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28 April 1962. Vol. 87. No. 2233

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



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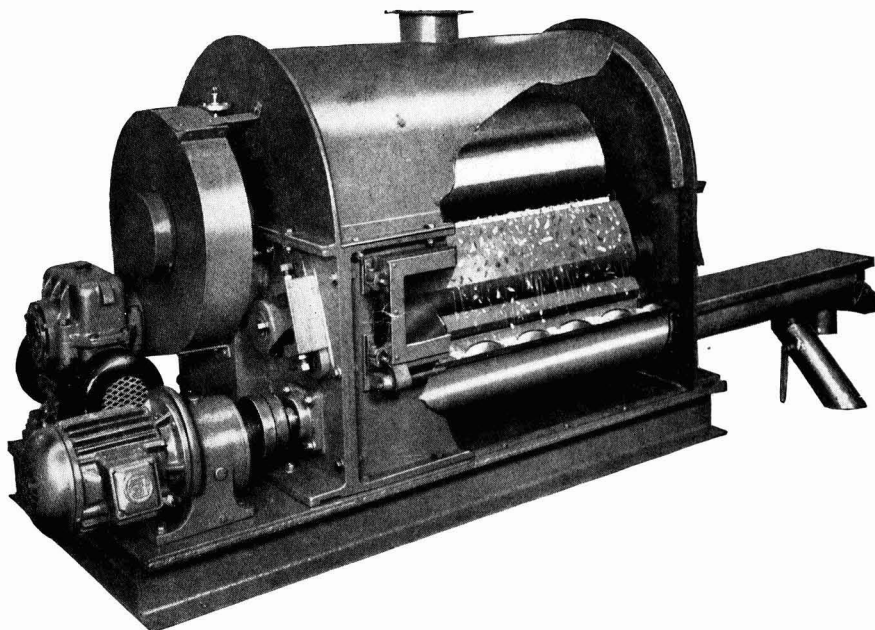
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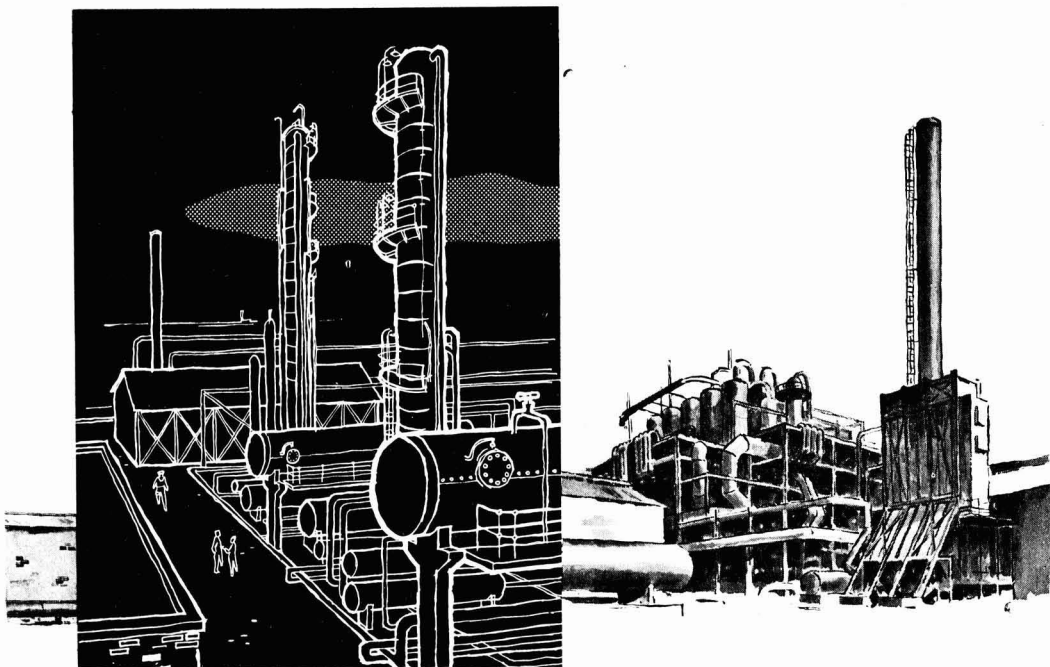
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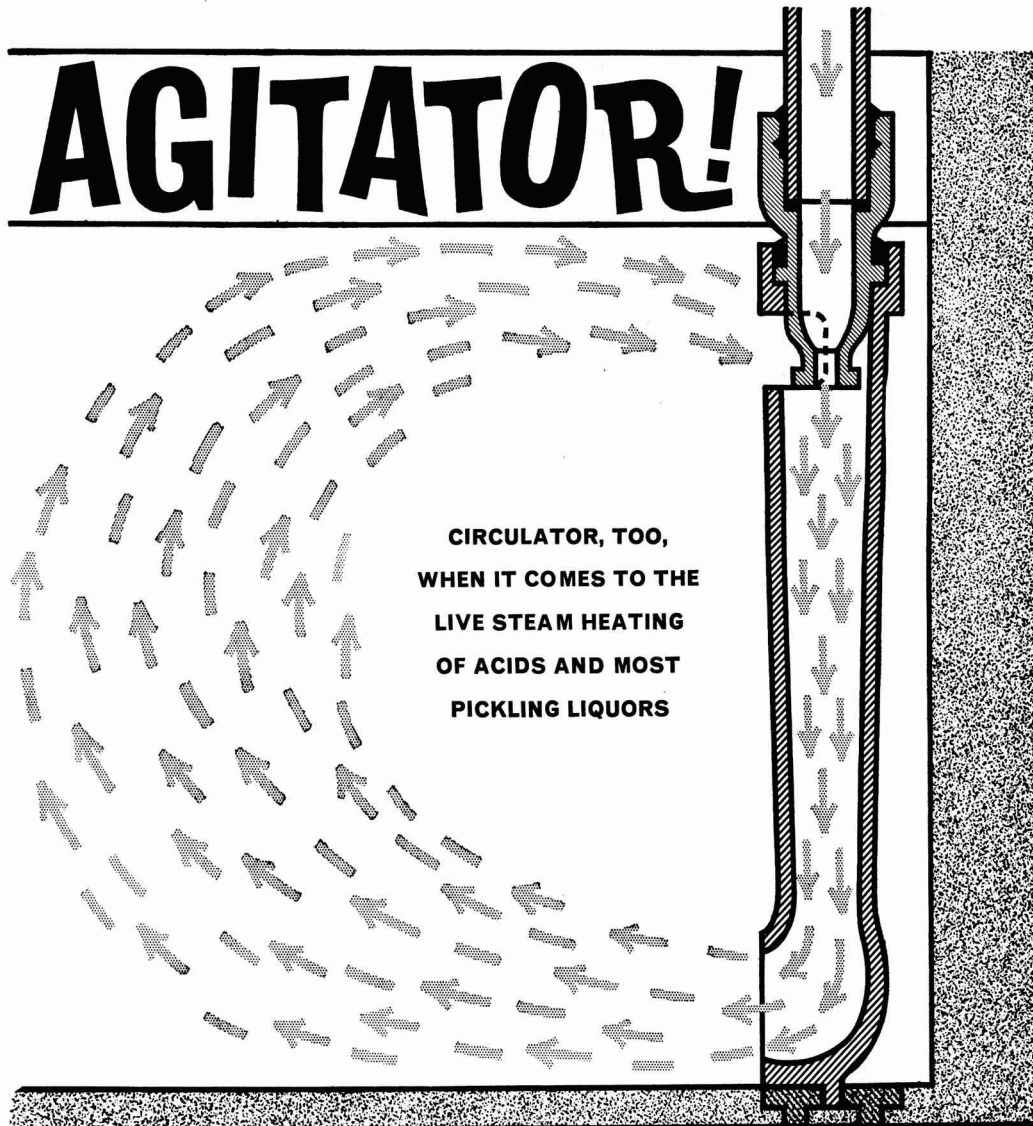
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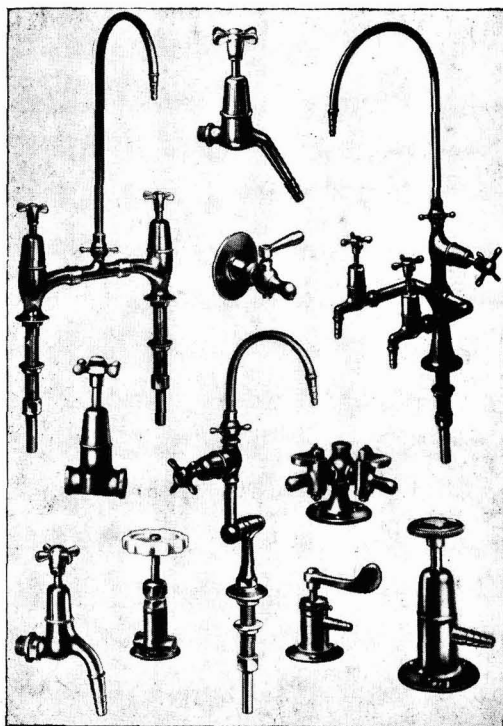
Back to the Steam Injector in particular — to give full details of this equipment's performance, which size of jet is called for by the task in hand, what the steam consumption would be, and so forth, requires more space than is available here. But that they are facts worth knowing will be quickly proved if you simply write and ask us for them. Our address is

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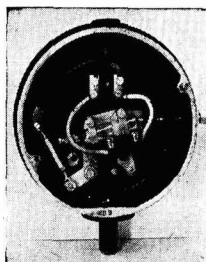
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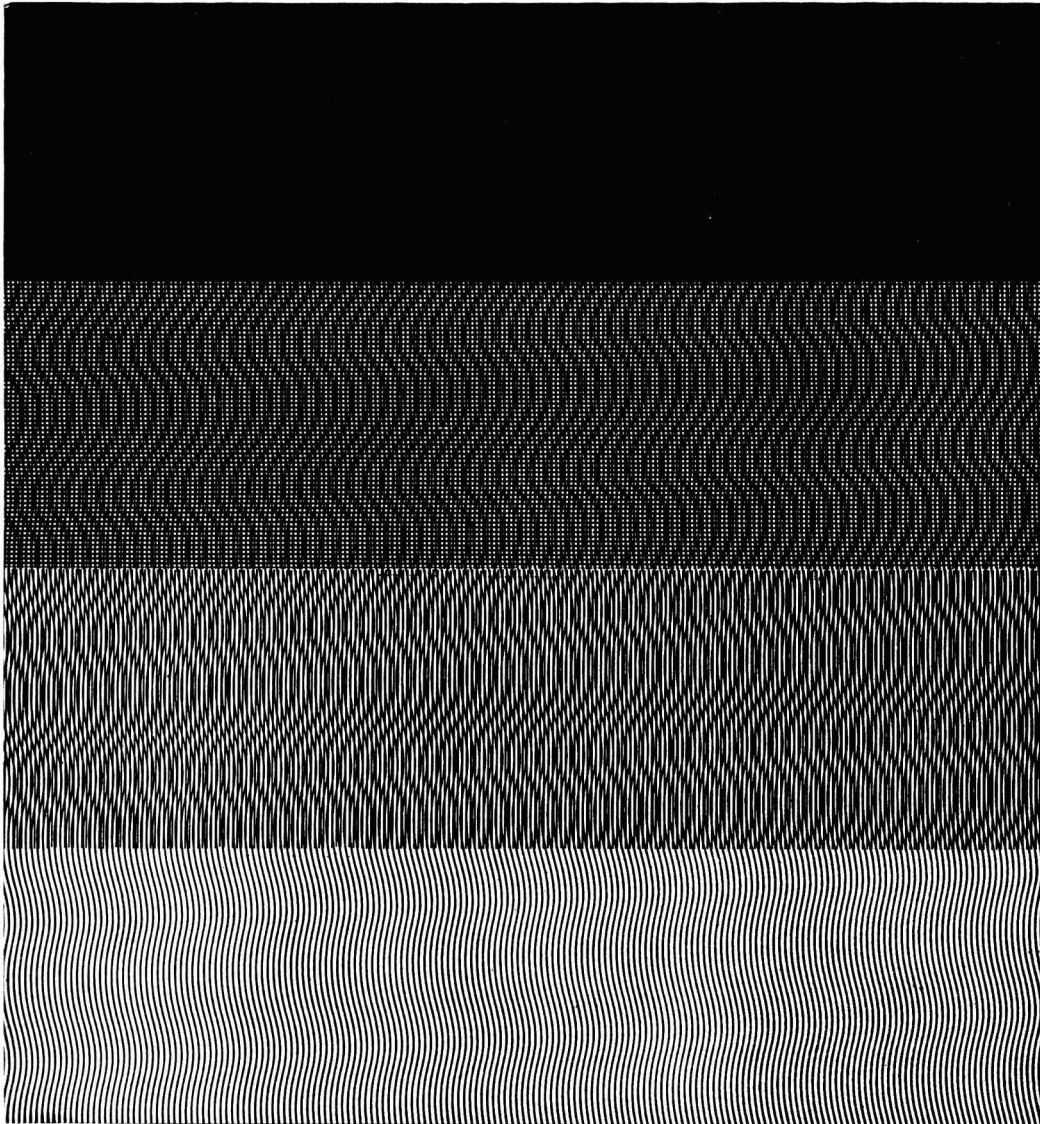
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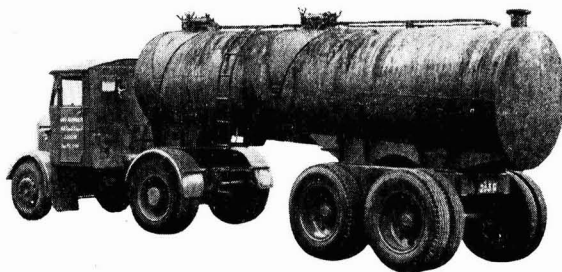


Illustration (by courtesy of James Hemphill Ltd.) shows 10-ton Road Tanker, lined with MAC-BOND Rubber to resist the action of phosphoric acid.

