nutrition and serves to increase the shelf life of confectionery, etc. Its properties have been found to be particularly beneficial in the cosmetic and toiletries industry in the formulation of specialities such as toothpastes and skin creams.

The esters and derivatives of Sorbitol are useful emulsifying agents.

Steeley Participate in Sardinian Magnesia Venture

● TAKING part in a new joint venture to produce magnesia from sea water at S. Antioco, near Cagliari, Sardinia, will be the **Steeley Co. Ltd.**, who operate the world's largest plant of this type at Hartlepool. Their partners in the venture will be Italian and German companies.

Procon's Contract to Build Mombasa Refinery

● AS revealed in 'Project News' last week, **Procon (Great Britain) Ltd.**, London, have been awarded a contract to build a refinery at Mombasa, Kenya, with a crude oil intake capacity of 1.95 million tons/year. Operators are East African Oil Refineries, a joint Shell/B.P. company.

Construction work will start in December and on-stream date is scheduled for

the end of 1963. The new refinery will produce petroleum, kerosene, aviation fuel, gas oil, diesel oil and fuel oil. Capacity will be sufficient to supply East African needs for some time to come.

French Factory for Aspro-Nicholas

● CONSTRUCTION is to begin next March on a factory for **Aspro-Nicholas** at Gaillard in France. Production will start some time in 1963.

W. J. Fraser Offer Hydrogen Fluoride Recovery Plants

● THE U.K.A.E.A. process for hydrogen fluoride recovery from aqueous solutions excited much interest when demonstrated at the Achema Exhibition. Plants operating on this process are available from **W. J. Fraser and Co. Limited** under their collaboration agreement with the Authority.

The process has applications in both nuclear and non-nuclear fields and research is continuing to extend the range of its specific uses in industry.

Lightnin Mixers for Strasbourg Plant

● ORDER valued at £75,000 for the supply of fluid mixers to the **Polymer Corporation** of Sarnia, Ontario, has been received by **Lightnin Mixers Ltd.**, Poynton, Ches. The units to be supplied

will provide the main mixing requirement for the new synthetic rubber plant which the Corporation is setting up at Strasbourg, France (C.A., 5 November, 1960, p. 757) and are expected to be delivered during the early part of 1962.

Mr. W. Stockdale, chairman of Lightnin, who paid a flying visit to France to settle final details of the order, reports that the British units were chosen despite very strong Continental competition.

Gas Cleaning Contract for Peabody

● CONTRACT for the gas cleaning and recovery equipment for the Kaldo steelmaking plant at Stora Kopparbergs Domnarfvet Works, Sweden, where hot metal is refined by oxygen in a rotary furnace, has been awarded to **Peabody Ltd.**, 300 Vauxhall Bridge Road, London S.W.1. The contract for complete design, manufacture and erection, includes the supply of a Peabody wet gas scrubber, a thickener and centrifuges and is to be installed for the original 30-ton Kaldo furnace.

Most of the equipment will be manufactured in Sweden under the supervision of the local Peabody office. Completion is due in July, 1962.

I.C.I. Perspex Capacity to Rise to 20,000 T.P.A.

● AN increase in the Perspex acrylic sheet capacity of **I.C.I. Plastics Division**, recently completed, will be followed by further extensions next year which will result in a total capacity in excess of 20,000 tons. As stated in our survey of chemical plant projects (C.A., 30 September, p. 503), this is a 3,000 tons/year extension at Wilton. Cost is £1 million and construction is being handled by I.C.I. engineers.

Site of Laporte's Australian TiO₂ Plant



Aerial view of Bunbury, 115 miles south of Perth, where the £A4 m. titanium oxide plant of the recently formed company **Laporte Titanium (Australia) Pty. Ltd.** is to be built. Raw materials are on the spot and preliminary work has already commenced. Overall engineering and construction contractors are the **Bechtel Organisation** (C.A., 7 October, p. 548)



★ INVESTMENT of \$14 million in Canada by a British company at a time when most of that country's foreign investment stems from the U.S. and when the Canadian chemical industry is clamouring for greater protection from imports, is an act of courage. Capital for Electric Reduction of Canada's new phosphatic fertiliser project at Port Maitland, Ont., has been supplied partly by the parent Albright and Wilson Group and partly by private borrowing in Canada.

Dr. D. E. Jones, president of ERCO, and a chemistry graduate of the University of Wales, told me last week that he was not greatly worried by Canadian chemical tariffs. These were originally fixed many years ago and are now the subject of a protracted public review. Dr. Jones said that no country could build up a chemical industry without protection, if only for an initial period. The Government now has to decide if it wants a thriving economy and a thriving chemical industry. Dr. Jones is in no doubt as to what the answer will be.

The Port Maitland project is Albright and Wilson's first venture into fertilisers and I was not surprised to learn from Mr. John Christopherson, an A. and W. director, that the group is unlikely to make fertilisers in the U.K.

★ THE layman who thinks of a 'skid-mounted process unit' as a sort of industrialised toboggan speeding down a snow-covered mountain slope will not be so far off the mark at that, for the demand for such units has certainly snowballed in recent years. The popularity of packaged, transportable process units shows up best in locations where unfavourable climate, labour shortages or other local conditions are against *in situ* construction. An example is the 4,000 bbl./day refinery recently completed in the Puerto Barrios region of Guatemala by the Lummus Co., New York, all the units having been transported there on 'skids'. Since 1952, Lummus have designed, engineered and fabricated nine different units based on the transportable concept for the petroleum, chemical, nuclear and food processing industries. A brochure recently issued by the company's office at 385 Madison Avenue, New York 17, N.Y., illustrates some examples.

Also in the packaged plant business are the Girdler Corporation of Louisville, Ky., U.S., who are now offering skid-mounted hydrogen sulphide plants with production capacities of 1.5 tons/day. These units can supply H_2S in larger-than-cylinder quantities for the precipitation of nickel, cobalt and other metals. Features: a simple reactor combining

hydrogen with molten sulphur at 800-900°F, and about 100 p.s.i.g.; washing of H_2S and entrained vapours in a packed absorption tower; two water coolers operating in parallel.

★ THE meeting held in Paris last week to consider the setting up of a European chemical market research organisation was a notable occasion. For most of the continental market research representatives present, it was their first contact with their 'opposite numbers'.

No decision was taken to form a European Chemical Market Research Association, but as stated in this journal last week (p. 592) a further exploratory meeting will be held in London next January. There was wide agreement at the Paris get-together that any organisation set up should be informal and not on the lines of the American C.M.R.A., which organises regular meetings at which papers are presented. A European 'association' is more likely to have as its main aim the easing of informal contacts between market research people.

I was interested to learn from Mr. E. Tarnell, director, of Roger Williams Economic and Technical Services, organisers of the meeting, that since his last visit to Europe a few years ago, he found that chemical market research had assumed a much greater importance in the eyes of chemical industry managers.

★ A MEANS of improving water transport in a hydrogen-oxygen fuel cell has been developed by the Armour Research Foundation, Chicago. It consists of an inorganic membrane about 1 in. diameter and 0.03 in. thick, the inner part of which is a polymer of $ZrO(H_2PO_4)_2$ compressed with Teflon. The inner layer of the membrane is enclosed on each side with first a layer of polymer mixed with platinum black and then a layer of platinum black alone, and finally a platinum screen on the outside.

The membrane operates at near the boiling point of water and can be alternately wetted and dried without deterioration. Open circuit potential is 0.96 volts and a cell carries 3 amps. per sq. ft. at 0.6 volts. In view of the large number of hydrogen transport sites—4 per monomeric unit—together with the efficient water transport, A.R.F. predict that current densities up to 100 amps. per sq. ft. above 200°F can be obtained.

★ EVER ordered a 'trouser piece'? Been plagued by a 'devil liquor'? Are you under the impression that 'official calorific value of town gas' is a cunning subterfuge aimed at deluding gas

consumers? Anyone who is mystified about such terms should consult the revised 80-page edition of B.S. 1179, 'Glossary of terms used in the gas industry', which defines 900 terms and should be a valuable aid to gas engineers and others in industry who want to keep up to date in their terminology and who appreciate the need for everyone in industry to speak the same technical language.

Prepared by a technical committee made up of representatives of the Gas Council, the Institution of Gas Engineers, the Society of British Gas Industries and the Ministry of Education, the new glossary replaces the wartime one issued in 1944. Many new terms and modified definitions which have grown up over the past 16 years are incorporated.

★ To head their new basic research group, the Gas Council were looking for someone with first-class ability in original research. They now appear to have found such a man in Dr. J. A. Gray, 42-year-old group leader in physical chemistry and chemical engineering at the Battelle Memorial Institute, Geneva, since 1958. Dr. Gray, who takes up his appointment on 1 February 1962, will exercise full control over the basic research group's scientific work, for although for administration purposes it will form part of the Council's London Research Station, the group will operate independently.

Educated at Watford Grammar School and at King's College, University of London, Dr. Gray was with I.C.I. Alkali Division before joining Battelle. In his new appointment, he certainly faces no mean task for, as reported in C.A., 4 February, p. 214, the new research group will be expected to develop completely new ideas for the production and utilisation of gas.

★ CATEGORICAL statements in print are a hazard to the journalist and can mislead readers if they are unfounded. None-the-less, this journal believes in putting the facts—and its views—forcibly when appropriate. Last week, however, a statement to the effect that there were only two p.v.c. producers in the U.K. has led one or two readers to point out that this is just not true.

British Geon and I.C.I. are the only vinyl chloride monomer producers in this country, but Bakelite Ltd. also produce the polymer, buying monomer for the purpose from I.C.I. When the article concerned was checked against our records, a note, dated 1960, suggested that this polymerisation unit was no longer in use.

I am glad to correct the record and to be able to say that the Bakelite plant at Aycliffe, Co. Durham, with capacity for some 6,000 to 7,000 tons of polymer a year, is currently producing at a rate of 5,000 tons/year.

Alembic

A.B.C.M. Annual Meeting

PLANNING PROBLEMS BEST SOLVED BY CO-OPERATION NOT PHYSICAL CONTROLS

GIVEN the right spirit in industry, the Chancellor of the Exchequer's planning problems could be solved by voluntary co-operation without the need of any national system of physical controls or other restrictions. This was obvious from the chemical industry's achievements in the field of productivity and in establishing good labour relations which had resulted in a rate of growth for chemicals and an increase of productivity almost double that of British manufacturing industry as a whole.

This was stated by Sir William Garrett (Monsanto Chemicals Ltd.), chairman, at the annual meeting of the Association of British Chemical Manufacturers, held in London on 12 October.

Following an approach to some companies, the Board of Trade had already



J. C. Hanbury,
new chairman of
A.B.C.M.

completed a report on the long-term planning of the future of the chemical industry. Sir William stated he knew that the Chancellor's proposals for long-term planning to bring Britain's rate of economic growth more in line with that of other countries would be faced by chemical manufacturers with confidence.

He felt that the chemical industry was on more certain ground in dealing with planning than with the Common Market. These he described as the two major problems "posed for us by the Government during the past few weeks".

Referring to the European Economic Community, Sir William said it was pleasing to see that the Government had at last taken the definite step of applying to the Six to negotiate U.K. entry into the Common Market. If achieved, entry would give rise to problems for each individual member firm as well as for the association. He added "Our experience in assimilating the requirements of the Stockholm Treaty into our general pattern of trade and industry will help us in dealing with similar tasks in connection with the Treaty of Rome".

At the annual meeting, Sir William was succeeded as A.B.C.M. chairman by Mr. J. C. Hanbury, chairman and technical director of Allen and Hanburys Ltd., a member of the Glaxo Group. Mr. Han-

bury is a past-president of the Association of British Pharmaceutical Industry. New A.B.C.M. vice-chairman is Mr. M. J. C. Hutton-Wilson, chairman of Associated Chemical Companies Ltd.

Other A.B.C.M. council members for 1961-62 are:

President: Bernard Hickson (Hickson and Welch Ltd.), chairman from 1957 to 1959.

Vice-presidents: Dr. F. H. Carr, C.B.E.; Dr. E. V. Evans, O.B.E.; Sir Graham Hayman (The Distillers Company Ltd.); Sir Harry Jephcott (Glaxo Laboratories Ltd.); C. F. Merriam, M.C.; and G. F. Williams (British Drug Houses Ltd.).

Hon. Treasurer: J. L. Harvey, M.B.E. (Fullers' Earth Union Ltd.).

Elected Members: G. H. Beeby (British Titan Products Co. Ltd.); E. L. Bush (W. J. Bush and Co. Ltd.); G. H. W. Cullinan (Shell Chemical Co. Ltd.); W. A. M. Edwards (Imperial Chemical Industries Ltd.); W. K. McGavin (Shell Chemical); P. D. O'Brien (Laporte Industries Ltd.); F. S. Poole (Peter Spence and Sons Ltd.); H. G. Rolfe (British Drug Houses Ltd.); W. D. Scott (I.C.I.); E. Stein (Distillers); J. E. Taylor (Unilever

Ltd.); J. H. Townsend (I.C.I.); B. White (A. Boake, Roberts and Co. Ltd.).

Co-opted Members: G. H. Carnall (Clayton Aniline Co. Ltd.); J. C. Christopherson (Albright and Wilson Ltd.); C. E. Evans, O.B.E. (British Hydrocarbon Chemicals Ltd.); N. F. Patterson, O.B.E. (Monsanto Chemicals Ltd.).

Regional Chairmen:
London and South-East Region, P. D. O'Brien (Laporte Industries).

Midlands Region, A. R. Foxall (John and E. Sturge Ltd.).

North-east Region, L. L. Bedford (Yorkshire Dyeware and Chemical Co. Ltd.).

North-west Region, Dr. J. E. Taylor (Unilever).

Scottish Region, C. J. Waller (Scottish Tar Distillers Ltd.).