MacLellan Rubber

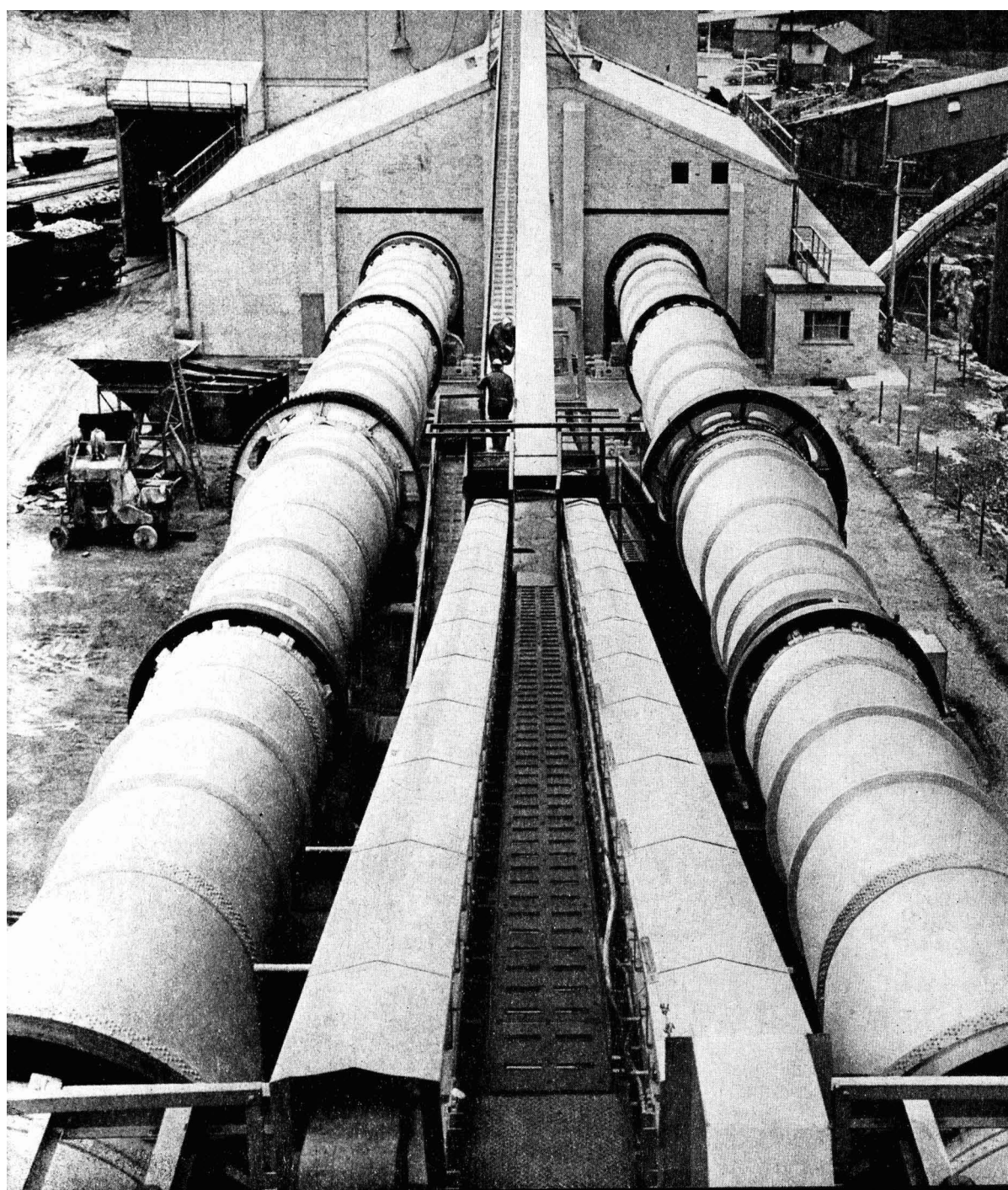


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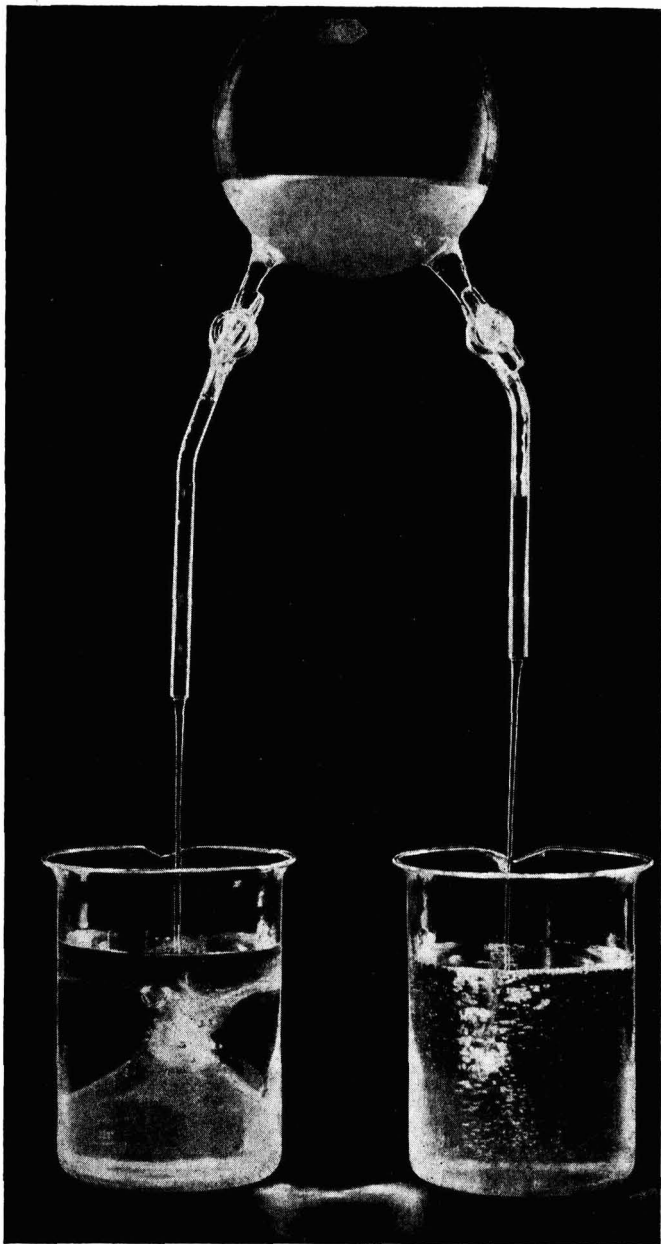
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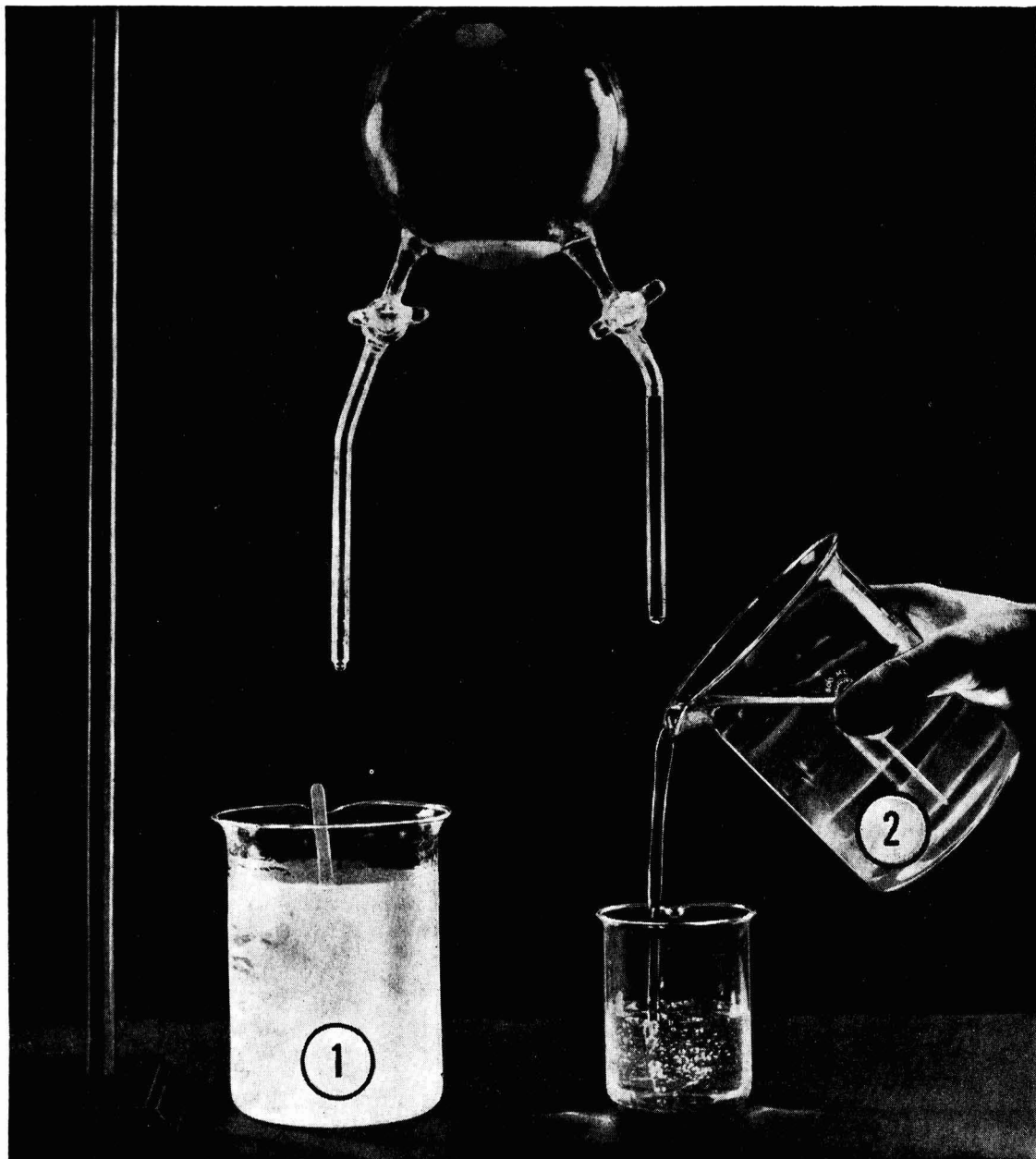
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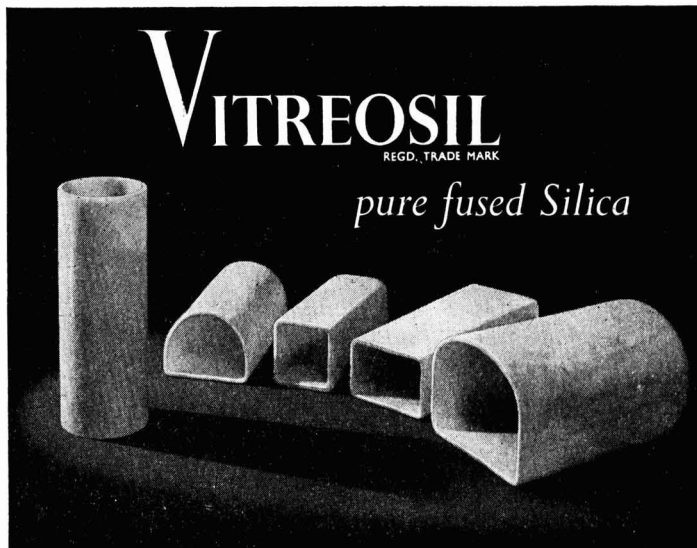
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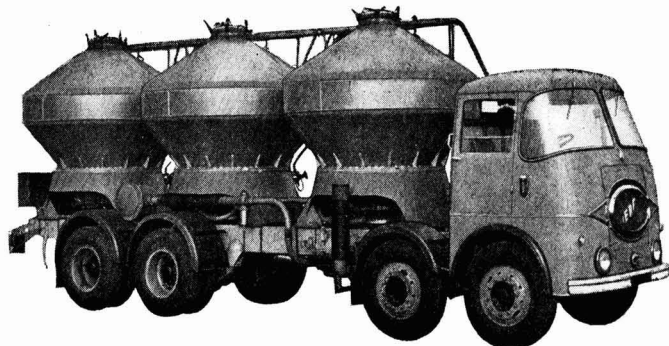
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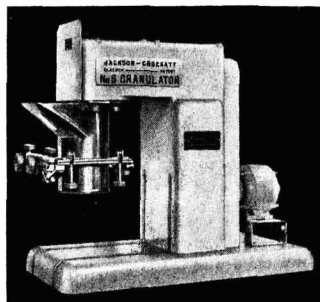
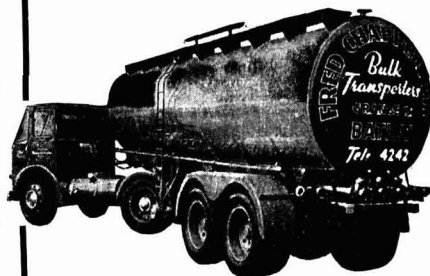
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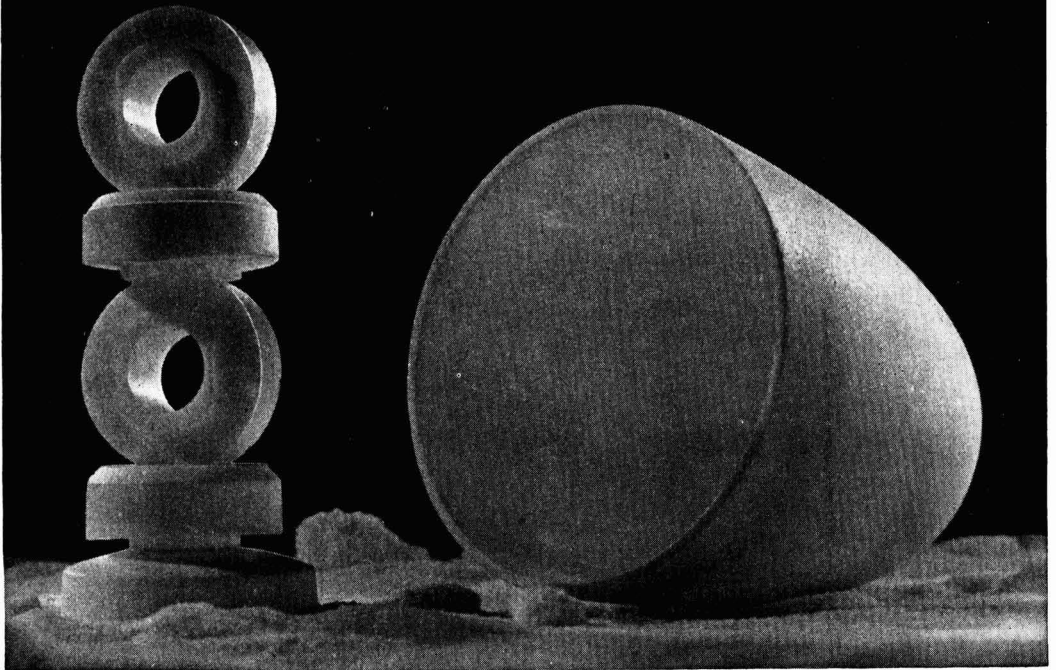
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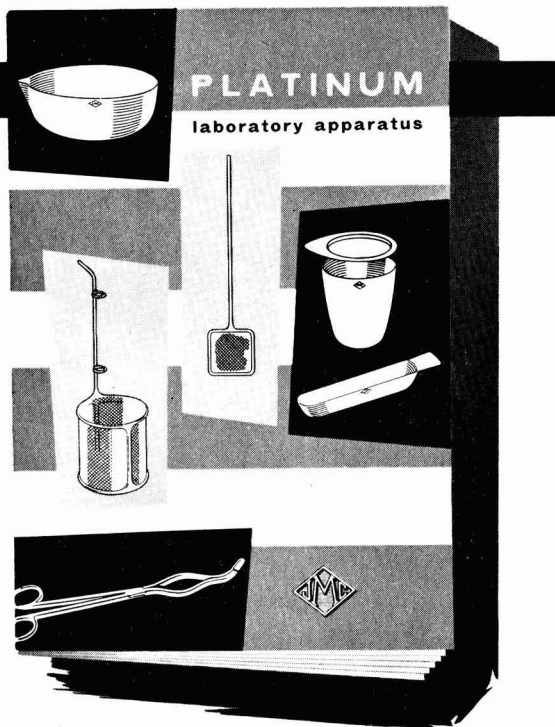


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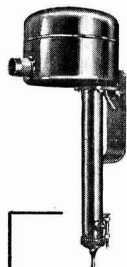
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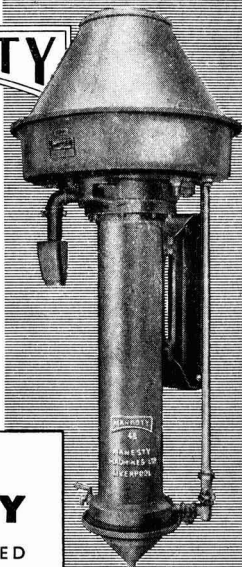
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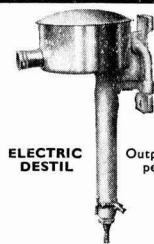
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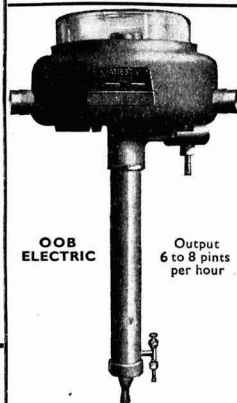
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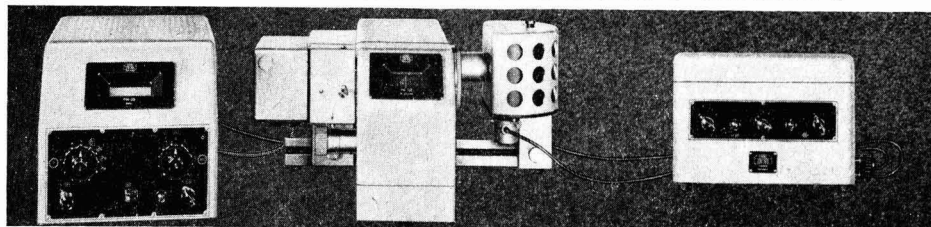


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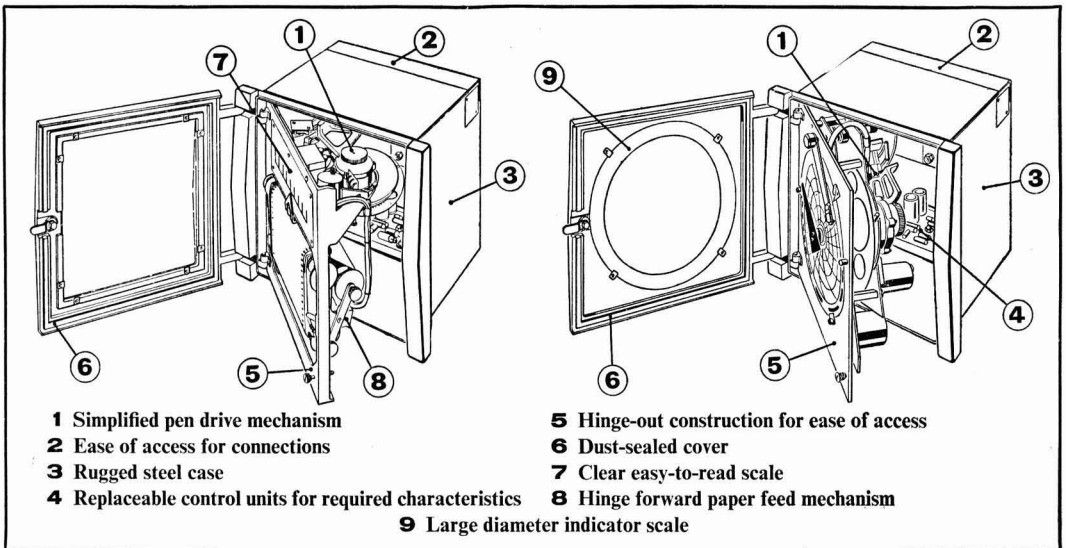
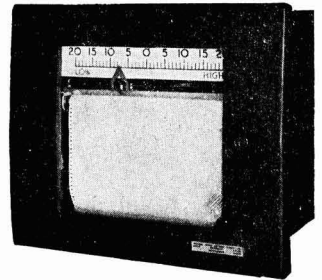
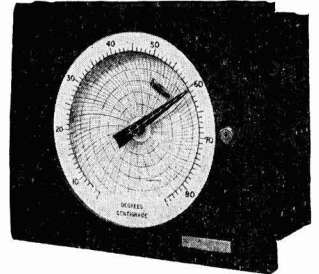


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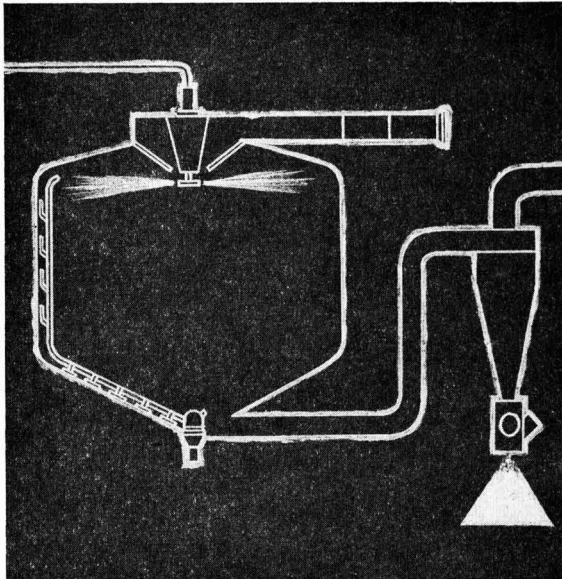
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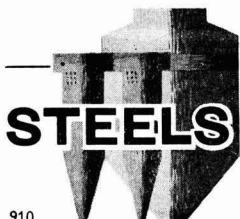
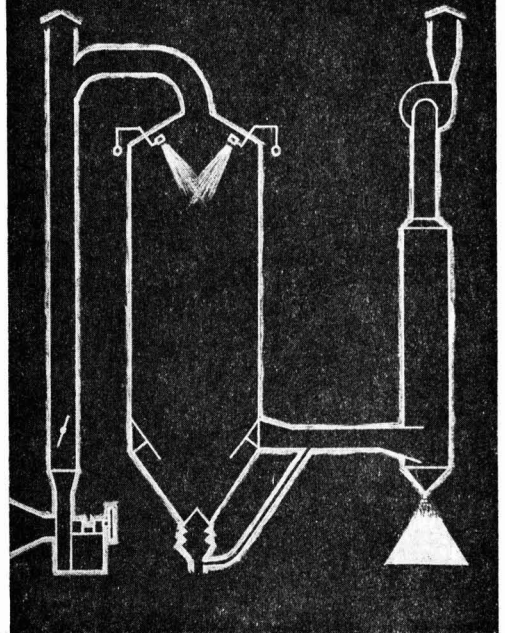


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UNDER-DEVELOPED AREAS

MANY areas of the world are under-developed and backward because they lack resources or, more often, the money or technical know-how to exploit the resources they have. It is to help overcome the latter of these problems that a conference on 'The application of science and technology for the benefit of the less developed areas' is being organised under the auspices of the United Nations.