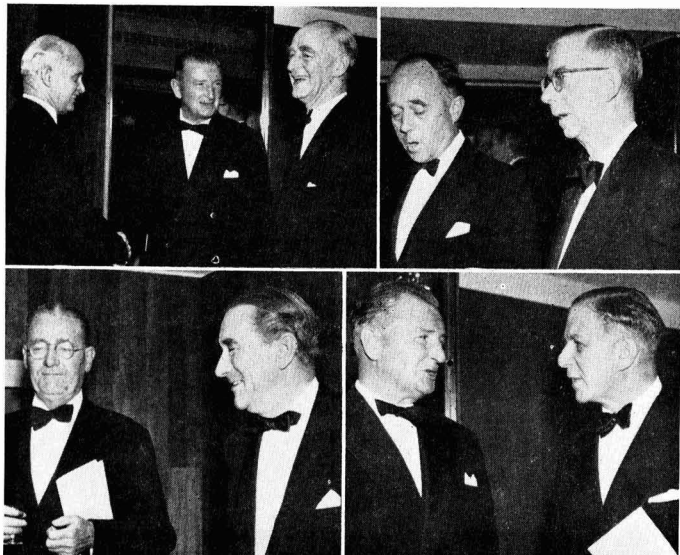
South-west Region, J. A. A. Blaikie (Albright and Wilson (Mfg.) Ltd.).

Hon. Vice-presidents: C. E. Carey (South Eastern Gas Board); L. P. O'Brien; K. H. Wilson, O.B.E.; Sir Walter Worboys.

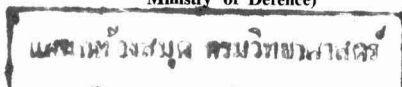
Director: G. Brearley.

Deputy Director: H. W. Vallender.

General Secretary: A. J. Holden.



At the A.B.C.M. annual dinner, left to right (top): Bernard Hickson (Hickson and Welch), A.B.C.M., president; Sir William Garrett (Monsanto Chemicals Ltd.), A.B.C.M. chairman; George Brearley, A.B.C.M. director; John Christopherson (director, Albright and Wilson); and R. A. Jones (B.o.T. Industries and Manufactures Department). Below: Sir Howard Florey, president, Royal Society; Sir H. Roxbee Cox (chairman, D.S.I.R. Council for Scientific Research); Sir William Garrett and Sir Solly Zuckerman (scientific adviser, Ministry of Defence)



Need to Encourage U.K. Oil-Based Aromatics Source, says A.B.C.M.

BOTH the Association of British Chemical Manufacturers and the National Benzole Association have stressed the need for an early declaration of the Government's intentions regarding future legislation on light hydrocarbon oils so that adequate time might be available for the industry to plan its future supply.

This is stated in the A.B.C.M. annual report for the year ended 30 June, 1961. Both associations agreed that the demand for benzene would outstrip the coal-based sources of production and that the balance would have to come from petroleum-based manufacture in the U.K. or from imports.

After long discussions, the two associations presented a joint document to the Board of Trade and the Ministry of Power in which the producers asked for Government financial support to continue in some form after the present arrangements cease. On behalf of users, A.B.C.M. urged that any such assistance should only be given in a manner that would not discourage the petroleum-based producer from undertaking the manufacture of the quantities required to meet any shortfall from coal-based sources. The new legislation should be designed to ensure adequate supplies at world prices.

Chemical Plant Deliveries. The position regarding the supply of items of chemical equipment has deteriorated, glass-lined steel equipment being a particularly black spot. Increasing dependence on imports in these cases having been forced on the user, the councils of A.B.C.M. and the British Chemical Manufacturers' Association are now considering possible joint action to alleviate the situation.

A slight improvement early in 1960 in plant deliveries was followed by a further marked deterioration in the position. Little or no progress resulted from a meeting with the stainless steel makers early this year. As a result of various stockists having now acquired some stocks, the position of the smaller user had shown some improvement. At a further meeting with producers, at which the growing dependence on imported equipment was stressed, a promise of closer and regular consultation was given.

European Economic Community. Tariffs on internal trade between the Six were cut a further 10%, making 30% in all. Some of the later reduction was extended to the U.K., provided the new levels did not fall below the proposed common external tariff. Now under consideration was the possibility to cut internal duties on industrial goods by 50% of the original level by the end of 1962. This further acceleration might depend on steps to deal with agriculture. Elimination of import and quota restrictions had also been speeded up and these would disappear at the end of 1961, eight years ahead of the date originally agreed.

E.F.T.A A second cut in tariffs took place on 1 July, 1961, six months earlier than intended and the question of a further speed-up of duty cuts was now being considered.

The origin rules had so far proved practicable in operation and only a few changes had been necessary. These were

Highlights of A.B.C.M. Report

- **Delays in chemical plant deliveries have increased, particularly for glass-lined steel equipment**
- **Benzene demand will call for petroleum-based sources in the U.K. or for imports**
- **Government proposals for pipeline development do not appear to meet A.B.C.M. wishes**
- **'Voluntary' ban on arsenites, imposed because of the emotional impact of the name, created a serious precedent**

confined to certain plastics articles. Certain process rules that were due to expire at the end of 1961 had been extended after consultation with the producers concerned.

In exercising its option under Article 6 dealing with revenue duties, both A.B.C.M. and the National Benzole Association felt that the protective elements in those duties should be untouched until 1964; this view was accepted by the Board of Trade.

Tariffs. With a view to improving and streamlining the temporary exemptions procedure, a proposition was made to the Board of Trade that a duty-free direction system should be adopted for imports of chemicals of not more than £100 value once or twice a year. An amended scheme, put forward by the B.o.T., is currently being discussed. Aim of these proposals is to reduce the large number of applications, mainly for laboratory reagent chemicals.

Training Scheme. An intermediate grade in the training scheme for qualified chemical operators was now to be recognised with the aim of maintaining the interest of men who had completed the five-year course, but failed to pass the final examination.

Restrictions on Usage. Dealing with the concern felt regarding increasing Press attacks on the use of chemicals in food-stuffs and agriculture, the report refers to the 'voluntary' ban on the use of sodium and potassium arsenites as a serious precedent. This was imposed largely because of the emotional impact of the name on the public, whipped up by a Press campaign.

There was the serious risk that, from

political considerations, other products might be affected and an increase in unnecessary or unreasonable Government restrictions might seriously hamper the introduction of new products. The extent to which the matters complained of were already covered by legislation was either little realised or deliberately ignored.

As a result of these attacks and in view of the increased tendency of the Government to restrict the use of chemicals, a special committee had surveyed the background facts and general principles. The committee felt that it was usually better to ignore attacks in the sensational Press, although it might sometimes be necessary to correct flagrantly untrue statements. Serious and constructive criticisms should be answered factually by the companies or specialist associations concerned, arranging for replies to be made by experts.

Productivity. A study of Continental practice in the training of chemical plant operators showed that the steps taken by the British industry were generally much more advanced than in Europe.

Application had been made for the industry to take part in the European Productivity Agency's scheme for visits of joint management/trade union productivity teams to Europe. Applications have also been made for permission to send teams from the U.K. chemical industry to West Germany and Italy; these visits are scheduled to take place this month.

Pipelines. Following a request for views on the use of pipelines, an A.B.C.M. committee, chaired by G. H. W. Cullinan (Shell Chemical), informed the Board of Trade that geographical conditions made it unlikely that any pipeline network would be extensive; that it would probably be limited to certain areas; that the chemical industry was relatively satisfied with present arrangements for pipeline construction and would only support new legislation if it proved a cheaper, quicker and less complicated procedure than the Private Bill method.

The B.o.T. was also told that it should be accepted that pipeline development was in the national interest and that the technical problems involved were so selective that common carrier or multi-purpose pipelines were not practicable for chemicals.

Government proposals for new legislation to secure the orderly development of privately-owned pipelines were still under consideration but did not appear to meet A.B.C.M. wishes. A suitable alternative Parliamentary procedure for submission to the B.o.T. has been worked out.

Packaging. The attention of the British Standards Institution has been called to the difficulties caused by the absence of any standard dimensions for the internal diameter of fibreboard drums.

Patents and Trade Marks. The patents committee supports in principle the idea of a European patent but feels that the chemical industry should not give its views in isolation, but that the views of industry as a whole should be co-ordinated.

Dyestuffs. Repeal of the dyestuffs import regulations had led to a lack of

adequate data on imports, which were necessary for the proper operation of the E.F.T.A. rules of origin. As a result of representations, the monthly statistics for dyestuffs are now available to industry under the 14 O.E.E.C. categories.

The food colours sub-committee is currently working on a further six approved food colours.

Outcome is awaited of representations made to the U.S. Bureau of Customs on the difficulties of operating the proposed new rules relating to the entry of coal tar intermediates into the U.S.

Chemical Engineering Research. Work on five of the sponsored distillation research projects has gone well and the sixth project got under way during the year at Swansea University when the full scale plant became available after unforeseen delay.

The liquid/solid separation panel has arranged for three university professors to provide interim reports on three specific areas of the field. It is hoped that this will expedite the defining of any gaps in basic knowledge and proposals for the research projects necessary to fill them. The more recently formed drying panel is dealing with the task of defining relevant gaps in chemical engineering knowledge.

At the request of the Institution of Chemical Engineers, the association carried out a survey to check the deduction from official statistics that the chemical industry's demand for chemical engineers was falling below previously estimated needs. Replies confirmed that there was still an unsatisfied demand, particularly for chemical engineers of higher quality. Most firms replying felt that chemical engineers should have broad technological training.

Trade Effluents. A.B.C.M. did not object to the principles in either the Bill introduced to implement the recommendations of the Armer Committee or the Rivers (Prevention of Pollution) Bill, which replaced rigid bye-law procedure by extending the River Board consent system to discharges that were being made to non-tidal rivers before the 1951 Act came into force. Representations made were directed towards ensuring that the measures were realistic and practicable.

Council agreed with the trade effluents committee that, subject to reservations, particularly on the preservation of rights of existing surface and underground water abstractions, the association should support in principle the legislative measures for water conservation to minimise the effect of droughts and floods and to develop water resources to meet growing demands. The provision of adequate future water supplies was of considerable importance as the chemical industry was believed to be the second largest industrial user of water.

Members concerned did not oppose proposals to extend the Alkali & Works regulations to cover beryllium, selenium, certain uranium works and caustic soda works and to the list of noxious or offensive gases to include carbon monoxide and fumes containing beryllium, selenium, uranium, sodium,



L. to r.: H. W. Palmer (president, Association of British Pharmaceutical Industry); A. K. Ames (chairman, British Colour Makers' Association); Dr. J. S. Carter (Chief Alkali Inspector, Ministry of Housing) and Dr. H. K. Black (Chief Inspector of Explosives, Home Office)

potassium, or their compounds. A public enquiry is to be held.

Safety. Administrative arrangements needed to implement plans for further safety training facilities at management and supervisory levels are being examined.

Last time and accident statistics for 1960 did not follow previous trends of progressive improvement and the reasons are being studied. The great majority of chemical industry accidents are not due to the nature of production operations, but are of the type common to all industries. Manhandling provides by far the greatest proportion.

Transport. The Home Office working party set up to prepare a uniform system of marking road tankers used for

dangerous substances was making slow progress. A provision scheme, however, has been produced and is being studied in detail.

Weights and Measures. Following critical reception from industry, A.B.C.M. supported the Federation of British Industry in making representations on the Weights and Measures Bill, particularly regarding transactions between manufacturers on an industrial scale in which the public were not involved. Considerable resistance was met, but assurances were eventually given that the difficulties would be re-examined, including certain physical problems connected with bulk deliveries. The Bill is now being redrafted.

Chemical Industry's Need for Scientists

OUTPUT of the chemical industry would continue to increase as the concentration of professionally trained manpower increased. Today, qualified men employed in the industry totalled 15,000, or 3.7% of the total payroll, compared with 2.7% in 1955; the total was likely to rise to 40,000, or 8% of the payroll, by 1970.

This was stated by Sir Solly Zuckerman at the annual dinner of the Association of British Chemical Manufacturers, held in the Grosvenor House, London, on 11 October. Scientific adviser to the Ministry of Defence and vice-chairman of the Advisory Council on Scientific Policy, Sir Solly was replying to the toast of 'The guests', proposed by Sir William Garrett, chairman.

The chemical industry with its record of expansion made increasing demands on scientific manpower, said Sir Solly. Before the war, the total output of all professional chemists was little more than 700, with only 10 graduates in chemical engineering. By 1948, the figures were 1,200 and 30 respectively. Today, they were well over 1,500 and 200. Sir Solly would not be surprised if more chemists and chemical engineers were being turned out today than the prewar total for all science graduates.

The first useful estimate of scientific manpower was made in 1955, showing a total of 140,000, some 40% of whom were working in industry. The chemical industry accounted for about one-sixth

of the total employed in industry. That meant that some 2.7% of the industry's employment force had been professionally trained.

The 1959 grand total of science graduates was 173,000; the biggest part of that increase of 20% over three years was employed in industry. In the space of three years the chemical industry was employing one-and-a-half times as many professional scientists, who now represented 3.7% of the total payroll. If the proportion continued to rise at the same rate, the industry's employment of qualified manpower would increase from 15,000 today to 40,000 or more by 1970. By that time, 8% of the industry's payroll would be chemists and chemical engineers.

Per head of population, Britain was turning out more chemists than the U.S. Our main shortage was in capital resources and in chemical engineers. As long as chemists were produced at the present rate, the industry was not likely to be starved of brains.

Among the guests were Sir Harold Roxbee Cox, chairman, Council for Scientific Research, D.S.I.R.; Lord Fleck, president, Society of Chemical Industry; Sir Howard Florey, president, Royal Society; Sir Richard Powell, Permanent Secretary, Board of Trade; Sir William Slater, president, Royal Institute of Chemistry; and Professor Sir Alexander Todd (president, Chemical Society, and Master of the Salters' Company).

HIGH PRICES LOSE BRITISH CHEMICAL MARKETS IN JORDAN

BRITISH chemical producers are losing export markets in Jordan because they are frequently unable to quote prices in line with European competitors. Quality of U.K. chemical products is still considered to be high-class and it should be possible for them to gain a much larger share of the market.

These conclusions are reached in a report by the commercial secretariat at the British Embassy, Amman and published by the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London W.C.1, under reference ESB 254/G(10).

Jordan's main chemical imports with supplying countries are:

Sodium hydroxide—U.K. has largest slice of the market and is successfully holding off severe competition from West German exporters, whose prices are £24 10s/ton c.i.f. Aqaba in 300-400 kg. metal drums.

Citric acid—Netherlands and Belgium are main suppliers for reasons of price, Dutch exporters quoting £170/ton c.i.f. Aqaba.

Tartaric acid—mainly supplied by Spain.

Sodium carbonate—U.K. is main supplier. Bulgaria is quoting £14 10s/ton c.i.f. Aqaba in 50-100 kg. bags.

Sodium hydrogen carbonate—main suppliers are U.K., Italy and West Germany. Bulgaria is currently quoting

£19/ton c.i.f. Aqaba in 50 kg. bags.

Ammonium sulphate—Austria and West Germany are main suppliers, with both countries quoting £15/ton c.i.f. Aqaba in 100 kg. bags. Material is available from Italy at £14 6s/ton c.i.f. Aqaba.

Compound fertilisers (14:14:14)—Prices quoted are: West Germany, £31/ton c.i.f. Aqaba; Holland, £30/ton (both prices are c.i.f. Aqaba in 100 kg bags).

Ammonium chloride—U.K. is main supplier.

Alum crystals—main source is France.

Ammonium hydrogen carbonate—U.K. is main supplier, with West German prices quoted at £78/ton c.i.f. in 5 kg. tins.

Sulphur powder (95-99.5% purity and 325 mesh) West Germany has been main supplier as U.K. prices are said to be very high. Sulphur can now only be imported from the U.S. West German prices have been £21/ton c.i.f. in 6-ply paper bags of 50 kg.

Dyestuffs—most popular lines are direct colours for cottons, acid colours for wool, indigo as a fast colour for cotton grey sheeting; and water-soluble dyes from Belgium.

Earth colours—current demand is for black, green, red and yellow. Due to price factor, West German and Belgian colours are more popular than better quality colours from the U.K.

Slight Fall in Prices Index for Chemicals

SEPTEMBER wholesale price index of the Board of Trade shows that total sales of the chemicals and allied industries fell slightly in comparison both with the previous month and with the same month of a year ago. The following is an extract from the index which is based on a 1954 average of 100.

	Sept. 1961	Aug. 1961	Sept. 1960
Chemicals & allied industries:			
Total sales	103.0*	103.1*	103.3
Home market sales ...	105.1*	105.2*	105.4
General chemicals ...	103.7*	103.7*	104.8
Pharmaceutical chemicals	80.7*	80.7	81.4
Pharmaceutical preparations	102.2*	101.5	100.6
Paint	111.0*	110.6*	108.2
Soap	128*	129.1	129.0
Soapless detergents	97.8*	97.8	103.5
Syn. resins & plastics materials	84.1	84.3*	88.3
Commodities Wholly or Partly Imported			
Pyrites, c.i.f. U.K. ports	64.9	94.9	60.4
Sulphur, crude (for acid making) c.i.f.	72.1	72.1	75.4
	* Provisional		

Precipitated CaCO₃ Fillers for Polythene

WHEN precipitated calcium carbonate is used as a filler in the processing of polythene, the finished product has increased stiffness and added whiteness and the cost of the polythene is reduced, according to conclusions drawn from work carried out recently by John and E. Sturge Ltd., Wheeleys Road, Birmingham 15.

Information on the use of precipitated calcium carbonate in this field is contained in a provisional data sheet issued by the company. The data sheet includes a table showing the ultimate tensile strength, extension at break and brightness for unfilled polythene and for polythene loaded to 50 parts per hundred of resin with different types of p.c.c.

It is claimed that Sturge p.c.c. is suitable for use with polythene in compounds to be extruded, vacuum-formed, compression or injection moulding.

I.C.I. Employees Get £2.6 M. of Stock

SOME 63,000 employees of I.C.I. last week received certificates for £2,615,000 ordinary stock of the company this week—more than twice the £1,247,405 of stock handed over to 22,998 employees last year—under the company's profit sharing scheme. More than half of the stock issued to employees last year was retained by them.

Rise in Chemical Industry Capital Spending

CAPITAL spending in the U.K. chemicals and allied industries in the second quarter of this year totalled £50.3 million, compared with £44.7 million in the first quarter and with other second quarter figures of £37.8 million in 1960, £43.5 million in 1959 and £48.4 million in 1958.

Capital spending in the first half of this year totalled £95.0 million, compared with £75.7 million last year, £93.7 million in 1959 and £97.1 million in 1958.

I.C.I. Acrylonitrile Plant Shuts Down for New Process Modification

THE acrylonitrile plant of I.C.I. General Chemicals Division at Castner Kellner Works, has, it is understood, been shut down with a view to modification. The £3 million plant, opened early in 1960, has used the hydrogen cyanide route, which has proved uneconomic in view of recent sudden and drastic U.S. price cuts, made largely because of over-capacity. This has been the only U.K. facility for acrylonitrile production.

The I.C.I. process has worked well, producing material of high quality. But other processes have been developed in the last few years that are inherently cheaper and some of which have advantages of cheap raw materials. These processes largely use propylene, ammonia and air, the best known being the Sohio process. The Distillers Company also have an ammoxidation process, which has been licensed to Ugilor of France, where plant with 4,000 tons/year capacity has been completed. Other processes are held by E. I. du Pont de Nemours and Montecatini (see also p. 634).

The Castner Kellner plant will be modified to take advantage of these de-

velopments and will presumably be based on one of the petrochemical processes available. Such modification, however, would be substantial and it is unlikely that it could be completed within a year.

The 60 workers affected by the plant shut-down are not likely to be declared redundant and will probably be offered alternative employment in I.C.I. factories in the Billingham area. It is also understood that arrangements have been made to supply the company's acrylonitrile customers during the shut-down period.

U.K. demand for acrylonitrile is currently estimated at about 12,000 tons/year, of which some 2,000 tons have been imported. By 1963-64 big expansions in the production of acrylic fibres by Courtaulds and Chemstrand, coupled with the production of ABS polymers, will boost U.K. demand to an estimated 30,000 tons/year. Big reason for the U.S. price cuts that have out-priced I.C.I.'s production has been the build up of capacity which by 1962 will total around 450 million lb.; demand, however, is not expected to be much more than 300 million lb.

ERCO OPEN \$14 M. ONTARIO PLANT

Albright & Wilson Group's First Facilities for Fertiliser Production

FIRST fertiliser production facilities of the Albright and Wilson Group have been opened in Canada, where at Port Maitland, Ont., the Electric Reduction Co. of Canada Ltd. (ERCO) are now in production with their new \$14 million plant.

Using the Prayon 'wet' process, capacity for phosphoric acid is a minimum of 200 tons P_2O_5 a day, or 70,000 tons/year. Capacity for a range of end products, including normal and triple superphosphates, liquid phosphatics for use in fertilisers and dicalcium phosphates for animal feed, is 140,000 tons a year.

The Port Maitland site was chosen for three reasons: because it offered excellent transport facilities; economic disposal of large quantities of gypsum cake; and because it was in the centre of markets. ERCO own 525 acres with an option on 75 more. In addition, mineral rights are owned for 663 acres and a lease is held for another 85 acres. This provides adequate land for "a very extensive expansion" and also offers the possibility of exploiting known reserves of natural gas for use in the company's processes.

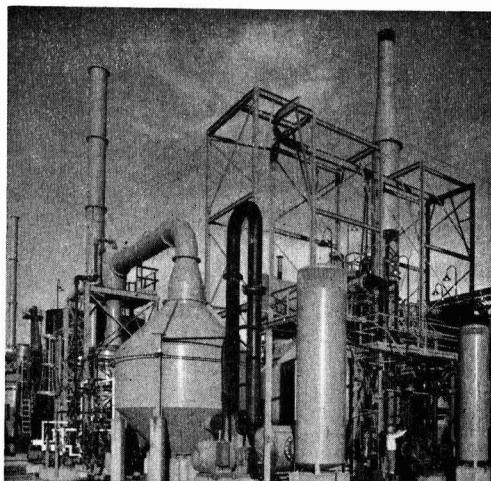
ERCO are one of a few phosphatic fertiliser producers in an area where consumption is currently rated at 750,000 tons/year. Most of this was previously imported from the U.S.

Construction of the new plant started in June 1960 and was completed slightly behind schedule 13 months later. It is sited where Grand River enters Lake Erie and there is ready access to excellent rail, road and deep water transportation facilities. Large sums have been spent on a gypsum disposal pond and on equipment to eliminate both atmospheric pollution and pollution of the Grand River, into which treated effluent from the gypsum pond flows. There is no economic use for the gypsum by-product at present, as supplies of cheaper gypsum rock are readily available elsewhere in Ontario.

Under an agreement with International Minerals and Chemicals of Chicago, who will supply up to 500,000 tons/year of Florida phosphate rock to ERCO, I.M.C. will market the Port Maitland fertilisers in the U.S. ERCO expect that at least 25,000 tons of P_2O_5 in the form of high-analysis phosphates will thus be sold in the north-central States.

A promising outlet for the new plant's output is the animal food trade since

General view of the phosphoric acid concentration plant, which uses the Ozark-Mahoning process



about 30,000 tons of phosphates are imported into Canada each year. Dicalcium phosphate, although competing with defluorinated phosphate rock and Curacao rock, provides the most available form of inorganic phosphorus for livestock food and should account for a major portion of the market. This growing market was responsible for the decision to increase the planned size of the DCP plant, which raised the overall cost from \$10 million to \$14 million.

Integrated nature of the Port Maitland operations enables ERCO to alter their product mix to suit market conditions. Its proximity to markets for industrial phosphates as well as the agricultural farmlands of Ontario and northern U.S. makes the location ideal for the company's future expansion programme.

Process. Phosphate rock, transported in rail cars from Florida, is ground and reacted with sulphuric acid piped from the adjacent plant of Sherbrooke Metallurgical Co., a subsidiary of Matthiesson and Hegler Zinc Co., U.S. It is then filtered and the precipitated gypsum discharged to waste. This is being carried out in a Prayon plant and produces weak wet phosphoric acid (about 30% P_2O_5 content).

The acid is then concentrated to 54% P_2O_5 content by an Ozark-Mahoning

submerged burner acid concentrator. At this stage, the acid is reacted with ground phosphate rock to produce triple superphosphate. Using an ERCO-developed clarification process, part of the concentrated acid is prepared for shipment in rail tank cars as phosphatic fertiliser solution, mainly to the northern U.S.

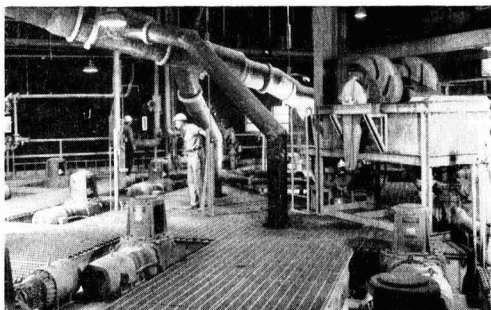
In the case of dicalcium phosphate, a defluorination technique is used before reacting the acid with ground limestone. The DCP process was also developed by ERCO research workers.

Other companies in the Albright and Wilson Group co-operated in the project, particularly in the field of wet acid and ultimate planning for industrial phosphates production. This involved numerous visits of Canadian personnel to the U.K. works of Marchon Products Ltd., Albright and Wilson (Mfg.) Ltd., and Albright and Wilson (Australia) Pty. Ltd.

ERCO were founded in 1897 to make phosphorus in Buckingham, Quebec, and joined the Albright and Wilson Group as long ago as 1902. The Canadian company's H.Q. are at Toronto and, in addition to the Buckingham works, there are other plant facilities at Varennes, Quebec, and at Vancouver, B.C. Until 1933, ERCO's main trade was to supply phosphorus to Albright's, who closed

(Continued on next page)

'Action floor' under which reaction of sulphuric acid and phosphate rock takes place at Port Maitland



CHEAP BY-PRODUCT HCl HELPS EXPAND FERTILISER INTERESTS

Superphosphate Conference at Wiesbaden

THE increasing availability of cheap by-product hydrochloric acid has made the fertiliser industry turn its attention towards finding ways of extending the applications of this product in the industry. The question of the value of hydrochloric acid to the fertiliser industry was dealt with in a paper by A. Strauchen, Fertiliser and Chemical Ltd., Israel, given to the technical meeting held recently at Wiesbaden by the International Superphosphate Manufacturers' Association.

At present hydrochloric acid has only limited application in the fertiliser industry. There are five main factors responsible for this: the chlorine ion has no fertiliser value and is rather undesirable in the soil as many plants are sensitive to it; chlorides form a highly hygroscopic calcium salt; dicalcium phosphate—the one well-known application of hydrochloric acid to the fertiliser industry—is water insoluble; hydrochloric acid is generally more corrosive than other acids; and the application of hydrochloric acid has been considered commercially impracticable.

Phosphate Rock Enrichment

One of the processes in which it is thought that hydrochloric acid may have a useful application is in the enrichment of calcareous rock phosphate. Many deposits of phosphate ore being of marine sedimentary origin contain considerable quantities of calcite. Such low grade phosphate ores are excellently suited for enrichment with hydrochloric acid. A process is described by the author which is not just a simple leaching. When leaching the calcium carbonate from a phosphate ore with hydrochloric acid even below a 3% concentration, the phosphate is also attacked and considerable quantities of P_2O_5 are lost to the waste calcium chloride-bearing liquor. In the process described the P_2O_5 is not only recovered but is also improved in quality due to the partial destruction of the apatite phosphate structure. In order to precipitate the dissolved phosphate another batch of calcareous phosphate rock is added and the calcium carbonate thus introduced acts as the precipitant. For complete reprecipitation final adjustment is made with milk of lime. The product contains 30 to 36% P_2O_5 . From the operational point of view the process is said to be even simpler than flotation and commercially is dependent on the price of the waste hydrochloric acid.