The conference will be held in Geneva next year (the precise date has not yet been fixed but will probably be in May). Its purpose is to explore the recent advances in the application of science and technology which will benefit the less developed areas, to provide an opportunity for an assessment of the impact of such applications on the economic and social development, to reveal opportunities for research, and to stimulate and promote scientific and technological development in the less developed areas.

The general theme of the conference will be the challenging opportunities for accelerating economic development through the more effective application of existing science and technology and through research specifically designed to produce new applications of special interest to less developed countries. In the treatment of the theme special emphasis will be given to techniques of development which can lead to the optimal utilisation of the human, raw material, energy and capital resources, including the training of national personnel.

Included among the topics for sessions of the conference are agriculture, industrial development, and natural resources. Papers intended for inclusion in the industrial development session should clarify the basic essentials and the way in which weakness or strength in some of these essentials may affect prospects for particular industries. They should analyse the special factors conditioning industrial development in newly developing countries particularly the minimum size of plant in relation to economic factors, labour and capital intensity, management and labour skills and markets. Papers in the fertiliser section should deal with the scientific factors which determine the choice of fertiliser, the technical factors which determine the choice of raw materials, process product and location of plant, and the adaption of existing processes, or development of new processes, particularly suitable for developing countries. The session on heavy chemicals will deal with the role of heavy chemicals in industrial development, package plants for heavy chemicals, production of sulphuric acid from alternative sources of sulphur, development of the uses of chlorine at the various levels of production and natural sources of alkalis.

As the conference will avoid purely academic dissertations the papers must be of a general and comprehensive nature, and deal essentially with practical methods of application.

To avoid fruitless work on the part of authors, only brief summaries or notes explaining the titles proposed are required initially. From these, up to 50 British papers will be selected. All suggestions should be addressed to Sir William Slater, K.B.E., F.R.S. (U.N. Conference), Department of Scientific and Industrial Research, State House, High Holborn, London W.C.1.

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U.K. firms to import 30,000 t.p.a. of ammonia from Trinidad

PLANS are in hand by C. Tennant and Co. Ltd., in conjunction with British Hydrocarbon Chemicals Ltd., to import by 1964 30,000 tons a year of ammonia from Trinidad. This was stated by Mr. W. d'Leny, chairman of I.C.I. Billingham Division, at a recent meeting of the division council. Mr. d'Leny, who added that the division had been informed of the decision by Tennant, said that this ammonia would be produced from cheap natural gas in a plant owned by W. R. Grace of the U.S.

As stated in CHEMICAL AGE (17 February, 1962, p. 275) the possibility of importing ammonia from Trinidad is believed to have led to the abandonment of the Esso/Fisons ammonia project at Milford Haven.

Mr. d'Leny pointed out that the U.K. had no useful reserves of natural gas, or at least none had been discovered, although the oil companies, the Gas Council and I.C.I. had searched for more than 20 years. There had also been other smaller scale competition from imports from Italy, France, Germany, Canada and the U.S.—this would continue and perhaps increase.

Mr. d'Leny said that Shell were today producing nearly as much ammonia as I.C.I.'s Prodhoe and Dowlais Works together and were also importing from Holland the equivalent of one more external division factory. Despite that, their own sales were greater in tonnage in 1961 than in any previous year, although they would have been much greater still had Shell not been competing.

Billingham Division achieved its sales partly by cutting prices, and partly by increasing exports.

In addition to the Shell competition in ammonia, British Hydrocarbon Chemicals had commissioned last year a 60,000 tons/year plant methanol plant at Grangemouth, or about one-third of Billingham Division's capacity. This had happened at a time when the recession in the plastics industry had made methanol more difficult to sell. This new plant was bound to have important repercussions on I.C.I.'s own plants.

Ammonium sulphate

Mr. d'Leny then spoke about the current ammonium sulphate controversy. I.C.I.'s name had been the only name linked with it, but while Billingham Division were the major U.K. producers, other manufacturers were concerned, particularly the State gas and coal industries who sold at the same price as I.C.I. The domestic U.K. price was very similar to that in most other European countries, a little up or a little down, but not much in it.

The main item in the cost of sulphate was that of ammonia. Mr. d'Leny then spoke of the cost of raw materials for

ammonia and said that the division had spent nearly £500,000 on research work in an effort to develop a competitive process based on coal. But coal would have to be very much cheaper and oil very much dearer than at present, if coal was ever to win the battle over oil for chemical processing.

When the Billingham works was converted within the next 12 months its production of ammonium sulphate would be competitive with any of the world's production which was not sold at a dumped price.

The recent White Paper on Prices and Guarantees in Agriculture showed that in the last 12 months all the farmer's costs went up except the unit costs of seeds and fertilisers. In a period of steadily rising costs generally, that must surely be counted a fine achievement

and the simplest answer the division could give to its critics.

The new synthesis gas process, developed by the research and chemical engineering design of Billingham Division was going to have a fundamental effect on the division's ability to compete with any other producer in the world, except certain production based on natural gas. In countries where there were demands for natural gas for domestic heating, the price of the gas was such that the ammonia cost would be similar to those of I.C.I.

In countries not industrialised and where there were no other demands, natural gas was almost given away and the resulting ammonia was very cheap. Sometimes the plant sites had compensating disadvantages, such as lack of water, housing, transport and docks, and so far the really cheap producers were few.

This situation would have to be watched closely, because if the number increased considerably, they could have a very disturbing effect not only on I.C.I.'s business, but on the whole of international trade in nitrogen products.

Du Pont will shortly announce big new Dutch project in near future

DU PONT have very active plans in hand for further expansion of production facilities at Dordrecht, the Netherlands, and expect to announce one new project "of substantial scope in the very near future." This was stated by Mr. I. du Pont Copeland, a vice-president and director of E. I. du Pont de Nemours, at the opening of the Orlon acrylic fibre plant for Du Pont de Nemours (Nederland) N.V. The opening ceremony was performed by Prince Bernhard of the Netherlands.

Referring to the economic growth of the Common Market, Mr. Copeland said that Du Pont planned to make a major contribution to the area.

The following is a round-up of other Du Pont plants, either built, under construction or planned in Europe:

Belgium

In production with paint in 1959; capacity expanded 1960.

France

Fifty-fifty venture—Dekachimie—with Kuhlmann to make isocyanates by 1963; weedkillers produced under contract.

Germany

Pigment Chemie (24% Du Pont, 76% Sachtleben) will make TiO₂ by 1962.

Netherlands

Acrylic fibre production started 1961; unit to process Delrin acetal resin now due in production 1962.

Spain

Desarrollo Quimico Industrial (50-50 with Energia e Industrias Aragonesas) to make dithiocarbamate fungicides.

Sweden

Du Pont Nordiska will come on stream with paint plant in 1962.

U.K.

Neoprene plant on stream 1960.
Isocyanates plant planned for 1963.

Change of name for U.K. subsidiary of Grace

THE name of Dewey and Almy Ltd., Eleveneden Road, Park Royal, London N.W.10, has been changed to W. R. Grace Ltd. for reasons of company policy. At the same time the Dewey and Almy Division of W. R. Grace Ltd. has been formed to continue the production and supply of all those products which were produced by Dewey and Almy.

W. R. Grace Ltd. are currently constructing their first U.K. chemical facility. Sited in South Wales, at Baglan Bay, it will produce 8 million lb/year of polybutylene. Feedstock will come from the nearby facilities of British Hydrocarbon Chemicals and the process to be used is that of the W. R. Grace affiliate, Cosden Petroleum. Main contractors are Parsons Power-Gas Ltd., who aim to complete the contract by the end of this year. (See also CHEMICAL AGE, 4 November 1961, p. 713.)

£10m. construction programme at Wilton

THE construction programme at Wilton for this year totalled some £10 million of new work, a similar volume to the last few years, said Mr. J. C. H. McEntee, chairman of the Wilton Council, in a recent address to the Wilton Site Council. He said output from the plants was running generally at a high level, a reflection of the intensive efforts to expand their trade overseas.

Project News

Esso's second chemicals plant due on stream

NOW coming on stream at Fawley is the second petrochemicals plant of **Esso Petroleum Co. Ltd.**, which was completed late in 1961. This new £5.5 million plant, which had **Foster Wheeler Ltd.** as main contractors, will, it is stated, treble the present potential annual production of ethylene, which has been placed at 40,000 tons/year (CHEMICAL AGE, 11 March 1961, p. 407).

Capacity for butadiene (42,000 tons) will be considerably increased. A large proportion of the ethylene produced by the No. 2 steam cracker will be piped direct to the new ethylene oxide/glycol plant of **I.C.I. Heavy Organic Chemicals Division** at Severnside. The 78-mile long pipeline was built at a cost of £850,000 by **Constructors John Brown Ltd.**

Next major plant due on stream for Esso at Fawley is the 30,000 tons/year butyl rubber plant which has Foster Wheeler as main contractors.

Albright and Wilson's dialkyl phosphites plant

● AVAILABILITY of dialkyl phosphites from a new bulk plant under construction at Oldbury for **Albright and Wilson (Mfg) Ltd.**, London, will be announced by the company at the British Trade Fair, Stockholm (18 May-3 June), where they will be exhibiting. Organophosphorus compounds are widely used as intermediates in producing insecticides, drugs and other phosphorus compounds.

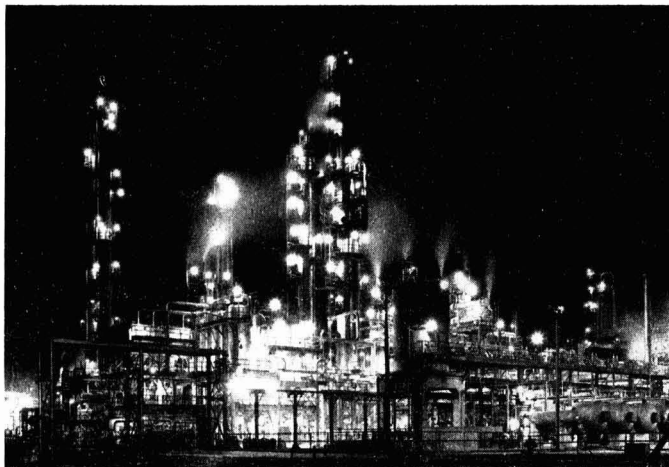
They will also announce at the fair a new range of Mellite p.v.c. stabilisers and will also feature Hetron thermosetting resins which retard flame and are used in many applications.

Good progress in Sturge overseas projects

● CURRENTLY Soc. Anonyme Sturge, the French subsidiary of **John and E. Sturge Ltd.**, Birmingham, are rehabilitating and expanding facilities for precipitated calcium carbonate at Montieres. The programme will bring the plant into line with Birmingham in its ability to meet the technical needs of traditional customers and enable it to advance into potential new markets for Sturge products.

S.p.A. Biacor have come into production at Casei Gerola, Northern Italy, with the production of citric acid by fermentation. In Northern India, Sturdia Chemicals Ltd. are erecting buildings and plant for the production of precipitated calcium carbonate at Rishikesh.

In the U.K., the three-year capital



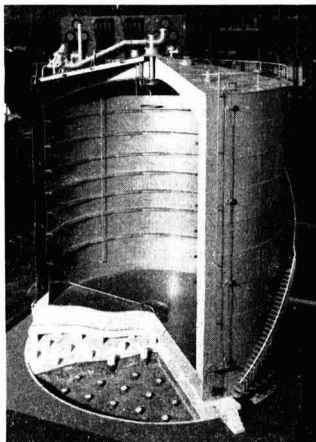
Night view of Esso's second petrochemicals plant, showing in the foreground fractionating towers and settling drums of the ethylene recovery section

spending programme is coming to an end and expenditure this year should be less than the 1961 total of £200,000 (see also 'Commercial news').

Equipment contracts

Whessoe gain big methane tankage order

● FOUR additional double skinned insulated storage tanks, with a total capacity of 16,000 tons of liquid methane are to be supplied by **Whessoe Ltd.**, Darlington, for the Canvey Island Terminal. The order, worth nearly £1 million, has been placed by the **North Thames Gas Board**, who are acting on behalf of the Gas Council and are carrying out the engineering works.



Cut-away model of the first double-skinned liquid methane storage tank built by Whessoe in 1959 at Canvey Island

Each of the four cryogenic tankage units has, in its welded inner aluminium alloy tanks, four times the capacity of the original liquid methane storage tank which was supplied and erected by Whessoe in 1959. Whessoe have gained considerable experience and knowledge from their pioneering work carried out on the first scheme at Canvey Island, as well as from their active participation in other projects for the cryogenic storage of liquid nitrogen, oxygen, propane, ethylene, carbon-dioxide and ammonia. Some of these projects are in themselves records of achievement in this field.

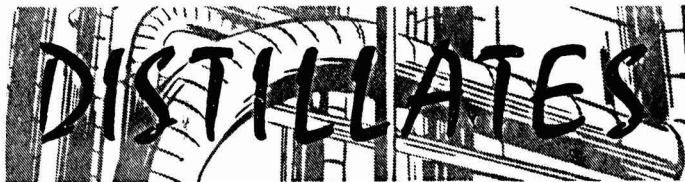
Butterfield's contract for liquid oxygen storage

● AN initial contract worth £33,500 from Azienda Torinese Ossigeno, Turin, producers of industrial gases, has been placed with **W. P. Butterfield (Engineers) Ltd.**, Shipley, Yorks, for eight cryogenic vessels to be used for storing and distributing liquid oxygen. Work on the order has started and shipment will begin at the end of June.

A.T.O. hope to buy a further 50 similar vessels over the next two or three years, as well as some smaller ones. Butterfields have an agreement with Ryan Industries Inc., Cleveland, Ohio, under which they have access to Ryan know-how, and have exclusive manufacturing and selling rights of Ryan-designed cryogenic equipment in the U.K., the Continent and West Africa. (See also 'Distillates'.)

Fall in U.K. usage of anti-knock compounds

U.K. consumption of lead alkyl anti-knock compounds in the first two months of 1962 totalled 3,581 tons, compared with 4,574 tons in the same period last year.



★ THE record levels of spending in the chemical industry last year, as indicated by the Board of Trade, were forecast by this journal in its survey of chemical plant last year. Then we suggested that the industry was spending between £280 million and £300 million, including plants completed in 1961, those then under construction, as well as projects sanctioned, but still in the design or engineering stage.

Actual spending last year topped £200 million for the first time. Some will say that the industry is happily ploughing more money into profitless over-production. But there is of course more to it than that. Much of this investment represents spending on products that are enjoying mounting demand; some of it is for chemicals not now made in the U.K.; some of it represents an investment in future demand.

Despite overcapacities, major British chemical producers cannot afford to stay out of certain fields. Not to build plants that require large-scale investment on the grounds that American, German or Japanese companies can supply British demand, would be a disastrous policy. As stated in our 'leader' last week, the question of timing is all-important—to get in too soon will prolong the period of uneconomic making; to delay too long would mean missing the 'cream' of the market.

Earlier the B.O.T. estimated that capital spending on chemicals this year would top the record 1961 level of £204 million. My estimate, for what it is worth, is that the final figure is likely to be between £180 million and £200 million, due to the rephasing of several large plants by a number of companies.

★ I.C.I. seem to be the favourite Aunt Sally of the politicians. Attacks have been made on their prices in both Lords and Commons recently and on one memorable occasion even the proverbial 'book' was thrown for good measure. On that occasion it was a copy of CHEMICAL AGE, which one M.P. said contained a picture showing I.C.I. staff "adopting a sycophantic attitude" to an East German Minister at the Leipzig Fair (see this journal 17 March).

Last week, that doughtiest of I.C.I.'s critics, Sir Cyril Osborne returned to his theme that it was I.C.I. who got the subsidy, not the poor old farmer, and he wanted the £4/ton tariff and £3/ton anti-dumping duty removed. Sir Keith Joseph, for the Board of Trade, had to remind him that it was common practice

for ammonium sulphate producers in many countries to sell at cheaper rates overseas in order to keep their plants running at economic levels and to make a contribution to overheads.

He also pointed out that two years ago, the Monopolies Report had said that the U.K. price was reasonable and that since then there had been two price cuts. Sir Keith thought the farmer was getting sulphate at only the economic price and was helped by the subsidy.

Mr. Douglas Jay had the last word. Amid laughter, he asked: "Is there anything I.C.I. could do of which the Government would disapprove?" (See also p. 680.)

★ SCIENCE teachers in those of our secondary modern and grammar schools handicapped by lack of modern equipment should appreciate the gesture of Mr. C. O. Stanley, chairman of the Pye Group, speaking at the opening recently of the new Cambridge scientific instrument centre jointly operated by W. G. Pye and Co. Ltd., and Unicam Instruments Ltd.

The centre, which, of course, develops and makes instruments covering a wide range of chemical and physical applications, will be open, at suitable times, to accredited U.K. science teachers wishing to examine, operate and learn about the latest products. Mr. Stanley said this might involve the laboratories being open after normal working hours, but they felt such 'homework,' with no commercial angle at all, might help teachers and pupils.

★ A GOOD example of Continental business hustle reaches me from the Industrial and Chemical Plant Division of W. P. Butterfield, the Shipley engineers. This company has recently secured an initial £33,500 contract from Italy for the supply of refrigerated storage vessels.

Mr. R. C. Russell, the division's sales manager, tells me that the contract was clinched after two executives of Azienda Torinese Ossigeno, liquid oxygen producers, accompanied by a friend who acted as interpreter, had driven the 893 miles from Turin to Shipley. They did this within 24 hours of cabling their intention of making the trip to Butterfields. After confirming the order, following a day of talks and inspections, they got into their Mercedes and drove back to Italy.