Although there is only a limited demand for fertiliser grade dicalcium phosphate direct fertilisation because of its water-insoluble nature, it may be considered as a valuable intermediate product for conversion to concentrated water

soluble phosphates. Water-soluble phosphates, although acting quickly on plants, are not utilized entirely, because a major part is lost by fixation in the soil. A more effective and prolonged effect could be achieved, according to many authors, with a fertiliser containing about two thirds of its P_2O_5 in water soluble form while the remaining one third or less would be available but released slowly. A fertiliser of this type may be readily obtained by reacting phosphoric acid with dicalcium phosphate. In this case a sav-

ing of nearly 50% phosphoric acid is effected as compared with common triple superphosphate. Fertiliser grade dicalcium phosphate suitable for this application may be prepared from soft phosphate rock and hydrochloric acid in a continuous process.

Various processes have been suggested for the conversion of phosphate rock into phosphoric acid by the use of hydrochloric acid. However, the difficulty is the recovery of phosphoric acid. A demonstration plant is being erected at Haifa and a plant as been licensed to a Japanese firm based on a process by which the phosphoric acid and calcium chloride are separated by distribution between two liquid phases. The free phosphoric acid is extracted from the aqueous reaction slurry into the solvent phase and is recovered by re-extraction by the addition of water. Suitable solvents for this process are aliphatic alcohols with three or more carbon atoms in the molecule.

ERCO'S Big Post-war Expansion in Canada's Sodium Chlorate Market

(Continued from p. 629)

their Oldbury furnaces after World War I. When new furnaces were started up at Widnes in 1933, ERCO began to use their own phosphorus and to concentrate on setting up an essentially Canadian business.

After the second world war, demands of the synthetic detergent industry for sodium phosphates, coupled with new and important outlets for sodium chlorate, meant expansion on a much larger and more rapid scale than had been necessary before. As a result the

claim to have captured the major share of the market for chlorine dioxide, made from sodium chlorate, for use as a whitening agent, particularly in packaging. The Vancouver plant, completed in 1957, serves the large British Columbia market.

The other major outlet is in uranium extraction. Needs of the uranium mining industry, to the north of Lake Huron, are met by the Buckingham plant's sodium chlorate output.

Dr. David Edward Jones, president of Electric Reduction, is a native of Wales, and he gained his B.Sc. and Ph.D. (chemistry) at the University of Wales. He joined Albright and Wilson in 1935 as a research chemist at Oldbury and was promoted assistant works manager, Widnes, in 1937. He became works manager the following year and in 1945 was made general manager of both the Kirkby and Widnes plants.

Dr. Jones moved to Canada in 1953 as president and managing director of ERCO, since when the number of employees has doubled to 700 and the sales have risen by 350%. He is vice-chairman of the Society of Chemical Industry of Canada. His son, Roger, graduated from Toronto University and is at present at King's College, Cambridge, under an Athlone Fellowship.



Dr. D. E. Jones,
president of ERCO

phosphorus plant at Varennes was opened in 1953 and now makes all the company's phosphorus.

The original intention was to concentrate production of phosphates and chlorates at Buckingham, but this was not sufficient to cope with rising demand for phosphates and the increasingly competitive nature of the market. Hence the decision to build the new large-scale facilities at Port Maitland.

Spectacular post-war growth of phosphorus and phosphate production has been rivalled by the expansion of the company's sodium chlorate facilities. Before the war, several thousand tons of chlorate were produced each year, mainly for use as a weedkiller. Two new uses—in paper and uranium—have greatly enlarged the market. ERCO

Urethane Foam Stocks Lost in Blaze

The fire at Woodside Mill, New Mills, Derbyshire—reported in CHEMICAL AGE, last week, p. 584, caused the loss of nearly £100,000-worth of urethane foam stocks and converting equipment. Kay Brothers Plastics Ltd. state that the plant will be almost back at full production by the end of next week. The 150 employees have been transferred to the main factory at Marple. The company is a member of the Reckitt and Colman Group.

Polymers of the 1960's

NEW POLYMERS FOR TEXTILES WILL BE DIFFICULT TO FIND

THE joint symposium organised by the Royal Institute of Chemistry, the Chemical Society, and the Society of Chemical Industry, on 'Polymers of the 1960's' and held at the University of Manchester, provided an attractive programme which well justified the excellent attendance.

Chairman at the first session, devoted to fibres, was Prof. R. N. Haszeldine, M.A., Ph.D., D.Sc. Speakers at this session were Dr. H. M. Standing (I.C.I. Harrogate), who discussed 'Fibres,' G. W. Meacock, D. Phil (British Nylon Spinners) who spoke on 'Nylon' and Mr. M. W. Alford, B.Sc., A.Inst.P., A.R.I.C., D.I.C. (British Celanese Ltd.), who discussed 'Tricel.'

Mouldings and films was the subject of the second session, also chaired by Prof. Haszeldine in the morning. Dr. R. Hayes (British Hydrocarbon Chemicals Ltd.) spoke on 'Polyolefins,' Dr. K. B. Everard (I.C.I. Welwyn Garden City) discussed 'P.v.c. and polyvinylidene chloride,' and J. F. E. Ruffell (Durham Raw Materials Ltd.) on 'Teflon.'

In the afternoon, Dr. L. R. Ridgway, M.Sc., Ph.D., F.I.R.I., presided for the continuation of the session on Mouldings and Films. 'Delrin' was the subject of the address by Dr. G. F. C. Barrett (Du Pont Limited, London).

The final session, on elastomers, had two lectures, with Dr. Ridgway presiding: 'Elastomers' by Dr. W. F. Watson (The Rubber and Plastics Research Association of Great Britain) and 'Silicone Rubbers' by J. Ames (I.C.I. Ltd., Nobel Division).

Recipe for Success

In his lecture on fibres, Dr. Standing said that the simple recipe for success of any fibre was that it should have at least one outstanding property, given, of course, that it could be produced economically.

In principle, it was much easier to predict the usefulness of a fibre for industrial than for apparel applications, since the important yarn properties were more easily measured and no considerations of high fashion applied. Clearly, the place of the synthetic fibres in industrial textiles was first due to their strength, and it was not without significance that they could be produced as continuous filaments in which their maximum strength could be directly realised, whereas that of natural fibres, excluding silk, of course, was reduced during conversion into yarn.

Obviously the usefulness of a fibre, in most cases, depended on a combination of properties—strength, abrasion resist-

ance, resistance to stretch, inertness to chemical attack and bacterial action—and it was their unique combination of properties which accounted for the success of the synthetic fibres in applications such as ropes and fishnet twines, filter fabrics and tarpaulins, industrial hose and belting. Compared with each other, they each had peculiar advantages—polyamides in resistance to abrasion and toughness, polyacrylics in light resistance and polyesters in resistance to stretch coupled with a high order of light resistance.

Dr. Standing said that while polypropylene would undoubtedly make its mark in the fibres field during this decade, structurally new polymers with outstanding textile properties would become increasingly difficult to find.

Polymer chemists might well find greater reward in modifying the properties of existing materials to suit specific uses. Polypropylene, itself, offered an example. In its present form, the fibre could not be dyed to a standard of fastness required for most textile uses, and, whereas special dyestuffs were developed for the once 'undyable' acetate rayon, the solution to the prob-

lem with polypropylene would probably come from polymer modification; numerous 'dyable' copolymers had already been reported. It was worthy of note that a similar solution, through copolymerisation, had been employed to achieve more ready dyeability in acrylic fibres. It seemed more likely, then, that polymer chemists would strive to improve the properties of existing fibres and, in particular, to 'tailor' their properties for specific uses. Polyamides of improved light resistance, for example, had already appeared and, while this property was not yet a limitation for polyester fibres, improvements could be achieved by incorporation of U.V. absorbers. The polyester fibres offered an example of the way in which properties can be 'tailored' for particular uses.

There was no doubt that the market for these fibres would be considerably broadened if they were more readily and cheaply dyeable to bright shades and if they did not pill in certain types of fabric, particularly knitted fabric. Some success in achieving these objectives had already been realised by the introduction of lower strength fibres based on copolymers, e.g. polythene, terephthalate/5-sulpho isophthalate, of low I.V., in which the compact molecular structure of the homopolymer is, to a degree, broken up. A problem which would continue to baffle the polymer chemist, however, was how to improve a particular textile property while leaving another, desirable, property unaffected; how, for example, to reduce pilling without affecting abrasion resistance or to improve dyeing properties without detracting from crease recovery.

World Rubber Consumption Estimated at 7M. Tons in 1970, Mostly Synthetic

THE paper on 'Elastomers in the 1960's' presented by Dr. W. F. Watson of The Rubber and Plastics Research Association of Great Britain, gave a brief resumé of the development of the rubber industry and then went on to outline some of the research and development work likely to have increasing technical impact during the 1960's.

World rubber consumption, it was estimated, would increase from 3.8 million tons in 1960 to 5.3 million tons in 1965 and 7.1 million tons in 1970, and the percentage of these totals which would be met by natural rubber was expected to decrease from 50% to 38% in 1965 and 31% in 1970. The pattern of consumption in the U.S. was very different from that in Europe, but the trend in Europe was in the same direction. The U.S.S.R. planned some 1½ million tons of synthetic rubber production and independence of the natural raw material by 1965; Western forecasts were that they would at least achieve 1.2 million tons. The many forecasts anticipated that consumption of natural rubber would level off during the 1960's at about 2 million tons annually, while the expanding gap between this and the

world's needs would be met by the synthetic rubbers.

The present production of *cis*-polyisoprene and *cis*-polybutadiene was of the order of thousands of tons a year, and in a year or two it was likely to rise to a level of around 100,000 tons a year. The relative position of the *cis*-polyisoprene and *cis*-polybutadiene was difficult to assess. Plant being erected was designed to accommodate synthesis of either.

A third stereo-specific claimant as a general purpose rubber was ethylene-propylene copolymer, made from the cheapest of all monomers envisaged for a rubber. A disadvantage met with in the tyre field, however, was the lack of adhesion. Dr. Watson thought, however, that vulcanisation problems, which might be a cause of the present hold-up, would be solved.

The general work-horse of the industry was butadiene-styrene copolymer. Oil extension and compensating polymerisation to higher molecular weight gave the cheapest general purpose rubber. As far as could be judged, about half the U.S. production was of oil-extended grades.

Another significant change now emerging was the supply of carbon black masterbatch. This was prepared by dispersing the carbon black in the polymerised latex by high-speed stirring or hydraulic injection followed by coagulation. Claims of improved tyre wear seemed vindicated. Apart from the larger tyre companies, this development was also likely to be of benefit to small companies which were not equipped with the heavy-duty machines for efficient mixing of carbon black powder into dry rubber.

Incorporation of one chlorine atom for every six or seven carbon atoms and one sulphonyl group for every 90 to 100 carbon atoms in polythene interrupted chain regularity so much that the modified polythene had rubber-like properties at room temperature. Cross linking was effected by hydrolysis with water

released from wood rosin of the sulphonyl groups and salt formation of the sulphonic acid groups with added lead or other metal oxide.

The promise forthcoming from systematic blending of polymers was well illustrated by nitrile polymers. P.V.C.-nitrile blends had improved resistance to atmospheric weathering and solvents, although at some expense in flexibility, creep and resilience. Blends of high nitrile-high styrene: butadiene copolymers and terpolymers were of considerable potential application, including for plastics pipe.

In concluding his outline of developments in various rubbers, Dr. Watson said that intense development was proceeding with fluorinated and other high temperature rubbers apart from the silicones, and likewise in polysulphides.

COMMON MARKET COMMISSION LISTS RECOMMENDED FOOD COLOURS

A LIST of regulations concerning permissible food colouring chemicals has been drawn up by the Common Market Commission, together with a board of Governmental experts from the six member countries, it was revealed in a statement issued by the Commission in Brussels. This list has been passed on to the Ministerial Council of the Common Market bloc as basis for a recommended standardisation of food colouring regulations within the area.

The list contains 28 colouring compounds and derivatives considered suitable for use both on the surface of a foodstuff and in its mass and a further seven compounds which would be permitted only for certain uses (e.g. surface colouring). Six further compounds would be banned three years after the coming

into force of the regulations unless the Ministerial Council decides differently. In the case of 35 other colouring materials, the six member countries' Governments would have to line their food laws up with the international ruling one year after the publication of the same. Within two years, at the latest, of the publication the proposed regulations would cover the sale of all food products within the Common Market area. The standpoint of the Association of Common Market Chemical Industries to the recommendations has also been forwarded to the Ministerial Council.

The proposed list is stated to contain also details of permissible solvents and purity levels, but not such compounds as combine colouring with aromatic or flavouring properties.

Canadian Buyers Visit Evans Medical



Five Canadian Government buyers, members of a delegation studying U.K. industry, visited the headquarters of Evans Medical Ltd. at Speke, Liverpool, recently and were conducted through several of the production departments. Seen here in the tablet department are (l. to r.): C. V. Marrin, Manitoba; M. Heath, Saskatchewan; B. L. McClean, Alberta; M. W. Davies, Board of Trade; L. H. Levasseur, Quebec; E. D. Lewis, Nova Scotia; and Mr. A. B. Goodall, Evans' public relations officer. The visit was arranged by the Board of Trade and sponsored by the Western Hemisphere Exports Council

Further Penicillin Developed by Beechams

REPORTS on clinical trials of another penicillin developed by the Beecham Research Laboratories were released at a symposium held in New York last week. The new penicillin—code number BRL 1400—is claimed to be active against staphylococci resistant to ordinary penicillin. The new penicillin has the advantage over methicillin introduced by Beechams last year in that it is given by mouth.

BRL 1400 is one of four oral preparations active against resistant staphylococci which are on clinical trial in the U.K. at the present time.

Until clinical trials are complete, no decision can be taken concerning the release of the compound for use in the U.K. However, a U.S. firm, Bristol Laboratories, is already satisfied with the preliminary trials and have been licensed by Beechams to produce the drug in the U.S.

Wellcome Develop 7-fold Sheep Vaccine

A VACCINE to control by a single 5-ml. injection seven clostridial infections which occur in sheep has been developed by the Wellcome Foundation. Vaccines which attack the infections either singly or in small groups have been available for some time but a full programme of immunisation has been practically impossible. It is claimed that with the new vaccine sheep can be treated at a twice-yearly gathering.