I gather that Butterfield's are giving top priority to cryogenic research and

manufacture because of "the tremendous potential, particularly in the Common Market."

★ FACED with an economic necessity to cut costs if fierce competition is to be met, it seems that no department of I.C.I. is likely to escape the axe.

One of the company's first economic decisions affects the publicity department. The *I.C.I. Magazine* will in the summer be published every two months, instead of monthly, and the price raised to 4d. The divisional newspapers are also to be increased in price and, while they will still appear at the same intervals, the number of pages will be reduced.

Although as a journalist I am loth to see any reduction in the printed word, this appears to be a sensible move for the company, for it will bring the need for economy home to all employees more effectively than all the pep talks or notice boards ever could.

★ BEHIND the selection for exhibition in the Safety, Health and Welfare Museum in London of a safe handling cabinet designed by Pandect Instrument Laboratories Ltd., High Wycombe, Bucks, is an interesting story.

About five years ago this company, faced with the problem of meeting, at a reasonable cost, regulations concerning possible injurious materials, produced the cabinet for their own use. The idea caught on, through personal recommendation and largely, the company believe, through factory inspectors passing on the word, with the result that Pandect have now supplied over 60 cabinets to other companies, both at home and abroad.

★ A NEW process developed by Badische Anilin- und Soda-Fabrik AG, Germany, permits the production of plastics components weighing up to several tons, state B.A.S.F. The process opens a whole new field of uses for the extra-hard and friction-resistant B.A.S.F. polyamide Ultramid, particularly in the machinery and plant-building industries. Examples given of the new possibilities are the production of rollers for the paper and textile and allied industries, large-scale machine components such as cogwheels and bearings, pulleys for cable railways and cable cranes, ships' screws and mixer propellers. Technical components produced from Ultramid by this process are to be shown at the coming German Industries Fair at Hanover. The process is explained in a lavishly-produced B.A.S.F. booklet available from Allied Colloids Ltd., Cleckheaton Road, Low Moor, Bradford, Yorks.

Alembic

In Parliament

Members of toxic substances advisory committee named

PERSONNEL of the Government's Advisory Committee on Poisonous Substances Used in Agriculture and Food Storage was given in a written answer in the House of Commons last week by the Minister of Agriculture. It is:

Chairman: Sir Charles Dodds, Courtauld Professor of Biochemistry in the University of London and director of the Courtauld Institute of Biochemistry, Middlesex Hospital.

Members: Mr. W. G. Alexander, Agricultural Research Council; Dr. H. R. Barnell, Chief Scientific Adviser (Food); Mr. R. S. Boote, The Nature Conservancy; Miss K. E. Boyes, B.O.T.; Mr. J. G. Carnochan, Animal Health Division; Professor A. R. Clapham, Dept. of Botany, Sheffield University; Dr. J. H. Gaddum, Agricultural Research Council Institute of Animal Physiology; Mr. F. H. Garner, principal, Royal Agricultural College, Cirencester; Dr. J. Hamence, public analyst and agricultural analyst; Mr. C. O. Harvey, D.S.I.R. Laboratory of the Government Chemist; Mr. G. O. Lace, Food Standards, Hygiene and Slaughterhouse Policy Division; Mr. A. LacLehose, Dept. of Health for Scotland; Mr. E. W. Momber, Office of the Minister for Science; Mr. W. C. Moore, Plant Pathology Laboratory; Dr. R. C. Norton, Medical Research Council; Mr. H. N. Roffey, M.O.H.; Dr. J. M. Ross, M.O.H.; Mr. L. J. Smith, Labour, Safety and Seeds Division; Mr. R. C. Tucker, Dept. of Agriculture and Fisheries for Scotland; Dr. E. E. Turtle, Infestation Control Laboratory; Professor Andrew Wilson, Professor of Pharmacology and General Therapeutics, Liverpool University.

Export f.o.b. prices for sulphate of ammonia

Sir Cyril Osborne asked at what price per ton f.o.b. sulphate of ammonia was exported to Mauritius (35,000 tons), Ceylon (46,000 tons) and Indonesia (54,000 tons) during the year ended June 1961. In reply, the Minister of State, B.O.T., Sir Keith Joseph, said that the exports to Mauritius and Ceylon were 34,000 tons and 64,000 tons, at average f.o.b. prices of £13 8s and £13 6s respectively, and exports to Indonesia were negligible.

Applications for anti-dumping duties

Eighteen applications for anti-dumping duties under the relevant Customs Act had been dealt with since April 1960, said the Minister of State, B.O.T., Sir K. Joseph, in the House of Commons last week. The applications included the following commodities, with results as stated:

Ammonium sulphate (Federal Republic of Germany and Belgium), voluntary action taken, April 1960; sodium chlorate, duty imposed, June 1960; ethanediol, rejected: no material injury, August 1960; vinyl acetate monomer, withdrawn by the applicants, December 1960; dodecyl benzene, rejected: no dumping, August 1961; ammonium sulphate (East Germany), duty imposed, March 1962.

Record capital spending in chemicals

ALTHOUGH for U.K. industry generally, fourth quarter 1961 fixed capital spending was down after seasonal adjustment, expenditure in the chemicals and allied industries, at £57 million was a quarterly record. Total spending in the chemicals and allied industries in 1961 was £204.3 million, a rise of nearly £50 million on 1960 and £7.3 million above the previous record year of 1958.

The following is an extract from tables published in the *Board of Trade Journal*, 13 April, p. 800:

| | In £ million | | | | Year |
|------|--------------|----------|----------|----------|-------|
| | 1st Qtr. | 2nd Qtr. | 3rd Qtr. | 4th Qtr. | |
| 1958 | ... | 48.7 | 48.4 | 46.3 | 197.0 |
| 1959 | ... | 44.5 | 42.7 | 33.9 | 164.2 |
| 1960 | ... | 37.5 | 37.1 | 38.3 | 156.7 |
| 1961 | ... | 44.7 | 50.5 | 52.1 | 204.3 |

Leuna chemical works develop boiler to produce power from salt coal

THE first stage of a pilot power station using brown coal with a high salt content has been developed by the Leuna chemical works of East Germany. The first experimental stage was completed at a cost of approximately £7,500,000.

The Leuna works use at present 20,000 tons of brown coal a day, but supplies in nearby Gieseltal will be worked out by 1975 to 1980. Vast reserves of so-called salt-coal, estimated at about 1,000 million tons, are, however, available in the Ammendorf area in the immediate vicinity of Leuna. Combustion of this type of coal for the production of power has hitherto proved unsatisfactory and uneconomical because the high salt content causes crusting on the boiler surfaces and reduces the life of the boilers.

Two standard types of boiler have now been developed by Leuna in which salt coal is now used. Total output of

the two boilers is 100 to 125 tons of steam an hour. Five boilers with a total output of 600 tons of steam an hour are planned.

The principle of the boiler operation is low pressure firing. Salt coal has a heating power of from 2,300 to 2,500 kcal. per kg. with an ash content that remains almost constant at 6 to 7%. The alkali content lowers the fusion point of the ash so that the crust is formed on an ordinary boiler. In the newly developed boilers at Leuna, the slag is drawn off in liquid form. By mixing the formerly volatile salt as completely as possible with the slag it is rendered harmless. The boilers are fitted with a ceramic lining to prevent damage from the molten slag.

As soon as the test boilers have proved satisfactory, the power station will turn over to the use of salt coal.

I.L.O. report on labour in chemicals

NO other branch of industry has advanced so swiftly as the chemical industries. Very conservative estimates put the value of their annual output throughout the world at considerably more than \$60,000 million. This is noted by the general report prepared for the Chemical Industries Committee of the International Labour Organisation. The Committee will hold its sixth session at Geneva from 7 to 18 May.

The U.S. still hold first place with some 37% of total output (39% for North America as a whole). The countries of Western Europe together account for one-quarter of the world's chemical output. The growth of the chemical industries has been specially marked in the last few years in the U.S.S.R. and other countries with planned economies. Their share of the world's chemical output already seems to have reached 23 or

24%. The remaining 12% covers Japan (5%) and the rest of the world.

The chemical industries require much more investment than the manpower industries, but the implementation of development programmes through the investment of very considerable sums is having advantageous effects on employment in industry as a whole. The steadily increasing complexity of techniques and appliances necessitates the employment of a highly trained labour force. Automation means that those who mind the apparatus and those who look after its upkeep must be technicians.

Although chemical industries on the whole use a small labour force in relation to the value of their output, some branches such as pharmaceuticals, natural and synthetic rubber and particularly industrial chemical products, still need large staffs.

'Industry selling' concept is basis of Monsanto marketing department reorganisation

THE current difficult and highly competitive period facing the chemical industry and the prospect of the U.K. joining the Common Market are reasons behind recent fundamental changes in



D. C. M. Salt

the structure of the marketing department of Monsanto Chemicals Ltd., London.

"The new organisation, designed to revitalise our marketing activities and strategy, is based on the broad concept of industry selling and product planning," their director of marketing, Mr. D. C. M. Salt, declared recently. Marketing operations, he said, would continue to be divided broadly between chemical and plastics products, but within them new product planning groups had been formed so that, in future, the planning function would be divorced from the selling. This special-

isation would enable the planning and selling groups to concentrate on their own particular tasks.

He said the importance of 'industry selling' on the chemical products side, where many of their products served several different industries, had been recognised in the new organisation. The old fine and heavy chemicals sales departments had been recast into two industry groups—one covering food and pharmaceuticals and the other surface coatings and synthetic resins. Each had its own internal sales staff and field force. Each could closely study how best to sell to and service the market requirements of its particular industries.

Illustrating what the change implied, Mr. Salt cited benzoic acid, all sales of which had previously been handled by the fine chemicals sales department. Now sales of it to the pharmaceutical industry would be handled by one sales group and those to the surface coating and synthetic resins industries by another. This method would achieve the specialisation essential for effective selling in world markets.

Mr. Salt said a market research group set up within the marketing department would report upon the potential for chemical and plastics products and would work closely with the respective product planning units. The final major change brought the publicity department within the orbit of marketing.

B.A.S.F.'s profit in 1961 pegged by difficult and competitive conditions

OVER last year the West German chemical company Badische Anilin- und Soda-Fabrik AG (B.A.S.F.), of Ludwigshafen-on-Rhine, had a turnover for the B.A.S.F. group (parent company plus subsidiaries) of DM 2,597 million or £230 million. This is only DM 9 million higher than that for 1960, rising quantitative sales and intensive rationalisation being faced with partly falling revenue; price pressure—particularly from U.S. plastics producers—caused a revenue loss of DM 130 million, and losses from the 5% revaluation of the mark in March, 1961, DM 50 million.

Net profit rose from DM 129,230,000 to DM 139,790,000 and depreciation from DM 203 million to DM 218 million over 1961, while taxes fell from DM 210 million to DM 176 million. Share of exports in total B.A.S.F. sales were unchanged at 37%.

Total investments are DM 446 million (415 million), of which about DM 30 million went to foreign holdings. Invest-

ment in research and development was some DM 40 million.

Some 30% of total turnover came from plastics and allied products, 14% from dispersions and solvents, 15% from other organic and inorganic products, 23% from nitrogen products and plant protection media and 18% from dyes-stuffs.

Of the subsidiaries, *Gewerkschaft Auguste Victoria* had a small profit, *Chemische Fabrik Holten GmbH* a loss, *Rheinische Olefinwerke GmbH*, of Wesseling, came up to full-capacity working, while other leading subsidiaries will give generally good dividends.

New acquisitions outside Germany were 50% in the capital of R. A. Cole Ltd., Bombay, India, and 49% in *Yuka Badische Co. Ltd.*, Yokkaichi, Japan, while in March 1962 the *Suma S.A.* concern was formed in France with a majority B.A.S.F. holding. The international sales organisation of B.A.S.F. was further extended last year.

Rise in output and use of syn. rubber

PRODUCTION of synthetic rubber in 1961, totalling 1,960,000 tons, increased by 73,000 tons, while consumption, at 1,890,000 tons was up by 110,000 in 1960. This is stated by the International Rubber Study Group. Production in January fell 12,500 to 177,000 tons, compared with December, while consumption rose 12,500 to 175,000 tons in January.

Production of natural rubber last year was up 140,000 to 2,105,000 tons. Consumption also increased during the year, by 100,000 to 2,085,000 tons.

U.K. fertiliser firms use Soviet phosphate

A MAJOR drive on the U.K. market for phosphate rock is being made by *Souius-promexport*, which handles exports of Kola phosphate rock. According to *Phosphorus and Potassium*, imports of Kola apatite concentrate may account for some 10% of Britain's total phosphate needs this year.

Already *Scottish Agricultural Industries Ltd.*, I.C.I. associates, have contracted to obtain the greater part of their phosphate rock requirements from Kola over the next few years, while *Marchon Products* are also said to have decided to take part of their requirements from Kola.

According to the U.S. Bureau of Mines (*Mineral Trade Notes*, April 1962, survey of the U.S.S.R.), Soviet exports of apatite concentrate in 1960 totalled 1,805,600 tonnes, compared with 1,660,700 tonnes in 1959. Shipments to the U.K. in 1960 totalled 5,500 tonnes (nil in 1959). Soviet production of apatite in 1960 was 4,300,000 tonnes.

Production, exports and imports of certain U.S.S.R. minerals in 1960 were as follows:

| Commodity | Output | In '000 tonnes | |
|--|---------|----------------|--------|
| | | Export | Import |
| Crude oil | 147,900 | 16,659 | — |
| Petrol products ... | 125,000 | 12,161 | — |
| Natural gas (calc. as coal fuel) | 54,400 | 280 | — |
| Mercury | 0.86 | 0.54 | — |
| Apatite* | 4,300 | 1,806 | — |
| Barite | 130 | — | 429 |
| Fluorspar | 190 | — | 75 |
| Phosphate rock ... | 2,300 | — | — |
| Potash salts (60% K ₂ O) | 1,800 | 629 | — |
| Pyrites | 2,000 | 410 | — |
| Sulphur | 370 | 64 | — |
| Talc | 20 | — | 83 |
| Salt | 7,500 | — | — |

* Exports of other phosphate materials include 203,200 tons of superphosphate and 121,400 'apatite ore'.

Bradford symposium on organometallic compounds

The Bradford Institute of Technology (dept. chem. technology) will hold a symposium on organometallic compounds on 18 and 19 May.

R.I.C. assistant secretary

Statutes of the Royal Society, Burlington House, London W.1, were amended by their council recently to provide for the designation 'Assistant Secretary' being replaced by the title 'Executive Secretary.'

Overseas News

Japanese work on naphtha-base production of ethylene, acetylene

RESEARCH into the production of ethylene and acetylene from petroleum naphtha feedstock has been successfully concluded by the Technical Research Association of Polymer Raw Materials of Japan. The Association has announced that industrialisation is assured.

The research carried out by the Association has aroused much interest because it was an entirely domestic enterprise; up to now, the Japanese petrochemical industry has been dependent upon techniques introduced from abroad. The research was supported both financially and with technical collaboration by 23 leading Japanese chemical, petroleum, and chemical and petroleum plant companies who set up the organisation for the purpose.

The Association was established in 1959, when a petroleum acetylene pilot plant with a capacity of 0.5 tonnes a day was set up. This was followed by an intermediate atmospheric plant with a capacity of 3 tonnes a day.

Kureha Chemical Industry and Toa Gosei Chemical Industry have already decided to industrialise the technique; enquiries from overseas manufacturers have also been received.

Shell erecting solvents plant in Melbourne

As part of their expansion plan, Shell Chemical (Australia) Pty. Ltd. are to erect a hydrocarbon solvents plant at Geelong, near Melbourne, to produce mainly for the Victorian, South Australian and Western Australian markets. Capacity will be approximately 25,000 tons/year in a wide range of aliphatic and aromatic solvents for paint, rubber, dry cleaning and other industries. It is expected at least 80% of the plant will be constructed with Australian materials.

There has been a hydrocarbon solvents plant at the Shell refinery at Clyde for some years and it will continue to produce for the New South Wales and Queensland markets.

Production figures of acetylene industry in Italy

Aggregate capacity of the 11 plants in Italy producing acetylene, totals about 220,000 tonnes/year, about 75% being accounted for by plants utilising methane and the rest by plants processing carbide.

The approximate tonne capacities of plants utilising methane are: Anic, at Ravenna, 60,000; Montecatini's, at Novara, 25,000; Sisas, at Limito, 30,000; Edison Chimica's at Porto Marghera,

20,000; Sicedison's at Porto Marghera, 20,000; Montecatini, at Rho, about 6,000; Montecatini at Bussi, 6,000.

Those of plants utilising carbide are: Polymer, at Terni, 20,000; Rhodiatoce, at Villadossola, 15,000; Solvic at Rosignano, 10,000; Sicedison's, at Porto Marghera, 10,000.

Anic, Montecatini, and Ceramiche Pozzi will build new acetylene-producing plants at Ferrandina, Southern Italy, and SIR are planning a unit at Solbiate, near Como.

Chemical units planned at Amsterdam refinery

NV Asphalt- en Chemische Fabrieken Smid en Hollander, who have just opened a 600 t.p.d.-throughput oil refinery in Amsterdam, are planning expansion of the refinery for the further processing of distillates. At present the main product of the Smid en Hollander refinery is asphalt.

Danubia Petrochemie delay full start-up of new polypropylene facilities

DATE for bringing into full operation the 5,000 t.p.a. polypropylene plant at Danubia Petrochemie AG at Schwechat, Austria, has now been put at 30 June next at the earliest. The plant, which started initial production after a delay late last summer, has thus not yet been handed over. Danubia are a joint subsidiary of Montecatini and the Austrian State concern Oesterreichische Stickstoffwerke. The Schwechat unit, last possible hand-over date for which was 30 March, is now producing between 200 and 300 tonnes per month, according to latest reports.

Phillips cut price of polybutadiene

Phillips Chemical Co., Bartlesville, have cut their price for polybutadiene by 2½ cents/lb. to 27½ cents U.S. delivered in carload lots.

New formaldehyde plant for French firm

Lambiotte Freres, S.A., 20 rue Dumont d'Urville, Paris 16, who are connected with Soc. Lambiotte et Cie., Brussels, are planning a new works at Niort, Deux-Sèvres, mainly for the manufacture of formaldehyde. Lambiotte Freres' product

Japan-Europe venture on sodium glutamate production in Switzerland

Kyowa Fermentation Industry Co. of Japan are stated to be negotiating with Nestlé of Switzerland regarding a joint venture for the production of some 300 tons/month of sodium glutamate in Switzerland, according to a recent issue of *Oil, Paint and Drug Reporter*. Ajinomoto, also of Japan, are said to be discussing the possibilities of a joint sodium glutamate venture with companies in France, Italy and the Netherlands.

Polysar to build butyl plant in Belgium

Polysar Belgium N.V., a subsidiary of Polymer Corp. of Canada, are to build a butyl rubber plant, with a capacity of 27,000 tons a year at a site near Antwerp. The plant is scheduled for completion in the latter half of 1963. Badger N.V., the Dutch affiliate of Badger Manufacturing Co., Cambridge, Mass., have been awarded the contract for detailed process design, engineering and procurement. The basic design is Polymer's.

German aid for Jordan fertiliser plant

A West German company is to provide assistance in the setting up of a £3.5 million fertiliser works at Alaqaba, Jordan. Construction is due to start in September and production is scheduled for 1965.

range includes amyl, ethyl, isobutyl, methyl and sodium acetate; acetic acid; butyric acid; propionic acid; charcoal; tar and creosote distilled from wood; formaldehyde; hexamethylene-tetramine; drugs; and textile and tanning auxiliaries.

Changes in Australian duty on nitrogen fertilisers

Changes made by the Australian Customs Board on duties for nitrogenous fertilisers are summarised in the *Board of Trade Journal*, 20 April, p. 873.

Pipeline system planned in India

The Indian Government has disclosed proposals to build a network of pipelines to carry crude oil to refinery sites and petroleum products to consumer points, in both eastern and western provinces of India. One pipeline is planned between Calcutta and New Delhi.

Soviet oil refinery for Cuba

In their agreement to sell Cuba, 20 complete factories for 300 million pesos, the Soviet Union will supply an oil refinery with a crude oil throughput of 2 million tons/year.

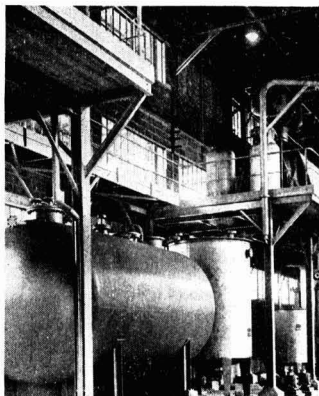
New French boric acid plant comes on stream

NEW plant of Seurobor at Pierre Benite, Rhone, began production in March. Seurobor (Société Européenne du Bore), a French company with a capital of NF.3,000,000; head office—10, Rue du General Foy, Paris, was formed in March 1961, by American Potash and Chemical Corp. of Los Angeles, and Société d'Electrochimie, d'Electro-Metallurgie et des Aciéries Electriques d'Ugine, of Paris. Its first objective is the production of 12,000 tonnes boric acid/year.

The plant has been installed in the important chemical complex to the south of Lyons. The Centre Technique de Lyon of Société d'Electrochimie, Ugine, were responsible for the technical studies and engineering of the plant which was completed in 14 months. The manufacturing process adopted by the parent companies is designed to ensure supply of a product with good free flowing properties even after prolonged storage.

Seurobor will supply a range of boric acid products with guaranteed chemical and physical specifications under the Three Elephant trade mark. Borax and

Chemicals Ltd., 35, Piccadilly, London W.1, European subsidiary of American Potash, are the selling agents.



Part of Seurobor's new plant

I.C.I. to close Middlewich soda ash plant

OWING to the change in pattern of the alkali trade brought about by increased production of electrolytic caustic soda, I.C.I. have decided to close the Middlewich soda ash plant towards the end of this year or at the beginning of 1963. The Middlewich plant accounts for less than 10% of I.C.I.'s total soda ash capacity in the U.K.

Alternative employment will be offered to as many as possible of the 250 employees.

Better trade in heavy organics

AFTER the worst period ever experienced by I.C.I.'s Heavy Organic Chemicals Division—the second half of 1961—business had improved in the first quarter of 1962. This was stated recently by Dr. S. W. Saunders, chairman of the division.

Difficulties arose from a fall in prices that had been expected, but which had been more rapid than had been anticipated. Dr. Saunders underlined the increasing need for improved efficiency and lower costs.

Costs in all departments of the division would have to be cut. That was not a matter of opinion or judgement; it arose from the cold hard economic facts.

E.E.L. to open new works in Essex

Mr. R. A. Butler, M.P., will open the newly completed works at Halsted, Essex, of Evans Electro Selenium Ltd., on Saturday, 5 May.

Proportionally packaged resins available in U.K.

DEVELOPED by Emerson and Cuming, U.S. producers of dielectric and microwave materials, a new method of bringing to consumers a precisely proportional measure of resin and curing agents in a glass container is available in the U.K. from the Electronics Division of Microcell Ltd., a subsidiary of BTR Industries Ltd.

This new packaging method is of special interest to circuit designers and production line technicians who may require small amounts of material. With a jar of resin and a vial of catalyst the exact mixture of components is ready to be blended and applied, and the resin jar serves as a mixing vessel.

Called Exacto Paks, the resin components are available in one-ounce and four-ounce kits. Prices range from 8s to 25s according to the quantity ordered.

Timborised timber-colour film available

SCREENED for the first time at a recent reception given in London by Borax Consolidated Ltd, a new 20 Mule Team colour film Timborised timber, shows how building timber can now be supplied protected throughout the cross-section against fungal decay and insect damage. Protection is achieved by impregnation of 'green' timber with Timbor, a highly soluble boron product marketed by the company. Copies are available on loan from the Timber Department, Borax Consolidated Ltd., Borax House, Carlisle Place, London S.W.1.

Nitrogen-methanol complex for Argentina

MONTECATINI Societa Generale, Milan, Italy, will play a significant role in construction of a \$26 million nitrogen-methanol complex near Zarate, Buenos Aires province, Argentina. It will produce annually 33,000 metric tons ammonia, 13,200 tons methanol, 36,200 tons formaldehyde (36%), 49,500 tons urea, 3,300 tons moulding powder and 3,300 tons urea adhesives.

Argentine participants are the combines Surinvest Iggam and Acindar. They will put up the capital for the new company, Petrosur. Montecatini will supply know-how, design and construction. On-stream date is mid-1965.

Freeze-dried BCG vaccine by Glaxo

It is estimated 500 million people have been vaccinated against tuberculosis—with no record of any mishap from its use during the past 30 years. This year, for the first time, the Ministry of Health is issuing only freeze-dried BCG (bacillus calmette-guerin) vaccine which has the advantage of remaining stable for at least 12 months.

Glaxo Laboratories are the only commercial producers of freeze-dried vaccine in Britain and sole suppliers to M.O.H.

Baker Platinum's new lab. equipment catalogue

THE Baker Platinum Division of Englehard Industries Ltd. has issued a new catalogue of their recently extended standard range of platinum laboratory equipment. The first two sections give a brief history, and some of the properties and uses of the precious metals, followed by sections dealing with the use and care of the equipment, the circumstances under which it may be chemically attacked, and suitable applications.

The next sections describe the full standard range of laboratory equipment, and some of the special products manufactured by the company. The final section comprises probably the most complete reference tables on platinum ever included in one publication.

First survey of CO₂ arc welding

THE first comprehensive survey in England of shielded arc welding techniques using carbon dioxide has been published by the British Welding Research Association, Abington Hall, Abington, Cambridge. Recent advances in the technique have made possible faster and better welds in mild steel.

As suppliers of carbon dioxide and its associated equipment for a number of industrial applications, the Distillers Company Ltd. have supported the B.W.R.A.'s development work, and have made available a number of complimentary copies of the new book.

LABORATORY EQUIPMENT REVIEW



'Chemical Age'
surveys new
developments in
equipment and
materials for
chemical research
and process
control laboratories



Further details of
the products referred
to in this survey
can be obtained from
The Manager,
'Chemical Age,'
154 Fleet Street,
London E.C.4.

THIS special CHEMICAL AGE survey reviews new developments and trends in laboratory apparatus, equipment and chemicals. Many of the developments mentioned here will be on show at the Laboratory Apparatus and Materials Exhibition, to be held this year in Harrogate from 14-18 May.

Predominant among the exhibits will be instruments to bring automation to the laboratory, freeing the scientist from the more tedious of his jobs, and enabling him to spend more time on productive work.

Low temperature drying

A new closed circuit low temperature drying unit is available from **A.E.W. Ltd.**, Imperial Works, High Street, Edgware, Middx. Tests carried out show that the drying time for plastic granules is reduced to approximately one-sixth of the time taken with a standard oven, and as far as the electrical industry is concerned the drying time is reduced from hours to minutes for small coils, transformers, etc.

Air control

A variety of equipment is supplied by **Air Control Installations Ltd.**, Victoria Road, Ruislip, Middx. This covers fans, air filtration equipment which includes everything from disposable filters to highly technical self-cleaning electronic precipitators, blowers, dust and fume control equipment, and air conditioners.

Process timer

An accurately timed switching facility for industrial control purposes is produced by **Airmec Ltd.**, High Wycombe, Bucks. No electrolytic capacitors are used and, apart from the heavy duty output relay, there are no moving parts to wear out. The unit is in consequence extremely reliable. Another process timer is to be shown by **Allied Electronics Ltd.**, 28 Upper Richmond Road, S.W.15, which is automatically reset, has ten step timing controls, and a zero warm-up period.

Also available from Airmec is a temperature control unit, type N241, designed for the accurate control of temperatures over a range of -80°C to $+500^{\circ}\text{C}$ with a high degree of accuracy. It may be used in the control of temperature in rooms, containers, ovens, platens, gases, etc. When the element is inserted in a stainless steel cover it may be used in liquids, corrosive atmospheres or conditions of high humidity.

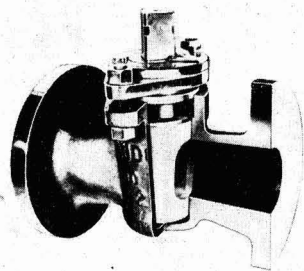
Bunsen burners

Amal Ltd., Holdford Road, Witton, Birmingham 6, have a wide range of bunsen burners for propane, butane,

methane and town gases. They vary in size from the Cadet for school use, to the Corporal for industrial and scientific laboratories.

Valve with p.t.f.e. sleeve

Of interest from **Audco Ltd.**, Newport, Shropshire, is a new valve with a p.t.f.e. sleeve. These are now available in sizes $\frac{1}{2}$ in. to 3 in. in cast iron, Audcoloy (an austenitic alloy cast iron



Unlubricated stainless steel Audco valve with p.t.f.e. sleeved plug

of the high nickel silicon type) and stainless steel for selective use on services which have previously been thought difficult to handle.

Also recently announced is a light duty gear unit which has been produced for use with certain wrench-operated Audco valves. The unit, which is maintenance free, has been designed to fit existing valves already in service, but it can also be supplied on a new valve.

Flame photometer

New from the **Baldwin Instrument Co. Ltd.**, Dartford, Kent, is a flame photometer for the rapid determination of calcium, potassium, sodium and lithium. As an analytical method, flame photometry has the advantages of simplicity of operation, versatility and the very short time required to obtain a result. Very little skill is required for operation and the apparatus requires only the minimum of maintenance.

New B.T.L. developments

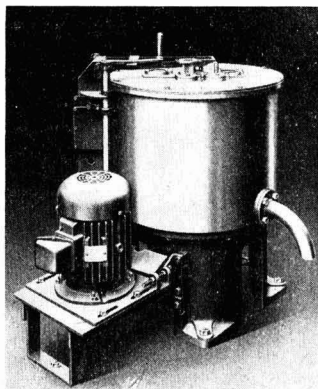
Developments in the instrument and apparatus field by **Baird and Tatlock (London) Ltd.**, Freshwater Road, Chadwell Heath, Essex, include the B.T.L. bench centrifuge, the B.T.L. adiabatic bomb calorimeter, the B.T.L. radioactive chromatogram scanner and the B.T.L. gas chromatograph for the Janak method. The bench centrifuge is enclosed in a cubic casing and is a complete departure from the 'cooking pot'

LABORATORY EQUIPMENT REVIEW

style. The trunions for swing out head are of two sizes and accommodate 4×50 ml. buckets and $4 \times (2 \times 15$ ml.) buckets. The buckets are designed to accommodate standard round bottomed tubes. The radioactive chromatogram scanner will accurately measure the distribution of radioactivity along paper strip chromatograms more rapidly than an instrument using only a single geiger counter.

Variable speed centrifuge

Thomas Broadbent and Sons Ltd., Central Ironworks, Huddersfield, state that the Broadbent 21 in. type 86 rigid bearing centrifuge is particularly suit-



21 in. diameter basket type 86 stainless steel centrifuge for small batch testing and for laboratory work, by Thomas Broadbent

able for laboratories and the treatment of high grade chemicals in small batches. It is available with a variable speed control, which can be set to any speed up to 1,700 r.p.m.

Drying ovens

Specially developed for testing the moisture content of manufactured tobacco, the sample testing drying oven produced by Barlow-Whitney Ltd., Coombe Road, London N.W.10, is also ideal for the moisture testing of other substances such as grain, barley and foodstuffs. Exact temperature control and uniformity are guaranteed features of this oven.

B.D.H.'s new chemicals

New biochemicals being manufactured by the Laboratory Chemicals Division of British Drug Houses Ltd., Poole, Dorset, include highly polymerised ribonucleic acid from yeast and a series of protected amino acids for peptide synthesis, e.g. N-acetyl-L-glutamic acid, benzyl-oxy-carbonyl and N-phthaloyl derivatives of glycine and DL- α -alanine. Also available is a new phosphorylating agent and an extensive

range of specially prepared materials for chromatography.

Bench service fittings

Among fittings available from Donald Brown (Brownall) Ltd., Lower Moss Lane, Chester Road, Manchester 15, are control valves for various bench services, which have been progressively developed over the years to give trouble-free service under laboratory conditions. They incorporate p.t.f.e. glands, stainless steel valve parts and surface hardened spindles.

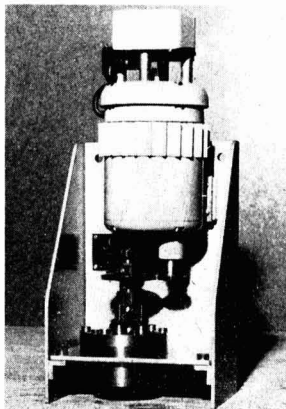
Digital microscope

Bryans Aeroequipment Ltd., 1 and 15 Willow Lane, Mitcham, Surrey, have developed a new digital microscope for measuring the length and direction of particle tracks in emulsion. Also of interest is a digital clock (20061), a small and reliable panel mounting instrument. Special features are that it requires no decoder, will give Greenwich time, local time or sidereal time, is observable on clock face or will record in decimal form on typewriter, line printer, teleprinter or card punch.

Also available from Bryans is a range of precision control and calibration equipment, including equipment from the Hass Instrument Corp., who are represented in the European market by Bryans. They cover very high precision measuring and control of pressures. The range of equipment includes barometers and manometers, pressure controllers, air data sheet sets, a digital pressure generator system and accessories.

Micrometering pumps

Two instruments, which are of particular interest to laboratories, are available from the Cambridge Instrument Co. Ltd., Cambridge. The microstep precision potentiometer has been developed for very high precision voltage measurement, and has the power of discrimina-



Cambridge micro-metering pump

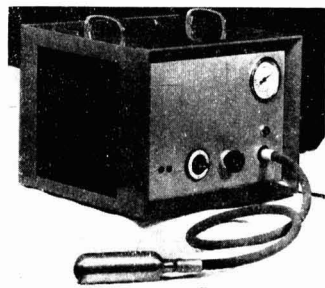
tion of one part in 20 million, and gives readings in steps of $0.1 \mu\text{V}$ up to 2 volts on a single range. Micrometering pumps produce accurately controlled and adjustable flow rates of the order of 0.1 ml. per min. and upwards according to the pump capacity of low viscosity liquids. The materials used in construction can be varied according to the properties of the liquid. Pumps of this type have many applications in work connected with research into and development of automatic analytical equipment.

Laray viscometer

The Laray viscometer, manufactured by Lhomargy in France, and available from Columbian International (Great Britain) Ltd., 116 Cannon Street, London E.C.4, will determine the viscosity of all kinds of liquid materials, particularly printing inks.

Becker balances

A range of Dutch Becker balances will be introduced to the U.K. in May by Camlab (Glass) Ltd., Cambridge. The range includes balances of various types



Camlab thermostatic fridge

including the Sitoptic which has an additional separate beam for preweighing operations. The main beam is reserved for the final precision weighing to one-tenth of a mg.

Pivotless instruments

Crompton Parkinson Ltd., Crompton House, Aldwych, London, W.C.2, have introduced a range of instruments called the Fiesta. These represent a new design in switchboard control instruments. A notable feature is that there is no pivot friction or pivot stick, and there is therefore no danger of damage through shock.

Standard units

Recently designed by Cygnet Joinery Ltd., Higher Swan Lane, Bolton, is a new range of standard laboratory units. Called 'T' type, the furniture is designed to meet modern contemporary styling, the main features being doors and drawers with recessed finger pulls and fume cupboard units which allow maximum all round visibility.

Air conditioning

A wide range of simulated atmospheric and humidity conditions for the laboratory can be attained and con-

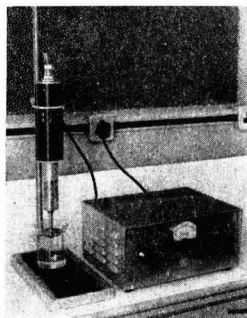
trolled by the packaged air conditioners available from **Carter Thermal Engineering Ltd.**, Redhill Road, Birmingham 25. These units are said to lead to a general increase in efficiency and a reduction in absenteeism and errors.

To keep costs down, Carter have designed their latest range of free standing air conditioning units in 'packaged' form. These are factory tested and need only connecting to electric and water supplies, thus cutting installation costs. That can also readily be moved.

All units are suitable for free or ducted delivery and can be heated by hot water, steam or electrical power, in addition to cooling facilities. Sizes range from 1½ to 15 h.p. The units, which have forward curved fan blades running at slow speeds for quiet operation, are made in glass-fibre.