The development of the vaccine is the result of a 10-year programme aimed at overcoming two major problems—to give immunity against the seven infections with a dose one tenth the size previously given and to find a satisfactory way of combining the individual components with the necessary carrier. It is thought that both aims have been achieved.

Lederle and Boots Cut Drug Prices

BOTH Boots Pure Drug Co. and the Lederle Division of Cyanamid of Great Britain Ltd. have announced cuts in the price of drugs.

Boots are reducing the price of two recently introduced drugs—Aprinox (bendrofluazide) and Hydrenox (hydroflumethiazide)—by 20%, representing an estimated saving of £40,000 a year to the National Health Service. Lederle are cutting the price of three drugs—Leder-cort triamcinolone, Lederkyn sulphamethoxypridazine and Miltown meproamate. The saving to the N.H.S. in a full year in this case is expected to be £90,000.

Will

Mr. Alexander Milroy, formerly managing director of the Milroy Chemical Co., Ltd., Glasgow, who died on 23 June, left personal estate in England and Scotland valued at £25,992.

WATER POLLUTION LABORATORY EXTENSION OPENED

Effluent Study Undertaken for Industry

FURTHER legislation giving an increased control over the disposal of waste waters in recent years has led to a greater interest in pollution control and to meet the increasing demand from industry, local authorities and river boards for research on this subject, a new wing of the Water Pollution Research Laboratory, Stevenage, Herts, has just been opened.

The new wing provides nearly 20,000 sq. ft. of extra space, an increased capacity of about 40%, and contains one large and three smaller pilot scale laboratories. Building operations began in February 1960 and were completed in August of this year. The main contractors were Ekins and Co. of Hertford and the heating and water system was installed by Hopes. The buildings were designed in the Chief Architects Division of the Ministry of Works.

The work of the laboratory falls into two main categories. The first is the investigation of methods of treating polluted liquids prior to their discharge both to increase the efficiency of existing methods and to develop new ones, and the second is the study of surface waters in order to determine the effects of pollution.

Detergent Problem

Part of the work of the laboratory which has been going on for some time is the investigation of the effect on the problem of foaming of the use of biologically 'soft' detergents. The results of what has become known as the Luton experiment, are encouraging. Although some of the old type of detergent still found its way into the Luton area, it was found that the amount of surface active matter discharged to the River Lee from Luton Sewage Works was reduced by about 40%. More recently the new type of detergent has been more widely distributed in the South of England in order to increase the percentage of the new detergent used in the Luton area.

Another investigation which effects the removal of synthetic detergents is a comparison of the efficiency of four types of filter media in pilot scale filters. Each type is being tested in two sizes, 1 in. and 2½ in. Over a period of two years, the smaller media have produced more satisfactory effluents than the larger, and the media with rougher surfaces have been more efficient than those with smoother. These results have been the same whether performance was measured by removal of biochemical oxygen demand, of bacteria, of synthetic detergents or by oxidation of ammonia.

In considering the effects of pollution on streams it is necessary to know the worst conditions likely to occur, and for this purpose regular determinations over

24 hours are needed. The development of automatic instruments is therefore of great importance and the laboratory has developed instruments which will measure automatically the concentrations of dissolved oxygen and suspended matter.

It is also frequently necessary to determine low concentrations of materials in solution, and a section of the laboratory is engaged in developing methods of analysis suitable for the purpose. In a new method recently developed for the deter-

FISONS' CARBYNE WILD OAT KILLER GIVEN GOVERNMENT APPROVAL

THE Ministry of Agriculture, Fisheries and Food has accepted Carbyne—the wild oat killer—for use on cereals. It was announced by Fisons Pest Control Ltd. last week. The chemical is now a free product which can be advertised and released generally instead of only under very strict control as before.

Following work in Fisons laboratories and the experience of the Spencer Chemical Co. of the U.S., it was decided that Carbyne should be introduced to the farmer in 1961 on a controlled basis with technical assistance for the farmer on a larger scale than before. Carbyne has proved to be satisfactory. Statistical analysis is not yet complete but enough has been done to indicate that the wider usage of the chemical has resulted in a similar degree of wild oat control as that seen in 1960—around 84%. In spring wheat the yield increases have been up to 19.3% and 22.4% according to the type of wheat. The effect on winter wheat has been more marked with up to 50% increases recorded and one outstanding case of 102%.

The introduction of Carbyne to the farmers has required a big educational programme. The problem of wild oats has been an academic one to farmers until the time the heads of the plants actually showed above the crop. To be effective the application of Carbyne must be carefully controlled to coincide with a particular stage in the growth of the wild oat—when the plant is showing one to two leaves. The mechanism of the action of carbyne in the plant is not yet fully understood.

Carbyne is sold to the farmer as a concentrate which is mixed with water before application. It consists of an organic carbamate 4-chloro-2-butynyl-N(3-chlorophenyl carbamate) dissolved in a naphtha-type solvent with the addition of emulsifiers.

The active ingredient is not produced by Fisons at the moment but it could be if required. Fisons have stocks adequate

mination of organic carbon, complete oxidation of organic matter is ensured by burning the dissolved matter in oxygen. After the removal of water by condensation the carbon dioxide produced is determined by an infra-red absorption method. A modification of a published method for determining nitrate has been developed which is rapid, convenient and virtually free from interference.

Some types of industrial waste require special treatment even before they can be discharged into a sewer. The laboratory is equipped for investigating the best method for treating specific industrial wastes and is willing to undertake work of this kind for industry, a charge being made to cover the cost. This type of work has increased very greatly over the last two years and there is a clear indication that it meets a growing need.

to cope with an outbreak of wild oats such as occurred in 1960 which was the worst on record.

A new selective weedkiller has also been introduced by Fisons. Known as Banlene, it consists of a mixture of MCPA and one of the new methoxy-chlorobenzoic acids. As a result of tests it has been found that broadly speaking, Banlene will control MCPA-susceptible weeds and will give a better control than MCPA of redshank, black bindweed, knotgrass, corn spurrey, spring germinated chickweed and hempnettle.

Banlene is the first hormone weedkiller to be approved under the new Ministry of Agriculture, Fisheries and Food Approval Scheme before release for sale.

S.I.M.A. Team to Visit Italy

A TEAM representing members of the Scientific Instrument Manufacturers' Association is to visit Italy from 23 to 31 October. Annual value of output of this U.K. industry is more than £150 million of which some 27% is exported.

The visit is connected with the current interest in the Common Market and the aims to survey market prospects in Italy; to collect information on Italian needs; to exchange views with regard to improving co-operation; and to work out the best methods for keeping Italian circles properly posted on the activities of S.I.M.A.

First U.K. Showing of High-Temp. P.V.C. Pipe

A hot water circuit extruded from Geon p.v.c. is to be shown in action by the British Geon Ltd. at the Engineering Materials and Design Exhibition to be held at Earl's Court, London, from 13 to 18 November. This will be the first time that pipe produced in high-temperature resistant p.v.c. has been shown in this country.

U.S. Electrolytic Cell Completes Breathing System for Space Travel

AN electrolytic cell that operates under weightless conditions may provide a vital link in a workable chemical system that will convert an astronaut's breath into breathable oxygen during space voyages lasting up to two years. Battelle Memorial Institute, Columbus, Ohio, is now preparing a prototype model of the rotating cell for evaluation by U.S. aeronautical-medical experts.

In the experimental cell, well-established principles of electrochemical engineering are used in breaking water down into hydrogen and oxygen, the unique feature of the cell being its ability to operate efficiently independent of natural gravity. Conventional electrolytic cells depend upon the pull of gravity on the electrolytic solution in separating gas bubbles; the experimental cell operates in its own artificial gravity field, which is the centrifugal force produced as the cell rotates.

Development of the zero-gravity electrolytic cell dovetails with the recently announced completion, by Battelle workers, of a device that chemically converts the carbon dioxide in an astronaut's breath into carbon and water. The de-

vice can use the hydrogen produced by the electrolytic cell, while the cell, in turn, can make use of the water to produce more breathing oxygen. Thus, the two devices complement one another in maintaining a breathable atmosphere in a spacecraft for long periods without a supplemental supply of breathing oxygen. Space and weight limitations on voyages of extended duration make it impossible to carry the necessary oxygen in tanks or in the form of chemical compounds.

The cell is a drum-shaped unit about 3 ft. high that rotates at up to 500 r.p.m. The cylindrical unit comprises a stack of 16 individual electrolytic cells, alternate metal plates serving as anodes and cathodes. Interspersed between these plates are asbestos diaphragms—thin films that separate hydrogen from oxygen as these gases are generated on the electrodes. The gases are drawn from the chamber through separate collecting systems passing through the centre of the unit. A 500-W electrical input is required to electrolyse about 2 quarts of water a day—sufficient to provide oxygen for two men.

Montecatini's New Acrolein Process Uses Unsupported Copper Oxide Catalyst

A NEW process for the manufacture of acrolein has been developed by Montecatini and is described in *Chem. & Engg. News*, 9 October, p. 56. It is a direct oxidation of propylene with oxygen using a copper oxide catalyst. Workers at Montecatini decided that to produce high yields of acrolein from the oxidation of polypropylene, it was essential to have a uniform temperature in the reaction zone and a large catalyst surface. In order to produce these conditions they designed a reaction tube of small bore copper tubing wound in a spiral. This is immersed in a heat transfer medium boiling at 350° to 400°C. The flow of propylene, oxygen and steam through the reaction tube causes the formation of a thin layer of the catalysing copper oxide on the inner surface of the tube.

The new process is similar to that used by Shell Chemical except that Shell use a supported catalyst. Most acrolein, however, is produced by a gas phase catalytic condensation of formaldehyde and acetaldehyde. Distillers' ammoxidation procedure for acrylonitrile is a one stage process which skips the isolation of acrolein, although the original research by Distillers in this field was begun in two stages—converting acrolein to acrylonitrile and oxidising propylene to acrolein.

The thin layer catalyst gave good yields in laboratory tests, comparing favourably with those obtained with a supported copper oxide catalyst, although

g. per hour per litre of reaction volume (unit capacity) is lower.

Removal of the water vapour diluent, and hence producing higher capacity, is not possible with a supported catalyst since temperature control is insufficient. In the Montecatini reactor, however, the reaction occurs at the wall and the heat is immediately removed by the transfer medium. Reaction temperature can, therefore, be controlled within a few degrees. This results in the same high yields as produced with the diluent and a higher unit capacity. Finally an increase in partial pressure of the reactants to 4 atm. from the one atm. at which the supported catalyst process works gives the highest yield of acrolein although a 2 atm. partial pressure gives the highest unit capacity.

Montecatini have built a pilot plant operating on this process using a 4:1 to 5:1 propylene to oxygen ratio and a temperature of 390°C, a contact time of 0.5 secs. and a pressure of 4 atm. Under these conditions the plant produces some 600 g. of acrolein per hour per litre of reactor volume.

Russian Welding Journal

Translation into English of all 12 issues of the Russian welding journal *Avtomaticheskaya Svarka* (Automatic Welding) for 1960 has now been completed by the British Welding Research Association, Abington Hall, Cambridge.

I.C.I. Nobel Develop New Types of Plaster

It will be some time before the committee set up to seek new projects for manufacture by I.C.I. Nobel Division bears fruit. This was stated recently by division chairman Dr. J. M. Holm. Two new types of plaster have been evolved in the research and development department, which is felt are "an outstanding advance to the building trade". Should they succeed, a substantial tonnage of a Nobel product would be used as an essential ingredient.

Reduced activity in other industries had affected sales in the first eight months of 1961 of the division's chemical products, except silicones, which had increased over 1960. This temporary setback to the division's extension into chemicals did not affect their determination for long-term expansion of sales at home and abroad.

Reduction in coal output, increasing mechanisation in deep mining and expansion in the use of alternatives to explosives were combining to cut demand for the division's explosives. Demand from the main extractive industries gave a more encouraging picture and sales were expected to be maintained at last year's level. Dr. H. Holm stated, however, that competitors were extremely active and the threat from ammonia nitrate/fuel oil mixtures had not diminished.

New B.S.S. Lists Common Names for Pesticides

There is now a list of over 100 short and non-proprietary names, which are recommended for easier identification of pesticides; this list is contained in a revision of B.S. 1831 which has now been published. The full chemical names and structural formula are given with every compound, together with other non-proprietary names which have been used. The compounds are classified into four groups: insecticides and acaricides, fungicides, herbicides and rodenticides.

A list of chemicals for which it has been considered that common names are not required is included as an appendix, together with a list of common names considered by I.S.O. though not recommended in this British Standard. The standard is available, price 15s, from the British Standards Institution, Sales Branch, 2 Park Street, London W.1.

U.K.A.E.A. Film on Nuclear Power Reactors

A NEW United Kingdom Atomic Energy film called 'Nuclear power reactors' has been issued. Intended to be informative rather than highly technical, the film surveys the world's nuclear power reactor systems which are either already proven and in operation or are still under development. Largely by the use of animated sequences, it illustrates how cores, coolants and moderators are combined to form different systems.

The film, which runs for 35 min., is on loan from the Authority film library, 11 Charles II Street, London S.W.1.

Overseas News

Erdolchemie Plan £30 Million Expansion Programme

CONSTRUCTION of new plants under a DM340 m. (£30 m.) investment programme has just been started by Erdolchemie, the Dormagen, West Germany, subsidiary of Farbenfabriken Bayer and BP Benzin und Petroleum. A sum of more than DM300 million has been invested in the Dormagen site during the period 1957-61.

On completion of this further expansion programme, Erdolchemie will have the following annual capacities in metric tons:

Ethylene	...	...	tonnes	115,000
Ethylene oxide	...	...	36,000	
Ethylene glycols	...	...	32,000	
Ethane	...	...	54,000	
Propylene	...	...	110,000	
Propylene oxide	...	...	28,000	
Propylene glycols	...	...	7,000	
Acrylonitrile	...	...	25,000	
Butyraldehyde	...	...	12,000	
Butadiene	...	...	60,000	
Isoprene monomer	...	...	12,000	
Isobutylene monomer	...	...	12,000	
Di- and tri-isobutylene	...	...	45,000	
<i>n</i> -Butene 1, <i>n</i> -butene 2	...	...	50,000	

Increase of Phthalic Capacity in Spain

The Spanish firm of l'Industrias Quimicas de Luchana are planning to increase their phthalic anhydride capacity from 1,000 tons a year to 3,000 tons. The phthalic anhydride will be refined by distillation.