Ultrasonic processor

The Soniprobe type 1130 is newly developed by **Dawe Instruments Ltd.**, Western Avenue, London W.3, and is an ultrasonic processor designed to provide high intensity acoustical power for



Dawe ultrasonic processor

scientific research and for processing in the medical and biological fields. It is a compact and safe source of intense ultrasonic energy which consists of a 20 kc/s transistorised generator and a sonic converter. This is ideal for extremely rapid tissue and cell disintegration and disruption, dispersal and homogenisation, bacterial activity stimulation or inhibition, the emulsification of immiscible liquids.

Coating unit

Edwards High Vacuum Ltd., Manor Royal, Crawley, Sussex, include in their range a Speedivac vacuum coating plant, model 12E8. This is designed to produce pure, thin metal films at very low pressures, and examples of evaporated chromium films produced in this equipment, together with data on the reversible resistance changes, are available from the company.

Panel meter

To meet the demand for a large-scale instrument with a modern appearance, **Electrical Instruments Ltd.**, Monstrose Avenue, Slough, Bucks, have introduced a new panel meter, the Taylor model 70. Special attention has been paid to the problems of panel area and, despite the

LABORATORY EQUIPMENT REVIEW

Quantovac spectrograph test room showing Carter air conditioner, which gives close control of temperature and humidity



long scale length, the meter movement housing has a diameter of only 3½ in.

Concentrating cell

Designed for concentrating small amounts of biological fluids, the Colover cell has recently been introduced by **Electrothermal Engineering Ltd.**, 270 Neville Road, London E.7. It will concentrate small amounts of biological fluids in such a manner that large molecular material, such as proteins, are held back in the concentrate, while water salts and substances of low molecular weight are diffused through a cellulose membrane. Also newly introduced is the micro-hotplate, which can be clamped to a retort stand in any position beneath a vessel to provide the required amount of heat.

Amino acid analyser

An entirely new piece of equipment is available from **Evans Electroelenium Ltd.**, St. Andrew's Works, Halstead, Essex. This is the EEL amino acid analyser specially designed to employ British components, and is the commercial model of the instrument developed by the research laboratories of Arthur Guinness, Son and Co. Samples containing 2 mg. of hydrolysed protein or from 0.1 to 3.0 micromoles of each amino acid can be analysed by this equipment with an accuracy of ±3%.

Double action pipette

New from **W. G. Flaig and Sons Ltd.**, Exelo Works, Margate Road, Broadstairs, Kent, is the Exelo double action pipette, which depends on the movement to and fro of the piston in the precision bore barrel under pressure of the liquid obtained from a reservoir placed above. It will carry out the work of every bulb pipette, graduated pipette and burette in use in the laboratory. The absence of a meniscus reading makes it possible for class A tolerance to be reached.

Photosedimentometer

For the speedy analysis of particle size, **Goring Kerr Ltd.**, Station Road, Gerrards Cross, Bucks, have made available for the first time for general sale a photosedimentometer, specially developed for use with sub-sieve powders. Examples of powders which can be

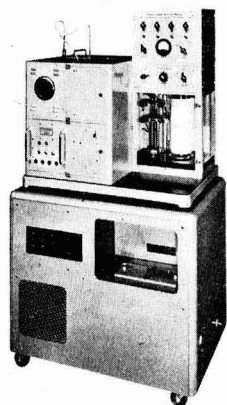
analysed are metallic powders, ceramic powders, silica, carbon, minerals, abrasives and foodstuffs.

Filter papers

J. Barcham Green Ltd., Hayle Mill, Maidstone, Kent, have discovered a new way to make filter papers which are rapid and also have a good wet strength. Three of these are unique and completely new—the 940 for coffee and soft drinks, the 960 for sticky liquids such as varnishes and thick oils, and the 993 which has a high wet strength and can be used for filtering large quantities of liquid at a time without fear of bursting the paper.

Distillation apparatus

An automatic standard distillation apparatus is a development of **A. Gallenkamp and Co. Ltd.**, Technico House, Sun Street, London E.C.2. This instrument incorporates controls which render it very versatile, and accessories such as refrigerator dry point detector and temperature range adaptor are available. Other features are the electronic tem-



Automatic distillation apparatus

perature recorder, timed auto-thermostats controlling the condenser bath and alternative devices for ending the test according to the method chosen.

LABORATORY EQUIPMENT REVIEW

G. & G. chromatograph

Newest among the range of laboratory equipment produced by **Griffin and George (Sales) Ltd.**, Ealing Road, Alper-ton, Wembley, Middx., is the D6 gas density balance chromatograph. The D6 is a fully integrated and engineered system of gas chromatography. It incorporates the Martin gas density balance which is a precision made detector for measuring any organic or inorganic gas or vapour. The balance is insensitive to any variations to carrier gas flow and, since its response is to a density function alone, calibration is unnecessary for a sample of known molecular weight.

Also new from Griffin and George is the Griffin oscillating hotplate. The hotplate is designed to perform the action of heating and agitation simultaneously, and accommodates up to 28 x 250 ml. beakers. The hotplate rating is 2,000 watts at 240 volts and a surface temperature of 650°C can be achieved.

New chemicals

Additions to the range of laboratory reagents produced by **Hopkin and Williams Ltd.**, Freshwater Road, Chadwell Heath, Essex, are o-dianisidinetetraacetic acid complexometric indicator with fluorescent endpoint, syn-phenyl 2-pyridyl ketoxime colorimetric agent for iron, 4-(2-pyridylazo)-resorcinol colorimetric agent for cobalt, lead and uranium, and 9-(4-dimethylaminophenyl)-2, 3, 7-trihydroxy-6-fluorone spectrophotometric reagent for tantalum.

Fluorimeter

A feature of the **Hilger and Watts Ltd.** range (98 St. Pancras Way, London N.W.1) is the fluorimeter II 960, designed to measure fluorescent emission of samples and to indicate their relative value on a scale. Features include rapid sample-cell change and loading, automatic shutter for zero balance, continuous variation of sensitivity and a backing-off circuit for dark-current balance. This model uses, as standard, Spekker fluorimetry 6-ml. glass cells; low capacity 2-ml. cells can also be used.

An important advance by Hilger and Watts is their development of a computer for the Polyvac direct-reading spec-

trograph, enabling its electric typewriter to print spectroanalytical results in percentage concentration. The Polyvac determines C, P, S, Mn, Si and up to 14 other elements in low- and high-alloy steels and cast iron. The analysis is fully automatic, giving results in less than three minutes. As many as 400 samples can be analysed in a three-shift day; simple steels take 75 seconds.

Laboratory chemicals

The range of laboratory chemicals available from **Howard Lloyd and Co. Ltd.**, Clerk Green, Batley, Yorks, includes 2-furoic acid, technical; allyl- and ethylfuroate redistilled pure; isopropyl- and methyl-furoate redistilled pure; furfuryl mercaptan; phenyl nicotinate (technical and recrystallised); carbazole pure; sulphobromophthalein sodium USP; phenol tetrabromophthalein inductor.

Accurate thermometer

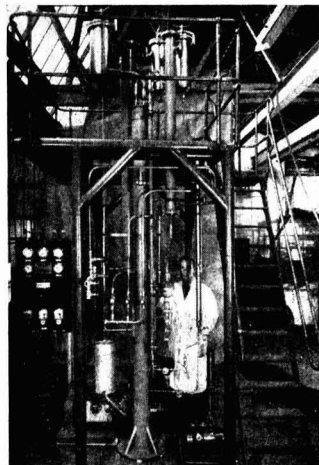
An extremely accurate pocket laboratory thermometer constructed of stainless steel (Rueger equipment) is available from **James Hugh Instruments Ltd.**, 7 Melrose Avenue, London N.W.2.

Heating mantles

Isopad Ltd., Boreham Wood, Herts, state that their high temperature laboratory oven with fully automatic control is now available in two ranges—up to 500°C and up to 800°C. The stainless steel cavity measures 16 in. by 16 in. by 12 in. deep. The special Isomantle for use in flameproof areas is now available in laboratory sizes. The multisize design, allowing use of one heating mantle for several flask sizes is offered in sizes from the smallest micro-mantle up to 20 litre.

Strip chart recorder

One of the latest additions to the Mark 3 series of electronic strip-chart recorders produced by **George Kent Ltd.**, Biscot Road Works, Luton, Beds, is the 36-range recorder specially developed for use in research and development laboratories. It gives an easy selection of any one of the 36 ranges in one instrument by the simple adjustment of two switches.



Kestner laboratory single-effect multi-circulation evaporator

Evaporators

Recently added to the range of equipment from **Kestner Evaporator and Engineering Co. Ltd.**, 5 Grosvenor Gardens, S.W.1, are two evaporators. One is of the climbing film type and is provided with multi-stage heaters for pre-heating the incoming feed liquor. The design is such that the whole of the water evaporated is recovered and can be measured. The other is of the multi-circulation type, and is a pilot size for use in research laboratories. It operates under relatively high vacuum and is ideal for the concentration of a very wide range of heat sensitive products for which it is essential to have both a short time of contact and low temperature. The model shown is fitted with Kestner's ester recovery system; capacity of this model is 70 lb/hour of water evaporated.

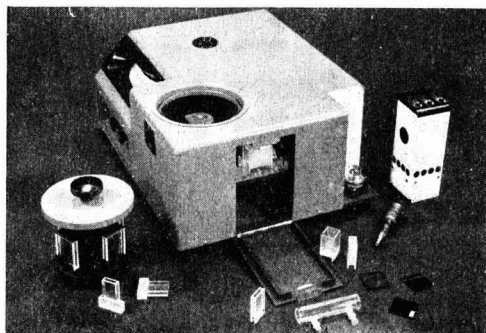
New counters

Of interest to chemists working with radiochemical techniques are two new counters by **Labgear Ltd.**, Cromwell Road, Cambridge. The decade-counter D.4.51 and the counting-rate meter D.4.52 with their associated G.M. probe unit offer all the basic facilities for G.M. counting.

Multiple distillation unit

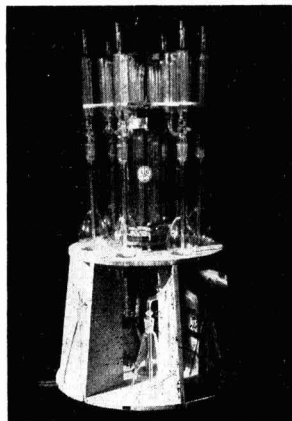
Among recently introduced products of the **Loughborough Glass Co. Ltd.**, Loughborough, Leics, is a multiple distillation unit, designed mainly for Kjeldahl distillations for nitrogen determination. A great saving in space and setting-up time is claimed. An asbestos board structure supports six Kjeldahl flasks over a candelabrum of Meker burners, each with its own tap. A distillation head at the top of each flask feeds into a common condenser unit with six separate condenser tubes. The outlets from the condenser tubes feed through glass tubing with hemispherical joints into conical flasks (capacity 500 ml.) which stand beneath the corresponding distillation flasks.

Also new is the Loughborough Safe-



Hilger and Watts H960 fluorimeter with turntable cell holder, cells, etc.

LABORATORY EQUIPMENT REVIEW

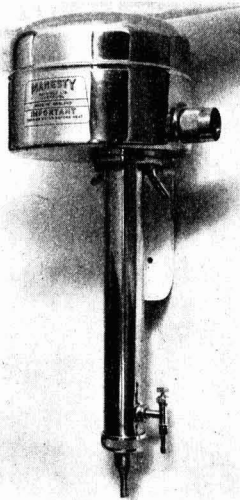


Loughborough Glass multiple distillation unit

guard, an acrylic safety screen which can be stood in front of assemblies to give protection through a horizontal arc of 180° or more.

Stainless steel still

Made entirely in stainless steel, **Manesty Machines Ltd.**, Evans Road, Liverpool 24, have recently introduced the S30 automatic water still. This model, fitted with a 3,000 watt element, can



Manesty S.30 stainless steel automatic water still

give 6 to 8 pints of high quality distilled water per hour, or 3 to 4 pints/hour with a 1,500 watt element. Boiling chamber, lid, baffle, inner baffle, condensing pipe, condensing tube and nozzle are all made of stainless steel.

High temperature furnace

A recent development of **Metals Research Ltd.**, 91 King Street, Cambridge, is their 1,800°C Pyrocore, an 18 in. long low cost heating element with an impervious alumina sheath,

wound with molybdenum wire and placed in a second sheath of the same material. This is water-cooled and can reach a temperature of 1,800°C in only 2½ hours.

New volumetric solutions

May and Baker Ltd., Dagenham, Essex, offer a new range of standard volumetric solutions. Known as Volusol solutions, they are accurately standardised and ready for immediate use. They are available in 2½ litre glass bottles, except for standard alkalis, which are marketed in 4½ l. non-returnable plastics containers. Volucon standard volumetric concentrates (solutions of 15 commonly used laboratory chemicals) have been introduced in plastics ampoules of 1-litre capacity. Each Volucon pack contains six ampoules, one plastics funnel, one piercing rod and six labels.



Volucon volumetric concentrates supplied in plastics ampoules by May and Baker

Dry powder extinguishers

Nu-swift International Ltd., Elland, Yorks, have a new 15 lb. dry powder extinguisher designed for use on inflammable liquid fires, as well as fires involving live electrical equipment, the discharge from the extinguisher being non-conductive. It is claimed that in the hands of an experienced fire fighter it can extinguish 120 sq. ft. of an inflammable liquid fire.

Moisture meter

To be introduced by the **Northern Media Supply Co.**, 11, 12 Blanket Row,

Hull, is a high temperature moisture meter for moisture estimations from 0-100% with an accuracy of ±.05%, using a variable infra-red heat source capable of a maximum temperature of 600°C. This is a newcomer to a well-established range of Gallia moisture meters for operation up to 130°C. The FlexiRing label system has been greatly increased with additional titles. Also introduced in Flexilene is a new range of light and heavy duty gloves.

Safe handling cabinet

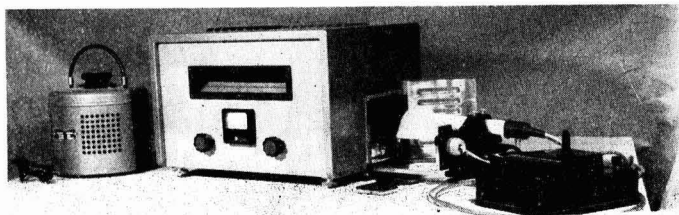
First of its type to be designed in the U.K., a new, multi-purpose, totally enclosed, safe handling cabinet is shortly to be available to laboratories and industry. Built to allow the use in confined areas of materials likely to affect health, the cabinet has been adequately proved during five years of service with its manufacturers **Pandect Instrument Laboratories Ltd.**, Wellington Road, High Wycombe, Bucks. Small modifications now make it suitable as an assembly cell for parts requiring a dust-free atmosphere.

Designed to meet Ministry of Health requirements for the handling and application of radioactive compounds, the cabinet is suitable for a wide range. Generally speaking, the company states, quantities of most toxics, irritants, contaminants, corrosives and other potentially injurious materials can be handled with complete confidence and safety.

Some years ago Pandect produced the cabinet for themselves in connection with the luminising of instrument dials. Since then, entirely on recommendation, other manufacturers have ordered more than 60, 10 of them for overseas.

Three spectrophotometers

Perkin-Elmer Ltd., Beaconsfield, Bucks, now have available three infra-red spectrophotometers of which model 125, a high performance i.r. grating instrument, is the first commercially available infra-red instrument which scans the frequency range from 10,000 to 400 cm⁻¹ (1-25μ) completely automatically. Models 237 (grating) and 137 (prism) have simplified controls and are particularly suitable for general chemical use. The latest advances in gas chromatography are incorporated in model 451 fractometer. This has a modular design so that



High temperature moisture meter from Northern Media Supply

LABORATORY EQUIPMENT REVIEW

the most efficient combination of sampling device, column and detector can be chosen for each individual problem.

Model 184 process fractometer applies gas chromatography to precise analysis on an automatic basis. The sensing unit is explosion proof and may be installed in hazardous areas. A new particularly versatile programming unit allows a number of streams or components to be monitored in succession, and can incorporate memory units to give continuous trend outputs for direct control.

Nylon tubing

Nylon tubing for use in gas chromatography is the latest development by **Portland Plastics Ltd.**, 197 Knightsbridge, London S.W.7, in sizes ranging from .010 in. to .040 in. This Maranyl nylon tubing can be supplied in any required length up to 1,000 ft. Also available is general purpose tubing in p.v.c., vinyl and polythene, with a range of nylon connectors and adaptors.

Cinemicroscope

A self-contained transportable Cinemicroscope for recording by continuous or by time lapse 16 mm cinephotography movement in any type of microscopical specimen is made by **W. R. Prior and Co. Ltd.**, London Road, Bishop's Stortford, Herts. The microscope is fitted with parfocal photographic and observation eyepiece and is mounted on a vertical optical bench.

Chromatographic equipment

Shandon Scientific Co. Ltd., 6 Cromwell Place, London S.W.7, have two new chromatographs, the FB-4 ionisation chromatograph and the KG-2 thermocell chromatograph. The first is designed for advanced research on gases, hydrocarbons, fatty acids, steroids, halogenated pesticides, etc., and the latter for the more routine applications in the works laboratory. Also new is the Shandon Unikit teaching level chromatography and electrophoresis apparatus for schools.

Pye developments

Among new equipment by **W. G. Pye and Co. Ltd.**, York Street, P.O. Box 60, Cambridge, is an immersion-type pH

electrode assembly. This is constructed basically of stainless steel and can be coated with nylon or other plastic materials for special applications. Several unique features are embodied in the design which enable satisfactory electrode operation to be maintained under the most vigorous industrial conditions, and include a built-in head of KCl to the reference electrode and quick release handle.

Also of interest are a new automatic coulometric titrator, a new potentiometric pH meter, and a new portable electronic megohmmeter covering very high resistance measurement in seven ranges.