Commercial Solvents Acquire Sodium Glutamate Process

The acquisition by Commercial Solvents of the exclusive patent rights to a new microbiological process for the manufacture of monosodium glutamate will make the company the fourth largest U.S. manufacturers of the product. Commercial Solvents are in the process of converting two major units of their biological production facilities at Terre which harnesses a bacterial organism recently discovered in Japan. Production Haute, Ind. to deal with the new process, is planned to begin in June, 1962.

F.M.C. Will Be Fifth U.S. Producers of TDI

F.M.C. Corporation, who plan a toluene diisocyanate plant at Charleston, W.Va., will probably do so in the form of a partnership venture. Using the F.M.C. process (U.S. Patent 2,908,703), they will become the fifth U.S. producers in the field. Construction will start next spring, with on-stream date scheduled for late-1963. Other U.S. producers are Du Pont,

Mobay, National Aniline Division of Allied Chemical and Nopco Chemical, whose new plant is due on stream next year.

In addition, Allied Chemical are to build plant in Ontario to serve the Canadian market for TDI. This unit is due in production by late-1962.

Italian Production of TEL in India

The Italian Soc. Lavorazioni Organiche ed Inorganiche (S.L.O.I.) are to build in Bombay, in co-operation with a local company, plant for the production of tetraethyl lead. Initial output has been scheduled at 3,000 tonnes/year.

Sun Oil to Increase Propylene Capacity

The U.S. firm Sun Oil are to increase their propylene capacity by 180 million lb. a year to 300 million lb. at their Marcus Hook, Pa., refinery. Costing \$2.2 million, the new extension is expected to be completed during the second quarter of 1962. Feedstocks will come from the company's new \$9.3 million gas processing plant which is scheduled for completion in November of this year although it will not come into full production until the \$14 million catalytic cracking unit goes on stream, probably in October 1962.

Squibb to Produce Paints in Sicily

Squibb of the U.S. are to build plant for the production of paints in the industrial area of Priolo-Augusta, Sicily. Total investment will be about 10,000 million lire, 30% of which is being provided by the Regional Institute for Financing of Industries in Sicily.

Vanillin Production for Norwegian Firm

A/S Borregaard of Norway are to start production of vanillin at Sarpsborg in the next few months. Initial capacity of 200 tons/year will be sold through Dutch firms. Production will be based on waste sulphite liquor, a by-product of Borregaard's cellulose operations.

U.S. Financial Aid for Colombian DDT Project

A plant for the production of DDT and other insecticides is to be built near Bogota, the capital of Colombia, at a cost of 11 million pesos as a result of a contract signed between Fomento Industrial, of Colombia, and Pennsalt Chemical Corporation, U.S., the latter to supply some 37.5% of the necessary

financial backing. The plant, situated near the Zipaquirá saltmines, will produce 1,500 tonnes/year of DDT.

Belgian Interest in French Phosphoric Acid Plant

A phosphoric acid plant is to be built at Tonnay-Charente, France, by Asturonia, a new company to be formed jointly by Compagnie Royale Asturienne des Mines, of Belgium, and l'Office National Industriel de l'Azote, of France. Start of production is given as 1963. The parent companies of the operating concern, which will have an initial capital of 18 million French francs, will exchange know-how in the field of phosphoric acid production.

New Contract Research Company in Switzerland

Industrial contract research in the plastics and textiles fields is to be carried out by a new company set up in Switzerland under the name of Inrescor, Internationale Forschungs-Gesellschaft. The company, formed by Cluett, Peabody International AG Zug, Switzerland, and Heberlein Holding AG, Zurich, Switzerland, with a capital of SF3 million, will open a laboratory complex in Schwerzenbach near Zurich.

Further Move in Belgium Merger Plan

An extraordinary meeting is to be held on 6 November by Sidac to propose the merger with Union Chimique Belge, Fabelta and Compagnie Continentale du Pegamoid (see CHEMICAL AGE, 9 September, p. 358 and 16 September, p. 396).

The company will be known as Union Chimique-Chemische Bedriven (U.C.B.).

Ethiopia Seeks Equipment for Oxygen Plant

The Ethiopian chemical concern Soc. d'Electrochimie d'Ethiopia last week called for tenders for the supply of equipment for an oxygen plant, the project to be financed with a \$45,000 credit from the U.S. Development Loan Fund. Tenders, for which no latest date of arrival is given, should be sent to the company at P.O. Box 495, Addis Ababa, Ethiopia.

Nylon Plant for Venezuela

The Corporación Venezolana de Fomento recently announced its intention to help finance the installation of a nylon plant in Caracas. The plant will have a capital of 720,000 bolivares, supplied by the Corporation.

Grace Announce New Shrinkable Polypropylene Film

The Cryovac Division of W. R. Grace and Co., U.S., have announced the development of a new, shrinkable, polypropylene film. Known as Cryovac Y film, it is the first polypropylene to be biaxially oriented (stretched) in a balanced orientation process, a technique which makes the film shrink equally and uniformly in all directions. This is claimed to give it several unique advan-

tages, including the lowest moisture vapour transmission rate of any thermo-plastic film, which makes it a most effective moisture barrier film. It is also claimed to have a high balanced tensile strength with a rating of 21,000-27,000 p.s.i., or five to six times the strength of polythene.

Recovery of Naphthenic Acids in Crude Oils

A continuous process for the extraction of the naphthenic acids contained in petroleum oils has been developed by Oesterreichische Mineröl Verwaltungs AG, Vienna. Applicable to the naphthenic crude oils such as are found in Venezuela, Rumania and Austria, the process has been protected by Austrian patent No. 210977. The process will be exploited in the Schwechat refinery, near Vienna.

The process consists of neutralising naphthenic acids, by a solution of caustic soda. The next stage is separation of the solution of sodium naphthenate, the saponifiable and non-saponifiable materials subsequently being separated.

New \$6 M. Hydrogen Fluoride Plant for Kaiser Aluminium

Kaiser Aluminium and Chemical are to build a new \$6 million hydrogen fluoride and fluorocarbons plant adjacent to their alumina and caustic-chloride plants at Gramercy, La. The unit will be integrated with a \$1.4 million aluminium fluoride plant already being constructed on the site. This new plant is part of Kaiser's plan to make more of their own raw materials. It is expected to be completed towards the end of 1962.

Vinyl Chloride Monomer Price Increased

Allied Chemical have announced an increase of 0.5 cents a lb. in the price of their vinyl chloride monomer. The new price of 8 cents a lb. f.o.b. Moundsville, W. Va., will take effect from 1 November. Other vinyl producers, Monsanto and Union Carbide, say that they intend to follow Allied's lead. The other vinyl chloride manufacturer in the U.S., Dow, sell only on contract. The reason for the increase, say Allied, is higher production costs.

Organic Fertiliser Plant for Jamaica

A new Jamaican company, Jamaica Organic Fertilizers, established under the Industrial Incentives Law, expects to start production, early next year, of about 60,000 tons of fertilisers a year from household waste collected in Kingston.

New Ethylene-Propylene Plant for Germany

Farbwerke Hoechst AG and their subsidiary Knapsack-Griesheim AG have signed with Union Rheinische Braunkohlen Kraftstoff AG, of Wesseling, West Germany, an agreement under which the latter firm will erect a plant for the production of ethylene and propylene to come into production at the end of 1963.

Capacity for ethylene production is given as some 70,000 tonnes/year. Hoechst will purchase the greater part of the Wesseling ethylene and propylene production and a pipeline is to be laid for transport of the olefins from Wesseling to the Knapsack plant. It is known that the ethylene will replace acetylene as base product for acetaldehyde production at Knapsack.

Soviet Sulphuric Acid Output Rises

Soviet production of sulphuric acid in the first half of 1961 rose by 5% compared with January to June 1960, to a total of 2.8 million tonnes. Output of mineral fertilisers in the same period was higher by 12%, totalling 7.6 million tonnes.

Production of oil in the U.S.S.R. in the first half of this year amounted to 79.7 million tonnes, an increase of 13%, while output of synthetic and artificial fibres was up 22% to a total of 121,000 tonnes.

U.S. Sulphur in 1960

According to the official report of the U.S. Bureau of Mines, U.S. production of sulphur in 1960 was 6,660,541 long tons. U.S. consumption of sulphur at just under 5.9 million long tons was very close to production. Principal producers made about 20% of their sales overseas and for many of the smaller producers the percentage was much higher. Exports for the year amounted to 1,786,543 tons. It is estimated that export sales for 1961 will be 18% up on the 1960 level. The export sulphur business is expected to continue growing with annual increases of the order of 18% for the next 10 years.

Goodrich-Gulf Plan Plant Expansion

An 8% expansion of synthetic rubber capacity is planned by Goodrich-Gulf Chemicals Inc. at their West Virginia plant. The expansion will chiefly provide for more cold styrene-butadiene rubber.

Pakistan Seeks Chemicals

At the recent International Levant Fair held in Bari it was stated in connection with Pakistan's Five-Year Economic Development Plan, that the country will have to import a large quantity of equipment and materials. A

long list of imports includes 549 million rupees worth of chemicals and 233 million rupees worth of petrochemical products. The following are among the products sought: fertilisers, polythene, caustic soda, sulphuric acid, insecticides, pharmaceutical products, cellulose, essential oils, starch, tannin, acetylene, acrylonitrile, p.v.c. etc.

Petrochemical Project in Argentina

Annually some \$29 million are to be saved by the Argentine in foreign currency for imports by the planned construction by PASA Petroquímica Argentina SA of a petrochemical complex costing \$72 million. The plant will produce chemical intermediates and synthetic rubber. For the financing of the scheme it is planned to float a subordinated bond loan of \$18.5 million repayable in five or 10 years.

'Largest' Coke Chemical Plant for Russia

Construction has begun on the coke and chemical plant, claimed to be largest of its kind in Europe, of Avdeyev, near Stalino, in Russia. Eight coke oven units are to be built, each of 77 ovens with a volume of 30 cu. m. The capacity of the plant is said to be 200,000 tons per year more than the U.S. plant at Bethlehem, Pa. The central refining department will produce one million tons of coal tar a year.

It is planned to establish research institutes for organic chemistry, power engineering and coal chemistry in the vicinity of the combine.

ANIC Plan 60,000 Tons of Aromatics at Gela

At a recent meeting of Anic shareholders, Mr. Enrico Mattei, president of the parent E.N.I. Group, stated that the new plants which the company was building at Gela, Sicily, would have the following yearly capacity:

	Tonnes
Gas oil	550,000
Gasoline	530,000
Petroleum coke	250,000
LPG	200,000
Ammonium sulphate	165,000
Urea	100,000
Aromatic hydrocarbons	60,000
Ethylene	50,000
Polythene	25,000

Naphtachimie Complete Ethylene Expansion

NAPTACHIMIE have completed expansions at their Lavera works. France, which has raised the ethylene capacity to 48,000 tonnes a year. More than 40 different chemical products are now made including ethylene oxide and its derivatives, isopropyl alcohol, propylene oxide and derivatives, butadiene, polyisobutylene—high density polythene, and polypropylene.

Naphtachimie will now start a new expansion programme. The first stage will include the construction of an ethylene

cracking unit with an initial annual capacity of 30,000 tonnes, and capable of being expanded to 50,000 tonnes/year. This would give Naphtachimie a potential capacity to make nearly 100,000 tonnes of ethylene a year. Existing units for butadiene and propylene oxide will be extended and a new unit will be built to produce dichlorethane. Work on this first stage will start immediately. At a later date the new programme will be completed by the development of other existing units.



First the miner digs... with pick, jackhammer, explosive blast. He brings in a load rich with possibilities, yet much work remains to be done... by quick-acting chemicals which separate the valuable mineral from the worthless rock. In mining, as in other fields, Dow chemicals and Dow technology are the new tools which speed processing, by-pass laborious physical operations, help industry create better products at lower cost.



TRADE NOTES

Hygrotherm London Office

Hygrotherm Engineering Ltd. have now moved their London office to Empire House, 414 Chiswick High Road, London W.4 (telephone: Chiswick 0094).

Gas Chromatography Materials

The second edition of the May and Baker booklet on 'Materials for gas chromatography' has just been published. The first edition was produced three years ago and such has been the progress in this rapidly developing field that a number of revisions and corrections have had to be made.

An innovation in the May and Baker policy is the introduction of the first members of a new range of specialised stationary phases which are currently attracting attention in the literature. These materials are purified but are not as yet standardised.

Synthetic Crystals

A new section 'P' of the Hilger and Watts loose-leaf catalogue gives details of the different types, sizes, mountings and resolutions of the complete range of Hilger crystal phosphors and crystal-photomultiplier assemblies. The section on optical crystals lists the complete range of types and sizes, together with information on refractive indices, approximate transmission limits and physical properties. Copies are available from Hilger and Watts Ltd., 98 St. Pancras Way, Camden Road, London N.W.1.

Industrial Instruments and Controls

Two new illustrated pamphlets have been issued by James Gordon and Co. Ltd., Dalston Gardens, Stanmore, Middlesex. No. 163 deals in some detail with the Mono range of gas analysis recorders for two and three constituents and also includes various notes on other types of

Mono recorders available. No. 131 deals with the Gordon range of pneumatic servomotors and their uses.

Cellulose Film

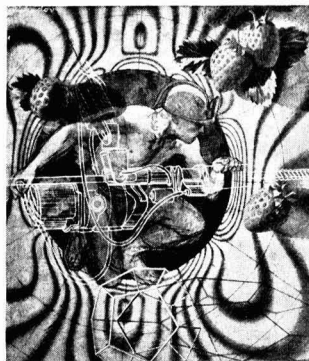
The various types of Cellophane cellulose film and their uses are summarised in a well illustrated booklet from British Cellophane Ltd., 9 Henrietta Place, London W.1. Properties and typical uses are tabulated, while further sections of the booklet discuss sealing and closure methods, available forms of the film, and tabulate nominal yields and weights of typical films.

Goodyear Changes

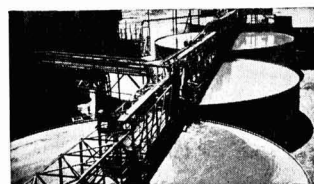
Changes in the framework of their Industrial Products Sales Division have been made by the Goodyear Tyre and Rubber Co. (Great Britain) Ltd. This division, under its manager, Mr. J. T. Pearson, has now been strengthened by the appointment of two marketing supervisors, Mr. W. R. Quick (those products) and Mr. H. F. Escott (belting products). At the same time two additional sales engineers, Mr. C. Brown and Mr. P. Bedford, together with experienced senior staffmen, have been appointed to the division's Southern and Northern offices at London (46 Holloway Road, N.7) and at Manchester (24 Broughton Street) respectively.

Polystyrene Adhesive

A new adhesive, Evo-Stik Impact Adhesive SL 863, for bonding polystyrene to wall or ceiling surfaces has been developed by the Industrial Adhesives Division of Evode Ltd., Common Road, Stafford. The application of the adhesive needs only hand pressure. One gall. will coat approximately 8 to 10 sq. yds. of polystyrene foam. The cost is 21s 6d a gall. to the industrial user.



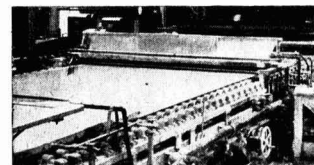
The miner symbolizes the role of Dow research in the chemistry of mining. The strawberries? They stand for agriculture, another field where Dow chemicals contribute to abundance. The background stress pattern represents Dow leadership in plastics for modern living.



Mining. Dow chemicals—Separan* flocculants, flotation reagents, and Dowfroth* frothers—help recover valuable minerals quickly and economically.



Urethane Foams. Dow produces Vorane* chemicals for manufacture of both flexible and rigid urethane foams of highest quality for seat cushions, refrigeration insulation.



Separan* flocculants for the pulp and paper industry increase filler retention and speed clarification processes.

* Trademark of the Dow Chemical Company

For information on any of Dow's products and services, contact:

Dow Products Division

R. W. GREFF & CO., LTD.

Garrard House, 31/45 Gresham St., London, E.C.2

Telephone: MONarch 1066

**DOW CHEMICAL
COMPANY
(U.K.) LIMITED**



48, Charles Street, London, W.1.
Telephone: GROsvenor 3601

Market Reports

STEADY DEMAND FOR COAL TAR PRODUCTS

LONDON Market conditions show little change, with most sections reporting a steady flow of new enquiry for spot or nearby delivery. The volume of business for shipment has been maintained on a satisfactory scale despite keen competition. Prices for the most part are well held at recent levels.

Demand for fertilisers has been no more than fair, while in the coal tar products market there has been a steady movement into consumption against contracts, with no special feature to record.

SCOTLAND The improvement in trading conditions referred to last week has been fully maintained. Buying has been brisk in most sections of industry and the range of chemicals has been varied. Emphasis is still on the delivery

position with a good proportion of demands for immediate requirements. Quantities in the main have been at the usual level, but some increases were noted. There is still a good volume of enquiries for export, with those for Commonwealth countries featuring well.

MANCHESTER Prices for the most part have been steady to firm. Home industrial users are specifying for satisfactory deliveries against contracts and fresh bookings, mainly for spot and near delivery positions, have accounted for a fair aggregate quantity.

On export account, moderate buying interest has been in evidence and supplies are moving reasonably well against old commitments. A quietly steady demand for the light and heavy tar distillates is reported.

● **Mr. J. P. M. van Waes**, director of the chemical section of Staatsmijnen (Dutch State Mines), of Limburg, is to be general director of Compagnie Néerlandaise de l'Azote (as from 1 January 1962). He will succeed the Belgian Baron Riccardo de Grenet, who as from that date will take over responsibilities for the activities within the Benelux area of the Montecatini company, of Milan.

● **Mr. G. F. Edwards** has been appointed general manager (production) by F. W. Berk and Co. Ltd. He will be responsible to **Mr. F. A. Rivett**, director, for all production at the company's works at Stratford, Baynards (Sussex), Wolverhampton, Swansea, Sandridge, London Colney and Edmonton. His headquarters will be at Abbey Mills, Stratford, E.15.



M. J. C. Hutton-Wilson, newly-elected vice-chairman, Association of British Chemical Manufacturers, is chairman of Associated Chemical Companies Ltd.

● **Mr. H. Warson** has been appointed development manager (polymers) of Dunlop Chemical Products Division and, in consequence, has resigned his position with Vinyl Products Ltd.

● **Mr. C. R. Porter** has been appointed general manager of the Droitwich manufacturing division of Witeco Chemical Co. Ltd., where production activities embrace latex compounding, reclaimed rubber dispersions, starch and polymer adhesives, vinyl and acrylic copolymers, solvent adhesives and chemical dispersions.

● **Mr. D. Ross** has been appointed information officer to John and E. Sturge Ltd., manufacturers of citric acid and calcium carbonate. He was formerly



Gordon D. Allen, London manager, Roger Williams Technical and Economic Services Inc., seen with **V. W. Mimouni**, market research manager for Shell Saint-Gobain, at the meeting held in Paris last week to consider the formation of a European Chemical Market Research Association ('Chemical Age', 14 October, p. 592)

PEOPLE in the news

with the Distillers Co. Ltd. at their Great Burgh, Epsom, research department.

● **Mr. Julio J. Usera** has joined the recently formed International Division of Hooker Chemical Corporation in New York. His title: director of sales. He has been in a similar field with Monsanto Chemical Co. for the past 15 years, and since 1959 has been director of sales of their Overseas Division.



Samuel W. McCune

● **Mr. Samuel W. McCune III**, deputy managing director of the Du Pont Co. (United Kingdom) Ltd., was appointed managing director, on 1 October, to succeed **Mr. William H. McCoy**, who returns to the U.S. on special assignment with the parent company in Wilmington. A graduate in chemical engineering of Princeton University, Mr. McCune has had over 20 years' experience in elastomers research and sales work. He joined the parent company in the U.S. in 1940 as a chemist in the rubber laboratory and from 1945 to 1955, he held a number of supervisory and managerial positions in elastomers sales. In 1955 he became a district sales manager for elastomer chemicals and two years later joined the U.K. Du Pont company as general sales manager. Mr. McCune was appointed deputy managing director in May this year. Mr. McCoy, who joined Du Pont in 1942 as a chemist, became project manager for the neoprene plant to be built in Northern Ireland in 1956, and in 1959 he became managing director.

● **Ing. Piero Giustiniani**, managing director, of Montecatini, left Milan for Tokyo on 11 October to finalise agreements between his company and the Mitsui Chemical Industry, Mitsubishi

Petrochemical Co., and Sumitomo Co. concerning the production in Japan of polypropylene resins and fibres, utilising Montecatini's patents.

● **Mr. Ivor Sanderson**, a director of Premier Oil and Cake Mills Ltd. has been elected president of the Compound Animal Feeding Stuffs Manufacturers' National Association for 1961-62.

● **Mr. C. A. C. de Boinville**, deputy of chairman of the U.K. Unilever Milling Group has been nominated for election as president of the International Association of Seed Crushers at the annual meeting to be held at Cannes in June 1962.

● The Sheepbridge Engineering Group announce the appointment of **Mr. J. T. Davenport** as general manager of Sheepbridge Equipment Ltd. (Foundry Division), Chesterfield. **Mr. W. McLelland**, of Whitley Bay, succeeds Mr. Davenport as foundry manager of Sheepbridge Alloy Castings Ltd., Sutton-in-Ashfield, Notts.

● **Mr. W. Lindsay Burns** has relinquished his executive duties with the Balfour group of companies but remains as a director and chairman of the board and also in a consultative capacity in these companies.

● **Sir Laurence Merriam** has been appointed a director of Distillers Ltd. He is also chairman of British Xylonite and a director of Ilford.

● **Mr. Irving C. Smith**, of Monsanto Chemical Co., St. Louis, U.S., will transfer to Italy to become deputy managing director and a member of the executive committee of Sicedison SpA of Milan. Sicedison are 40% owned by Monsanto

DIARY DATES

MONDAY 23 OCTOBER

S.C.I.—London: 14, Belgrave Sq., S.W.1., 6.30 p.m. 'Chemical structure & electrical properties of high polymers' by W. Reddish.

TUESDAY 24 OCTOBER

S.C.I.—Belfast: 7: Chemistry Lecture Theatre, Queen's University, Stranmillis Rd., 7.45 p.m. 'Bonding in three co-ordinate boron-nitrogen systems' by Dr. M. F. Lapper.

S.A.C.—Nottingham: Research Department Lecture Theatre, Boots Pure Drug Co. Ltd., Remfryfoot St., 6 p.m. 'Recent investigations into sedimentation methods of particle size analysis', by B. H. Kaye. 'Automatic scanning instruments for counting and sizing microscopic particles', by W. H. Walton & 'The use of an electrolytic resistivity method (Coulter counter) for particle size analysis' by I. C. Edmundson.

WEDNESDAY 25 OCTOBER

S.C.I.—London: 14, Belgrave Square, S.W.1., 6.15 p.m. Nutrition Panel meeting. 'Foods low in salts'.

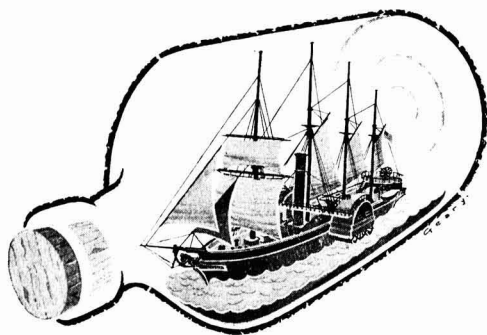
THURSDAY 26 OCTOBER

F.S.—London: Lecture Hall, Geo. Soc., Burlington House, Piccadilly, W.1. 'Water and effluent: the law and the practice', by J. B. C. Carr, J. C. Pinder & D. H. Sharp.

R.S.—London: Burlington House, Piccadilly, W.1. Symposium on 'Biochemistry & nutrition' at 10.30 a.m.

FRIDAY 27 OCTOBER

S.A.C.—Lancaster: College for Further Education, Torrisholme Road, 7.30 p.m. 'The analysis of edible oils contaminated with synthetic ester lubricants' by G. B. Crump.



**IT'S A SMALL WORLD
AND MARCHON SURFACTANTS PLAY A BIG PART IN IT**

It's plain sailing for chemical manufacturers in many parts of the world, for Marchon ships much of its output of surfactants to overseas customers. Buyers in more than 50 countries rely on Marchon's raw materials.

PRIMARY FATTY ALCOHOLS

These are essential raw materials for a large number of chemical processes, and are of special importance to the cosmetic and detergent industries. Marchon are the only manufacturers in Great Britain with the full range of C8-C18 even-numbered homologues. Why not write for data, samples or advice?

Marchon

Commercial News

Allen and Hanburys

Group sales of Allen and Hanburys, controlled by the Glaxo Group, both home and exports showed an increase for the year ended 30 June 1961, according to the annual report. The overall profit margin was slightly better than for the previous year.

Dunlop Rubber

Group profit of Dunlop Rubber Co. for the half-year to 30 June totalled £6.94 million (£6.75 million in the same period of 1960). After tax and minority interests, the profit attributable to the company was £2.7 million (£2.81 million). Sales for the half year were £133 million (£136 million); exports were a record, increasing by 16%. Margin of pre-tax profit, in relation to turnover, was 5.2% (5%).

Greeff-Chemicals

Greeff-Chemicals Holdings Ltd. have declared an interim ordinary dividend in respect of the year ending 31 December 1961 of 7½% less tax, on the ordinary stock units of 5s. The dividend is to be paid on 1 November 1961.

I.S.R.

International Synthetic Rubber Co. Ltd. report a profit, after tax, for 1960, of £868,407 (£761,000). A dividend of 16% on its paid-up capital of £3 million was declared in 1960. I.S.R. are a consortium of Dunlop, Firestone, Michelin, Good-year, North British, Avon, Pirelli and BTR Industries.

The company produced 80,700 tons of rubber in 1960, exporting 25%.

Ased

The Belgian chemical producers, Soc. Ammoniaque Synthétique et Dérivés (Ased), announce from Brussels that Cities Service Co., U.S., have taken over a minority holding. This holding is believed to be in the nature of 25%. Other shareholders are the Belgian holding company Evence Coppee et Cie., Brussels, and the Italian chemical company, Montecatini.

Delta Chemie

Montecatini, Milan, and the Dutch group of Delta Chemie have signed an agreement giving the Italian company an interest in the latter. Delta Chemie produce compound fertilisers and nitrogenous products.

Dow Chemical

Sales of the Dow Chemical Co., Midland, Mich., for the quarter ended 31 August totalled \$210,035,000 (\$208,310,000 in the same period last year). Earnings were 61 cents/share (67 cents).

Du Pont

Third quarter sales of E.I. du Pont de Nemours and Co. totalled \$552 million

- Better Margins for Allen and Hanburys
- Montecatini Interest in Dutch Fertilisers
- Third Quarter Results for U.S. Companies
- Big Capital Rises for Italian Producers

(\$531 million) with earnings equal to \$2.11/share (\$1.96). Nine months sales totalled \$1,628 million (\$1,628,367,000) with earnings equal to \$6.11/share (\$6.28).

Eastman Kodak

Third quarter sales of Eastman Kodak totalled \$234.9 million (\$229.7 million) with earnings equal to 88 cents/share (84 cents). In the nine months period, sales totalled \$649,269,000 (\$646,945,000), or \$2.16/share (\$2.27).

Hercules Powder

Third quarter earnings of Hercules Powder Co. totalled 82 cents/share (85 cents).

Monsanto Chemical

Third quarter earnings of Monsanto Chemical Co. were equal to 56 cents/share (57 cents). Nine months earnings were equal to \$1.83/share (\$1.98), lower earnings being recorded despite increased sales.