Multi-purpose machine

A machine which will mix, emulsify, homogenise, gel, suspend and disintegrate solid animal vegetable and

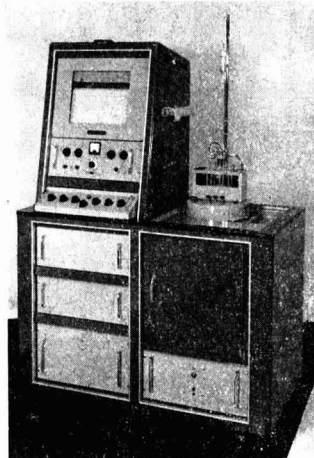


Emulsifier
by
Silverson

mineral matter, has been developed by **Silverson Machines Ltd.**, 55-57 Tower Bridge Road, London, S.E.1. It differs from ordinary stirrers and agitators in that it has a positive mixing action which is divided into three stages, and carries out its operations without incorporating air.

Cathode-ray polarograph

Southern Analytical Ltd., Frimley Road, Camberley, Surrey, have the A1655 Southern-Harwell pulse polarograph. Very high sensitivity is achieved by reducing the effect of random variation in the growth of the mercury drop,



Southern Analytical's pulse polarograph

and of variation in the current flowing through the thin film of electrolyte which enters the capillary tip.

Also new is the redesigned A1660 Davis differential cathode-ray polarograph which displays a five-fold improvement in signal-to-noise ratio. The A1672 dissolved oxygen meter can be used for the measurement of dissolved oxygen from 0.1 to 25 p.p.m. in any water from distilled to sea water.

Thin layer chromatography

Smith and Eltherington Ltd., 296 Regent Street, London W.1, who represent Carl Roth of Karlsruhe, German chemical manufacturers, can supply thin layer chromatography equipment for about £25. They also offer as little as 100 gram of any laboratory chemical required and up to 10 kg.

P.T.F.E. fittings

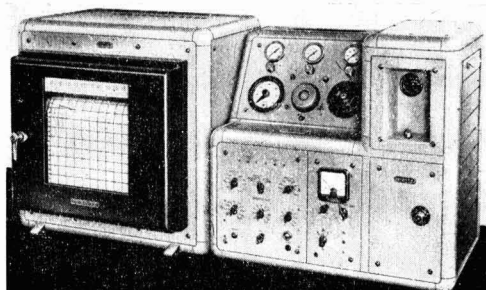
Stopcocks in p.t.f.e. made by **G. Springham and Co. Ltd.**, Harlow New Town, Essex, have a distinct advantage over glass where caustics, solvents and hydrocarbons are to be stored. Particularly in the field of gas chromatography a greaseless stopcock is desirable.

Temperature controller

A three-term solid state potentiometric temperature controller is manufactured by **West Instrument Ltd.**, 10 St. George's Place, Brighton. The operation is based on an entirely new principle which is claimed to result in higher efficiency and an output power of 11.1% max.

Laboratory muffles

Three new laboratory rectangular muffles are produced by **Wild Barfield Ltd.**, Otterspool Way, Watford By-Pass, Herts. These have been designed specifically for laboratory use and will cater for many of the general purpose heating applications that are a feature of laboratory routine over a wide field. The three new models range in width from 9 in. to 15 in., and the ratings are from 1,100 to 2,100 watts.



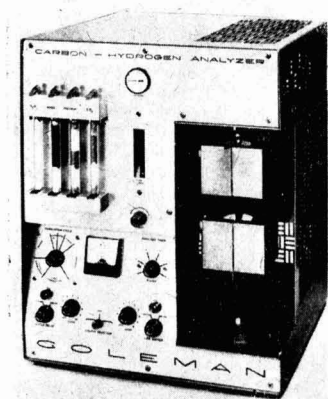
Shandon's FB-4 ionisation chromatograph

AUTOMATION IN THE LABORATORY

By **E. G. Thompson, M.A., technical sales manager, Baird and Tatlock (London) Ltd.**

THE application of automation and of electronic devices in industry is one of the most significant technical revolutions of our time. It is not surprising, therefore, that scientists should apply the same techniques to laboratory instruments.

In the last few years, chemical laboratories have seen a remarkable increase in instruments employing physical methods



Coleman carbon-hydrogen analyser

of analysis, utilising electronic techniques and taking advantage of the developments in automation.

Many conventional techniques of chemical analysis have been simplified and increased in sensitivity through the employment of physical rather than purely chemical methods. In chemical laboratories, in the future, there will be found an increasing use will be made of the techniques of spectrophotometry, polarography, spectrography, X-ray fluorescence, gas/liquid chromatography, and, in the more distant future, nuclear magnetic resonance and electron spin resonance.

Although physical methods of analysis lend themselves more easily to automation and the employment of electronic techniques, considerable strides have been made in the development of instruments designed to perform automatically conventional chemical operations such as titration, colorimetric analysis and elementary analysis by combustion.

In addition to the automatic instruments designed to perform specialised techniques, instrument manufacturers have also designed equipment which may be classified under the heading of automatic laboratory aids, such as auto-

matic pipetting devices, automatic burettes and automatic balances.

It is difficult to define rigidly the terms 'fully automatic'; 'automatic'; and 'semi-automatic.' In general, a fully automatic instrument will take its own measured sample, carry out an analysis, or perform a particular function, and record the result completely automatically. The semi-automatic instrument usually carries out automatically only certain parts of a chemical operation.

Typical of the fully automatic instruments are the auto-titrators and process gas chromatographs, which have found application in chemical plants rather than in the laboratory.

An instrument designed to automate a conventional analytical technique is the automatic Karl Fischer Titrator. The determination of moisture by Karl Fischer titration is a most useful technique but it requires an operator having considerable skill in estimating the endpoint consistently.

With manual titration, errors can occur, due to the operator and to fatigue (even the best analysts begin to tire after a few hours of repeated analysis), and therefore, less accurate and consistent results are obtained. The development of the automatic Karl Fischer Titrator has removed one of the most important sources of error in this titration, viz.: the accurate determination of the endpoint. In the automatic apparatus, the operator inserts the sample, turns a selector switch, pushes a start button and waits until a lamp lights, indicating that the titration is complete. All that remains to be done is for the operator to read the burette.

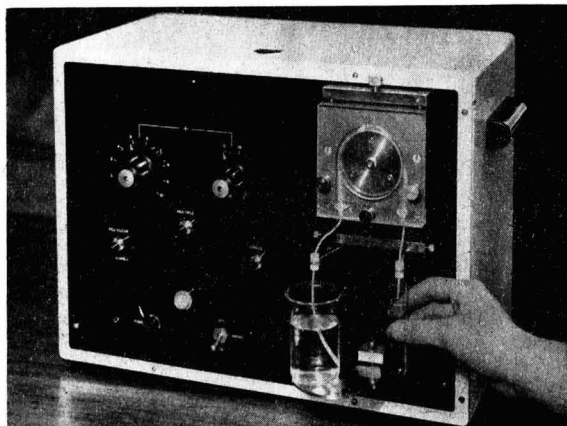
Elementary analysis is a common routine operation in organic research,

but the conventional Dumas and Pregl types of analysis require a very skilled operator to obtain reproducible results. Although the Belcher and Ingram rapid combustion method for determining carbon, hydrogen, halogens and sulphur, has considerably lessened the difficulty of micro elementary analysis, it still requires the services of skilled microchemists. Recently, new automatic instruments have been developed in the U.S. for carbon/hydrogen and nitrogen determinations, which reduce, even further, the errors due to the operator's technique. In the case of the nitrogen analyser, the operator merely has to weigh carefully a sample on a micro balance and insert it in the tube, turn a switch and wait nine minutes until the end of the cycle; after a simple manual adjustment of the nitrometer, the result is indicated on a digital counter and a simple calculation gives the percentage of nitrogen in the compound.

Although it is generally not classified as an automatic instrument, the modern gas/liquid chromatograph does, in fact, carry out, to a considerable degree, organic analyses automatically. Once the apparatus has been correctly set, the sample is inserted and, after a period, the result is recorded on a chart. Generally, the result has to be interpreted, but where a series of similar samples are being analysed and the instrument controls can be set at pre-determined positions, results are obtainable easily and automatically after the operator has inserted his measured sample. Gas chromatography is now a most powerful, sensitive and rapid technique in organic analysis and its application is likely to be even further developed during the next few years.

In inorganic analysis, particularly in the metallurgical field, the spectrophotometer provides a rapid means of analysing solid samples. Although fully automatic spectrophotographs tend to be rather expensive, nevertheless, their speed in carry-

(Continued on page 694)

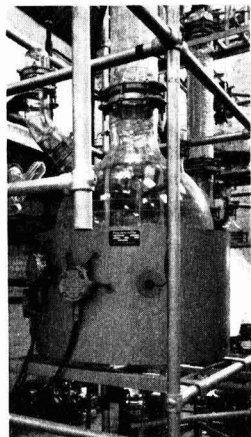


Automatic proportioning pipette

Surface heating mantles have become a standard tool in the laboratory

SINCE their first introduction in 1947, electric heating mantles have become a standard tool in most laboratories. Their application is varied, ranging from the preparation of compounds under given atmospheric conditions to the drying of substances under a vacuum at a fixed temperature.

Isomantles are produced by **Isopad Ltd.**, Barnet By-Pass, Boreham Wood. The heating surface of the mantles is



Pilot plant for organo-metallic compound at Peter Spence Ltd., Widnes. The flameproof Isomantle, 2 by 1 kW, 4 by 1.6 kW, is heating a 200 litre Q.V.F. flask

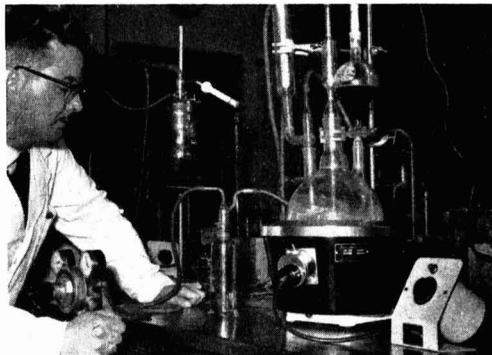
constructed from glass yarn withstanding temperatures up to 550°C. and the mantles are used for liquid temperatures up to 350°C. All standard Isomantles run at black heat transferring the heat to the liquid partly by radiation and partly by conduction so that uniform heat transfer is ensured and bumping avoided. The actual heating element incorporated in the glass cloth is fully insulated and placed in such a manner that both heat as well as voltage gradients between the elements are kept to a minimum. Even in the event of a spillage, short circuits and damage to the heating mantle are unlikely as the liquid will normally evaporate quickly.

The energy regulator, shown in the illustration, has proved to be very adequate for the control of most processes. It varies the power input from 100% down to 12% for full load by a cycling operation (between 40 and 75 secs.).

The same heating system is also used quite extensively on larger scale pilot plant and a full range of these appliances is made for all glass flasks up to 200 litre capacity by Isopad.

The chemical engineering department of the University of Birmingham used

An Isomantle used in the chemical laboratory of University College, London, for the preparation of organic compounds



a pilot plant, the heating components for which were supplied by Isopad, for distillation experiments. This plant is believed to be the largest of its kind in Europe.

The pilot plant was donated to Birmingham University by the Bahrain Petroleum Co. Ltd., a member of the Caltex group. Basically the unit was designed for maximum flexibility rather than for a specific operation.

A problem often encountered in laboratories is the necessity of heating in flameproof areas. Isopad produce Iso-

mantles specially for this situation. Isomantle type FPM has been developed in close co-operation with H.M. Inspector of Factories. The construction of a flameproof Isomantle is basically the same as the Isomantles for hemispherical vessels, but the heating element is metal-sheathed, mineral insulated, terminating in flameproof glands which are screwed into flameproof terminal boxes. The element sheath is earthed through the flameproof junction box so that no sparking or short circuit is possible even in the event of spillage.

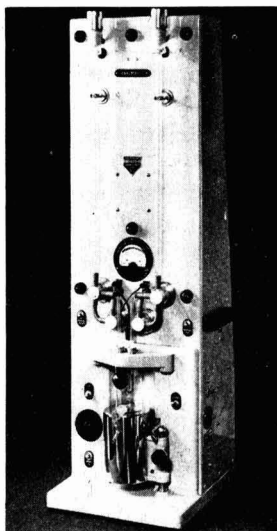
Automation in the laboratory

(Continued from previous page)

ing out analyses can frequently give an economic return as compared with the cost of employing chemists to carry out the work by conventional techniques. Similarly, equipment for X-ray fluorescence, although rather expensive, can become economic when large numbers of determinations have to be carried out.

Rapid progress is being made by the

instrument manufacturers in designing equipment for automatic or semi-automatic operation. Such instruments generally give more consistent results and permit a high degree of accuracy, even when used by relatively unskilled personnel. Although such equipment is generally fairly expensive as compared with their manual equivalents, the cost can nevertheless be justified in many cases by the saving in skilled man-power and through achieving greater consistency and accuracy.



Analmatic Karl Fischer apparatus for the determination of moisture

Record oxygen output set up at Margam

For the first time output at a U.K. oxygen-producing station has topped the 100 million cu. ft./week mark. This was achieved at the Margam works of British Oxygen which serves the Margam and Abbey works of the Steel Company of Wales Ltd., at Port Talbot.

The plant has a maximum capacity of around 700 tons of high-impurity oxygen a day, or 18 million cu. ft., and for some time has been producing nearly 100 million cu. ft./week. British Oxygen's Margam works, the biggest of its type in Europe, was the first tonnage oxygen plant to operate in the U.K., coming on stream in May 1956.

Most of the oxygen produced is used in open hearth and V.L.N. converters. The rest is used for general purposes, such as oxygen cutting, scarfing and welding.

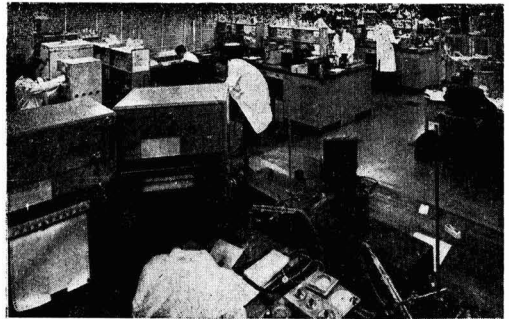
Pye's new Cambridge instrument centre will help meet demand

EXPANDING demands for chemical and physical instrumentation can be met by the increased production capacity provided by Pye's new scientific instrument centre in Cambridge, opened recently by Professor Sir John Baker, head of the engineering department of the University of Cambridge. The modern building houses the offices, laboratories and production plants of W. G. Pye and Co. Ltd., and their associated company, Unicam Instruments Ltd., scientific instrument makers.

Temperature-controlled rooms, dust-free areas and special fully-equipped laboratories are among the centre's facilities designed to provide ideal conditions for the development and manufacture of the companies' wide ranges. Unicam and Pye have both contributed notably to the advancement of knowledge in chemical analysis. Unicam's ultra-violet, visible, infra-red and flame spectrophotometers and Pye's argon chromatograph and pH meters are used for routine analyses and pure research in world-wide laboratories, factories and educational establishments.

Both companies employ teams of fully

General view of the chemical laboratories in Pye's new scientific instrument centre opened recently at Cambridge



qualified chemists who examine customers' problems and work out new applications for the instruments. Lectures at international symposia and scientific meetings, contacting of training schools and instruction sessions in the laboratories, and publication of application and method sheets are among the activities for which the centre is ideally suited.

Well over half of the joint production is exported, markets including Switzerland, Germany and the U.S.

R.I.C. licentiatehip approved

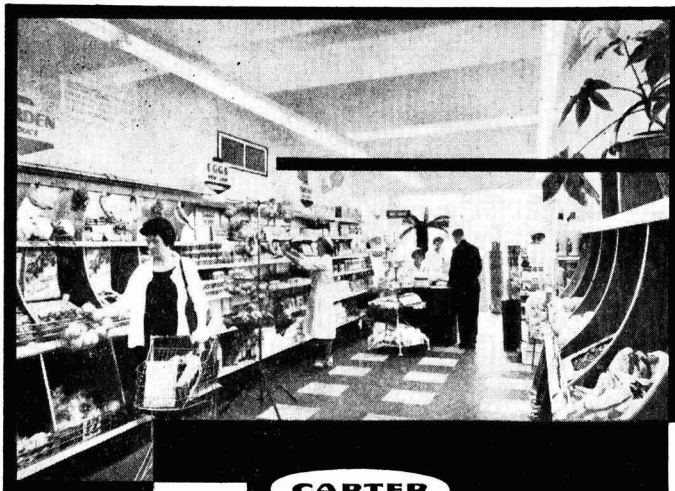
The establishment of Licentiatehip as a new grade of corporate membership of the Royal Institute of Chemistry has been finally approved, and amended by-laws have effect as from 14 March. The new grade is described in the current issue of the *R.I.C. Journal*.

Pakistan offers scope for U.K. insecticides

THAT there appears to be scope for increased sales of U.K. insecticides, pesticides and fungicides and spraying equipment, although competition, particularly from the U.S. and West Germany, is increasing, is among findings of a survey of the Pakistan market. It says indications are that imports of all those items are likely to increase over the remaining four years of the second Five Year Plan.

The report adds that U.K. manufacturers may well find a visit to Pakistan rewarding for discussions with the Department of Plant Protection, the newly formed Agricultural Development Corporations, importers and other uses.

Further information is available from the Export Services Branch, B.O.T., Lacon House, Theobald's Road, W.C.1.



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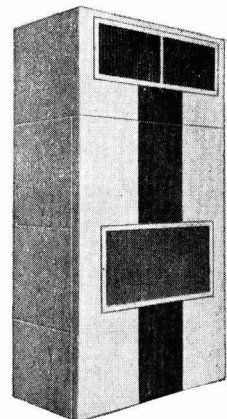
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MAJOR BREAK-THROUGH IN POLAROGRAPHY

Described by W. J. Parker, B.P.R.I. Director
at Slough College of Further Education

OVER 40 polarographers from West London, Berkshire, Buckinghamshire, Hampshire and North Surrey gathered at Slough College of Further Education on 4 and 11 April in order to attend the final Lectures of the 1962 series given by Mr. W. J. Parker. This series of lectures was organised by Dr. D. A. Davies of the Science Department, Slough College of Further Education. Visitors were also able to inspect the polarographs and associated equipment demonstrated in the Exhibition organised by the British Polarographic Research Institute.

It was hoped to provide these joint meetings regularly, and initially on a biennial basis, in order to provide an opportunity for polarographers to become acquainted with the outstanding developments now arising from year to year as a result of the massive investment by the polarograph manufacturers in extensive research and development programmes.