Mineraria Monteponi

Majority shares in Mineraria Monteponi, who operate mines at Iglesias, Sardinia, has been purchased by Montecatini. Modernisation of these mines will be carried out at an early date.

Petrochim

Société Chimique des Dérivés de Pétrole (Petrochim), of Belgium, show a deficit of B.Fr. 78,450,000 for the past financial year, this increasing the company's total losses to B.Fr. 191,700,000. The company attributes the unsatisfactory result—for the 12-month period ended 30 June—to competition on the home market. Petrochim plan to increase capacities and reduce operational costs.

Reichhold Chemicals

Quarterly cash dividend on common stock of Reichhold Chemicals Inc. is 5 cents/share (15 cents); a stock dividend of 2% is also declared.

Rumianca

At the recent annual meeting of Rumianca it was reported that sales to 31 August had risen by about 15% in spite of considerable price reductions. Rumianca will carry out a large-scale production programme in Sardinia with production expected to start during the first quarter of 1964 when the planned Cartosarda power station will start operating, using local brown coal.

Several U.S. and European companies are interested in Rumianca's Sardinian schemes, but it is probable that the Italian company will handle most of these projects by itself, although glycerine, perchloroethylene, and trichloroethylene will be produced by a company to be set up jointly by Rumianca and Pittsburgh Plate Glass, using the patents of the U.S. concern.

Sasol

Profits of Sasol for the year ended 30 June, after depreciation, totalled R2,594,678 (R1,259,412). Turnover totalled R17.9 million (R16.4 million), with chemical products accounting for more than R6.6 million of the total.

At the recent annual meeting, Mr. P. E. Rousseau, chairman, said that it should be possible to make fuel gas available to both industrial and domestic consumers at attractive prices. If gas were extracted from the Sasol process, additional facilities, from the production of coal up to production of synthetic gas, would have to be installed.

Snia Viscosa

The Italian Snia Viscosa group, responsible for the production of 55% of all Italy's synthetic fibres, reports a satisfactory balance for the first half of the current year. Production capacities are fully in use, in response to lively demand both at home and abroad. New investment programmes are progressing such that it may be possible to open up certain new capacities sooner than planned.

INCREASES OF CAPITAL

The Italian Government has authorised a number of companies to increase their capital. The list includes the following chemical and petrochemical companies: Anic S.p.A.—from 36,000 to 72,000 million lire; Anic-Gela S.p.A.—from 500 to 12,000 million lire; Esso Standard Italiana—from 10,000 to 20,000 million lire; Mobil Chimica Italiana S.p.A.—from 1,250 to 4,000 million lire; Applicazioni Chimiche S.p.A.—from 3,500 to 5,000 million lire; Soc Chimica Dell'Aniene S.p.A.—from 3,000 to 4,000 million lire; Soc Italiana Resine Gulf—from 500 to 1,000 million lire.

COMPAGNIE BELGE POUR LES INDUSTRIES CHIMIQUES, a member of the Belgian Empain group, are on 26 October to suggest to their shareholders a capital increase of from B.Fr. 50 million to B.Fr. 100 million.

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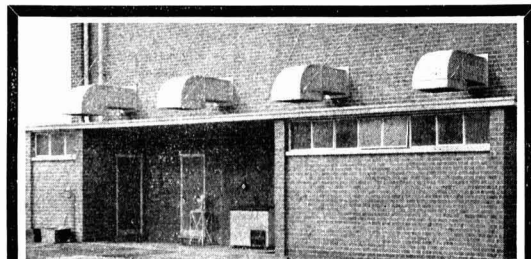
The first summer's operation of their No. 1 Polyethylene Pilot Plant at Carrington, brought this home to Shell Chemical Co. Ltd. So they called in Colt to improve conditions.

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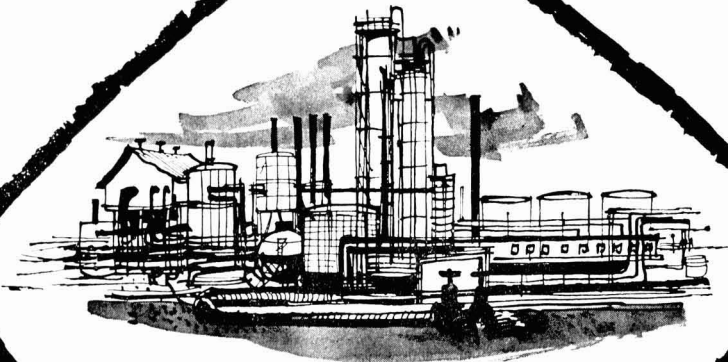


Four of the eight Colt filtered air inflow units in the No. 2 Pilot Plant at the Carrington Research Laboratories of Shell Chemical Company Ltd., nr. Manchester.

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Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

ACCEPTANCES

Open to public inspection 22 November

- N,N'-Substituted piperazines. Laboratoire Sapos. **883 013**
 Glucuronic acid derivatives useful as intermediates in the production of antibacterials, and the production of said derivatives. Chugai Seiyaku Kabushiki Kaisha. **882 843**
 Potassium fertilisers. Kaliwerk Stassfurt Veb. **882 996**
 Azo-dye-stuffs containing haloacylamino groups and their manufacture and use. Ciba Ltd. **882 750**
 Separation of sterols. Upjohn Co. **883 058**
 Process for the purification of triaryl phosphates. British Celanese Ltd. **883 065**
 Dihydrazide-formaldehyde condensates suitable for treating textiles. Olin Mathieson Chemical Corp. **882 998**
 Oxidation of hydrogen cyanide. Röhm & Haas GmbH. **883 110**
 Metallisable azo dye-stuffs containing sulphonionide groups and metal complex compounds thereof. Badische Anilin- & Soda-Fabrik AG. **883 131**

- Refining of alcohols. Monsanto Chemical Co. **882 946**
 Epoxy resin compositions. National Research Development Corp. **882 889**
 Chromiferous monoazotriazine-dye-stuffs, their manufacture and use. Ciba Ltd. **882 890**
 4-Substituted-4-phenyl-piperidines and processes for the preparation thereof. Thomae GmbH, Karl. **882 891**
 Modification of vinyl halide copolymers. American-Marietta Co. **883 070**
 Phenolic antioxidants. Distillers Co. Ltd. **883 033**
 Phenothiazine-derivatives. Delmar Chemicals Ltd. **882 894**
 Solvent dyes comprising salts of cationic dye-stuffs. Imperial Chemical Industries Ltd. **882 837**
 Germicidal composition. Carlen Corp. **882 860**
 Method of treating polyvinyl alcohol so as to improve its dyeability. Kurashiki Rayon Kabushiki Kaisha. **883 037**
 Manufacture of diazine pigments in a finely divided form. Ciba Ltd. **882 986**
 Process for the preparation of an alcohol by hydration of a gaseous olefin. Montecatini. **883 039**
 Recovery of glycols. Imperial Chemical Industries Ltd. **883 040**
 Production of conjugated diolefins and oxetanes. British Hydrocarbon Chemicals Ltd. **882 885**
 Production of conjugated diolefins. British Hydrocarbon Chemicals Ltd. **882 923**
 Production of oxygenated organic compounds. British Petroleum Co. Ltd., Turner, R., and Mieville, R. L. **882 863**
 Process for the extraction of hydrocarbon. Olin Mathieson Chemical Corp. **882 808**
 Method of curing polyurethane elastomers and products resulting therefrom. United States Rubber Co. **882 738**
 Process for the production of carboxylic acids. Shell Internationale Research Maatschappij N.V. **883 142**
 Process for producing monobromacetic acid and

- derivatives thereof. Schwerdle, A., and Schwerdle, M. L. **882 854**
 Vulcanisation of butyl rubber. United States Rubber Co. **882 855**
 3-Substituted-3-pyrrolidinols. Mead Johnson & Co. **882 813**
 Anhydrous germicidal compositions. Cesebrough-Ponds Inc. **882 742**
 Preparation of trialkylaluminium compounds. Continental Oil Co. **883 041**
 Neutral merocyanine dyes. Du Pont de Nemours & Co., E. I. **882 858**
 Method of purifying naphthalene. American Cyanamid Co. **883 042**
 Process for making cyclopentadienyl nickel nitrosyl compounds. International Nickel Co. (Mond) Ltd. **882 747**
 Process for preparing cyclohexylsulphamic acid and cyclohexylsulphamates. Abbott Laboratories. **882 952**
 Amines. Goodrich Co., B. F. **883 084**
 Catalytically active material. Esso Research & Engineering Co. **882 958**
 Processes for the production of phenol. Phenolchemie GmbH. **883 085**
 Process for making alkali metal metabolates and compositions containing same. United States Borax & Chemical Corp. **882 972**
 Crystalline polyvinyl formate and highly crystalline polyvinyl alcohol derived therefrom and methods of producing same. Kurashiki Rayon Kabushiki Kaisha. **882 766**
 Vitamin-A esters and a process for the manufacture thereof. Hoffmann-La Roche & Co. AG., F. **882 768**
 4:4-diaminostilbene-disulphonic acid derivatives and their use as optical brightening agents. Ciba Ltd. **882 769**
 Glucuronic acid derivatives useful as intermediates in the production of antibacterials, and the production of said derivatives. Chugai Seiyaku Kabushiki Kaisha. [Divided out of 882 843.] **882 844**

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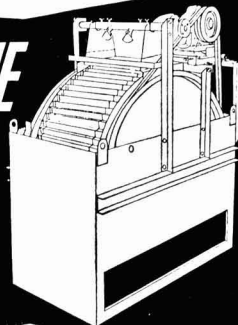
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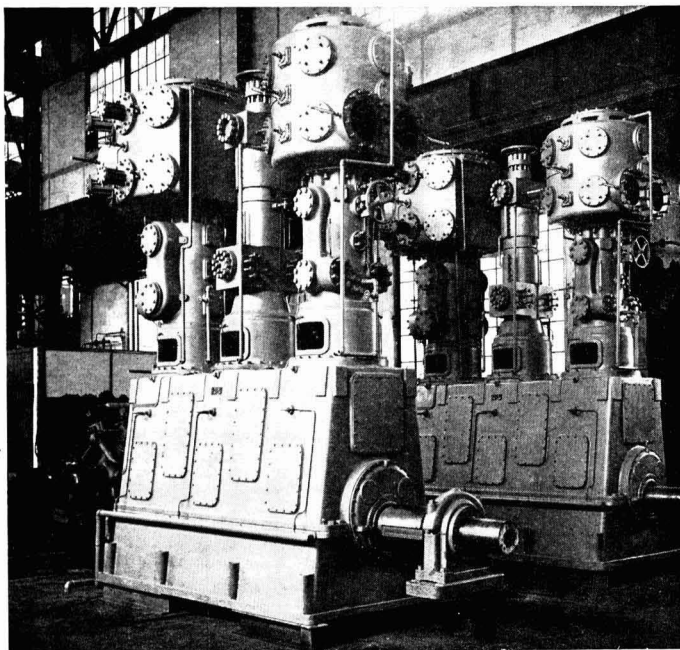
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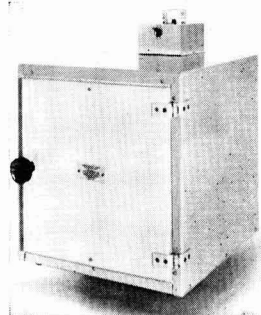


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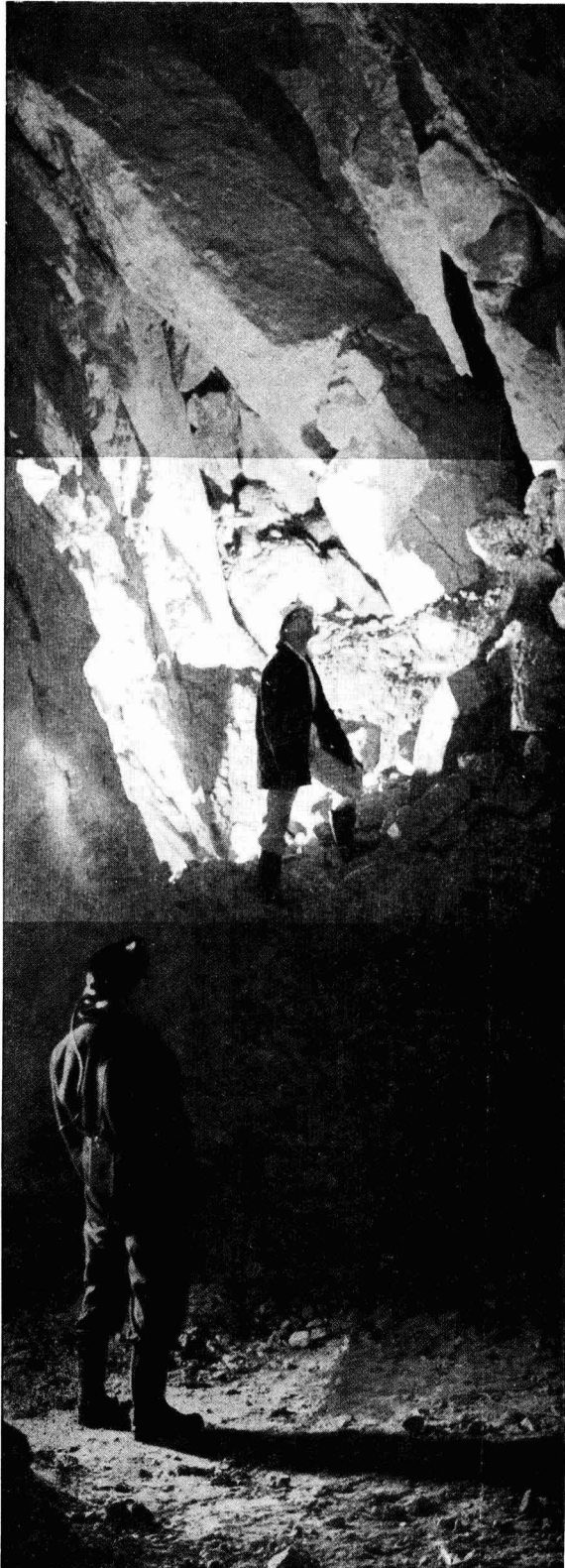
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