Major break-through. Two of the largest polarographic manufacturers in the U.K., **Baird and Tatlock Ltd.** and the **Cambridge Instrument Co. Ltd.** have combined their technical resources to produce the first commercial multi-source, multi-constituent, on-stream, continuous polarographic analyser which is completely automatic in operation. Current research and development is aimed at providing proportional pneumatic output for automatic process control. Continuous automatic control of process plant operation, using polarographic sensing systems, would then become a practicable reality, and lead to progressive economies in labour and materials.

By combining the extensive experience of Baird and Tatlock in automatic sample handling with the Cambridge know-how on high sensitivity polarography, based on the phase-selective A.C. polarograph, a unique automatic control instrument has materialised, with a versatility and sensitivity which was quite exceptional in one unit.

Although currently incorporating the dropping-mercury electrode, it was anticipated that the sensitivity, and the operational period without maintenance attention, might be considerably increased by incorporating either the Knowles Wide-Bore Electrode, or one of the constant-area, renewable surface types of electrode currently under development at the B.P.R.I., such as the Griffiths-Parker Flowing Mercury Electrode or the Bergen-Parker Flowing-Solution Electrode.

Dissolved oxygen recorders. Further outstanding advances had been achieved in the design of electrode and cell systems for batch or continuous measurement of the oxygen contents of biological fluids and of manual waters, effluents and sewage.

A new addition to the family of manufacturers producing oxygen polarographs was **Electronic Instruments Ltd.**, which have been active in the pH meter field since the war. This Company was now developing a polarographic diffusion electrode which when coupled to the standard E.I.L. millivoltmeter will provide an inexpensive, but efficient and sensitive, biological Oxygen Analyser which could prove of great value not only for clinical work but also for the fermentation industries.

For high sensitivity oxygen recording, the Cambridge multi-point boiler-water analyser is still supreme, having an accuracy of better than 0.0005 ppm., in the range 0.01 ppm. full scale. This very high performance was illustrative of the new realms of ultra-high sensitivity into which polarography was now penetrating, stated Mr. Parker.

High-sensitivity multi-component polarographic equipment. The recent introduction of the Pulse Polarograph by Southern Analytical has filled the gap for a high sensitivity instrument, with a sensitivity in the 10^{-7} - 10^{-8} M. range, but which would provide alternative step-type or peak-type polarograms.

The latest model of the square-wave polarograph, produced by **Mervyn Instruments**, provided in addition to high sensitivity, a number of valuable features for electro-chemical kinetic studies, the potentialities of which have still to be fully explored.

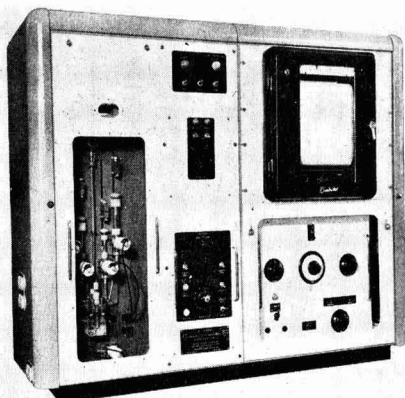
Both the pulse and square-wave polarographs were products of the Barker-Milner stable at Harwell, from which issued a steady stream of fundamental truths on basic polarographic phenomena and a continuing series of outstanding analytical instruments of increasing sensitivity, resolution and refinement of technique.

The research endeavours of the U.K.A.E.A. Woolwich Research Team, led by H. M. Davis, had also produced their ultimate reward in the production of both **Southern Analytical** and **Nash and Thompson, Ltd.**, of the differential cathode-ray polarograph, which provided such convenient facilities for subtractive, comparative, derivative and normal polarography, all in one instrument and at a useful high sensitivity beyond the 10^{-6} M. range.

D.C. polarographic equipment. Mr. Parker stressed the outstanding developments achieved by Mrs. B. Lamb, the pioneer of much of the D.C. equipment and know-how in this country. Mrs. Lamb had produced a new order of D.C. polarograph development in the Mark 200 instrument, which incorporated the long awaited British counterpart of the German Atlas Tast System of current measurement.

The new Tinsley peak-current reading unit eliminated the charging current and permitted virtually undamped polarograms at all sensitivities, without loss of resolution on both direct and derivative circuits, with a claimed sensitivity down to and beyond 0.02 ppm.

(Continued on page 702)



Baird and Tatlock/Cambridge automatic polarograph for process control in industrial plant. This multi-purpose unit will shortly incorporate pneumatic output for automatic process control

● **Mr. Stanley H. Elliott, M.B.E.**, chairman and managing director of H. J. Elliott Ltd., manufacturers of the E-Mil range of graduated laboratory glassware, left on Easter Monday for a six weeks visit to customers and business contacts in France, Germany, Norway, Sweden and Finland.

● **Dr. P. Gross**, principal scientist of the Fulmer Research Institute, Stoke Poges, Bucks. has been appointed to the board of directors. **Mr. E. A. G. Liddiard**, director of research, remains as senior executive director with responsibility for administration.

● **Dr. R. E. Parker**, lecturer in organic chemistry at the University of Southampton is the new secretary and registrar of the Royal Institute of Chemistry. His name was incorrectly given in last week's issue on p. 651. Aged 36, he graduated B.Sc. at Leicester in 1946 and held the first tutorial studentship in chemistry at King's College, London, 1946-7, since when he has occupied teaching posts at



R. E. Parker

Southampton University. His research has been in physical organic chemistry, with papers in *J. Chem. Soc.*, *J. Amer. Chem. Soc.*, and *Chemical Reviews*, particularly on mechanisms of epoxide reactions and mechanisms of nucleophilic displacement reactions in aromatic systems. He has been an active member (chairman 1956-58) of the Mid-Southern Counties section of the R.I.C. and a member of the R.I.C. Council from 1959 to 1962. Dr. Parker is particularly interested in the Institute's work in chemical education.

● **Mr. W. B. Davies** has been appointed vice-chairman of Lawes Chemical Co. Ltd., Barking, Essex, and has relinquished his appointment as managing director. **Mr. H. B. Davies** and **Mr. J. B. Davies** have been appointed joint managing directors.

● **Dr. Helmut Brands, Herr Richard Freudenberg, Herr Fritz Gröning** and **Herr Heinrich G. Köhler** have been recommended for election to the board of control of Farbenfabriken Bayer AG, Leverkusen, and **Dr. Otto Einsler** and **Dr. Julius Drucker** for election to deputy membership. Of the previous board of control, **Dr. Gustav Cremer, Dr. Theo Goldschmidt** and **Dr. Otto Schniewind** are not seeking re-election.

● **Dr. Milan F. Ondrus** has been appointed manager of Deutsche Dow Chemie GmbH, Frankfurt-on-Main.

PEOPLE in the news

● **Dr. N. H. Poynton** has been appointed to the board of directors of Wm. Butler and Co. (Bristol) Ltd.

● **Mr. K. J. Austin**, who has been the accountant at Dunlop Chemical Products Division since 1957, has been appointed secretary to the Tyre Division local board at Fort Dunlop, Birmingham. His successor at Chemical Products Division is **Mr. Finlay J. McLellan**.

● **Mr. S. B. Casson**, who joined the Kestner Evaporator and Engineering Co. Ltd., 5 Grosvenor Gardens, London, S.W.1, in 1949 is retiring as technical sales engineer in the north-west of England. Before joining Kestner's, he served with I.C.I. at Widnes and Billingham as plant manager and division manager respectively. Mr. Casson will be succeeded by **Mr. W. G. Stokes**, who will also cover the north-west and operate from Liverpool. He has had extensive experience in the chemical in-

dustry and has been with A. Boake Roberts and Co. Ltd., and other companies.

● **Mr. N. D. Macleod** has been appointed manager of a new development department formed by I.C.I. Plastics Division at their Welwyn Garden City headquarters for work on the products of the division and on processes used by the plastics industry.

He will be assisted by two division leaders, **Mr. B. S. Dyer**, division leader (polypropylene and new products), Technical Service and Development Dept., and **Mr. H. A. Rigby**, who has been with I.C.I. (New York) Ltd. **Dr. J. Gadsby** will continue as manager of the T.S.D. at Welwyn Garden City and both departments will be the responsibility of **Mr. Maldwyn Jones**, I.C.I. Plastics Division development director.



N. D. Macleod



J. K. Gregory

● **Mr. J. K. Gregory** has been appointed exports sales manager of the industrial chemicals division of A. Boake Roberts and Co. Ltd., whom he joined in 1956. He recently returned after two years with their subsidiary company in Madras.

Market Reports

MOVEMENT RESTRICTED BY HOLIDAY PERIOD

LONDON The movement of chemicals to the consuming industries against contracts has been temporarily restricted by the Easter holiday break, which has made for quieter trading in most sections of the market.

More active conditions are looked for during the coming weeks and there is a steady flow of export enquiry in circulation, much of which is likely to find its way to the order books. The seasonal demand for fertilisers has been well maintained and supplies are reported to be readily available.

Among the coal tar products there has been a steady call for refined tar and cresylic acid on home and export account, with little change on balance in the other sections of this market.

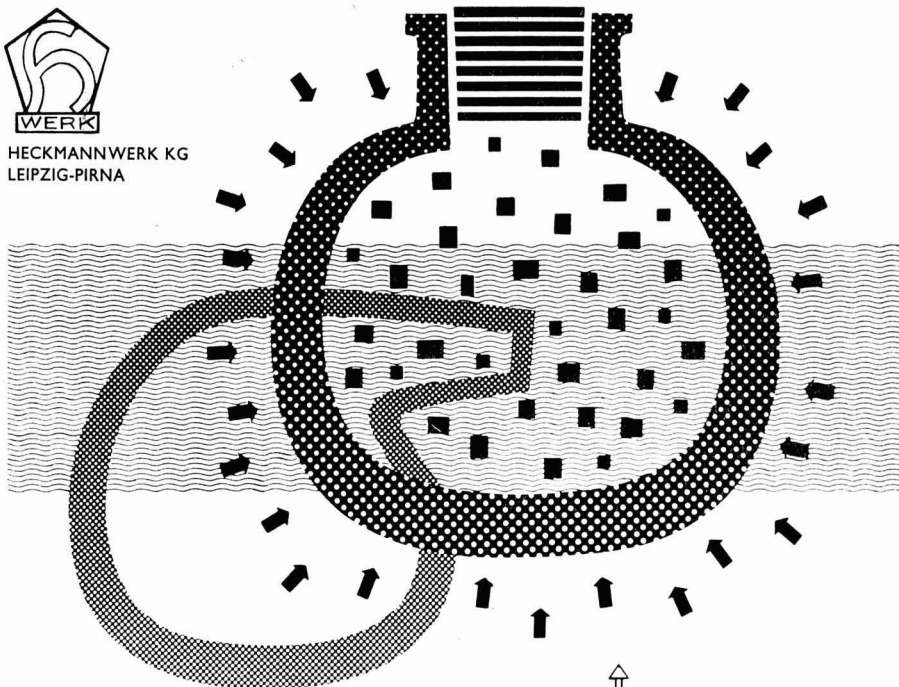
MANCHESTER From the point of view of fresh business the Manchester market opened on a quiet note on the resumption after the holiday stoppage, but contract deliveries are moving again on a satisfactory scale. With an odd

exception, prices generally show little change. Demand for textile bleaching, dyeing and finishing chemicals is no more than fair. A steady trade is being done in most sections of the tar products market, a feature of which has been a slight rise in solvent prices.

SCOTLAND The past week has been one of steady demand in the trade in general; in some cases an increase in off-take has been experienced, more than likely due to the desire to have stocks on hand for resumption after the Easter break. The general feeling is that the increase in trade experienced particularly over the last few weeks has been maintained. The demand from the agricultural trade, particularly for concentrates, is still high owing to lack of natural growth and in some cases the manufacturers are being hard pushed to meet this, but generally speaking deliveries are being met. Export demand seems to be following the usual pattern.



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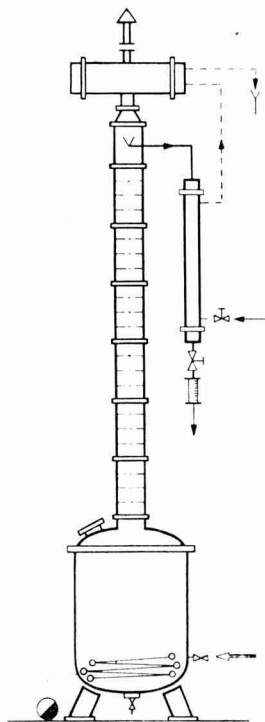
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Commercial News

Consolidated Zinc

Group trading balance of Consolidated Zinc Corporation for 1961 was £5,164,531 (£3,454,250). Tax took £298,807 (£1,145,582) and net profit was £1,526,403 (£2,295,660). Final dividend is 2s 3d/share, making 3s (4s).

Lobitos

Group net profit of Lobitos Oilfields in 1961 totalled £2,014,870 (£2,098,730). Dividend is 28% (same). Mr. F. C. Bowring, chairman, refers to intensely competitive conditions and says the group's aim is to develop and strengthen its position, particularly in petroleum specialities.

McKechnie Brothers

McKechnie Brothers Ltd. are to pay an interim of 4% on ordinary for the year ending 31 July 1962. In spite of difficult conditions in the U.K., group trading results to date are not unsatisfactory; the increase in the interim dividend is to level up payments and must not be regarded as an indication of an increased total distribution for the year.

Permutit

Group profits of the Permutit Co. Ltd. for 1961 were £361,580 (£406,099). Net profit was £138,750 (£160,528) after tax of £128,000 (£157,000) and depreciation of £94,830 (£88,571). A final dividend of 1½% makes 20% (same).

Rio Tinto

Group net profit of Rio Tinto Co. Ltd. for 1961 was £5,173,000 (£3,155,000) after tax of £1,976,000 (£1,611,000). Dividend is 3s/share (2s 9d).

John and E. Sturge

With capacity in many cases outstripping the immediate demands of consumption, profit margins have been reduced and for 1961 John and E. Sturge Ltd. report a fall in group net profit from £143,876 to £75,511. Difficult trading conditions have not restricted Sturge's development programme, says Mr. A. L. Wilson, chairman.

Spending on U.K. plants in 1961 was about £200,000, considerably less than the peak year of 1960, but the immediate programme is coming to an end and capital spending in 1962 should be less than in 1961. More than half of the £143,000 spent overseas went to Sturge (Canada) Ltd. Remainder of overseas expenditure was incurred in the purchases of shares in the associated company in India and in acquiring the remaining 40% minority interest of the French company.

Mr. Wilson believes that the current surplus capacity in plants making products similar to those of Sturge throughout the world may be of fairly brief duration due to the continued improve-

- Lobitos to expand in speciality field
- Overcapacity may be brief, say Sturge
- A.B.C.D. expect better results in 1962
- Edison report 18.5% rise in chemical sales

ment in world living standards, which would lead to increased consumption. He stressed, however, that while present trading conditions persist Sturge's already heavily cut profit margins must remain vulnerable. Until increasing demand caught up with surplus capacity, it seemed certain that uneconomic competition would keep margins at a very low level. No firmer forecast of the Sturge's prospects was possible. (See also 'Project News'.)

A.B.C.D.

The balance sheet of A.B.C.D., who operate petrochemical plants at Ragusa, Sicily, has been closed with a net profit of 163,861,853 lire (£93,000) for the year to 30 September. At the recent annual meeting it was reported that output of polythene resins had been very satisfactory both as regards quality and quantity. However, the market had not come up to expectations. Since the company was expanding its plants and working out cost cuts, better results were expected during the current year.

A.N.I.C.

A.N.I.C., of San Donato Milanese, the chemical operating company of the E.N.I. Group, report a 1961 net profit of 3,246 million lire (£1.87 million).

Almitalia

Almitalia S.p.A. has been set up at Carasco, near Genoa, as a joint venture of Goodlass Wall and Lead Industries Ltd., London and Beghe and Chiapetta of Milan for the production of zirconium silicates. Beghe and Chiapetta have been marketing these compounds in Italy on behalf of Associated Lead Manufacturers Ltd., associates of Goodlass Wall. Almitalia's plant will be on stream late this year.

American Celanese

First quarter 1962 sales of the Celanese Corporation of America were a record, while earnings were equivalent to 7 cents/share (32 cents).

Antar-Petroles

Report of Antar-Petroles de L'Atlantique, to be presented at the annual meeting on 28 May, will show a 1961 net profit of NF8,290,123 or £50,000, after all charges. Turnover was NF1,260 million, or £91 million (NF1,163 million or £84 million). A dividend of NF4.50 (NF4) is proposed. The parent company, Socratant, hold 915,239 of the 1,683,000 NF50 shares. In addition to petrol, LPG, white spirit, gas and fuel

oils, the Donges refinery and associated plants also produce bitumen, benzene, toluene and xylenes.

Carlo Erba

Net profit of Carlo Erba, pharmaceutical producers, Italy, for 1961 was 662 million lire (£378,000). Capital is to be raised from 3,500 million lire to 55,250 million lire.

[Cassella Farbwerke

Cassella Farbwerke Mainkur AG, dyestuffs producers, Frankfurt, are like their three parent companies, Bayer, Hoechst and B.A.S.F., to pay a 1961 dividend of 18% (same). Dividend will be paid on some DM34,100,000 of capital.

Edison

In the past few years, Edison of Milan have invested some 300,000 million lire, or £171 million, in their chemical interests. Sales rose by 18.5% in 1961, but there is still some spare capacity. Capital is to be raised to 276,000 million lire by increasing the nominal value of shares from 2,000 lire to 2,300 lire.

Sincat's plants at Priolo were operated at a normal pace while the construction of adjoining petrochemical plants went ahead. Sales of fertilisers increased but prices were far from adequate. Celene continued their plant building programme and expect to have satisfactory results starting in 1963.

General Chemical

Group net profit of the General Chemical Corporation (incorporated in Southern Rhodesia) for 1961 was R122,904 (R190,102 for 16 months), subject to tax of R41,917 (R42,704 plus tax adjustment R1,090). Dividend is R36,144 (same). To general reserve R50,000 (same), forward, including R478 (nil) tax adjustment, R121,213 (R125,892 after preliminary expenses R732). Current assets R1,496,233 (R1,486,474) and liabilities R623,053 (R655,986). Turnover figures have been maintained at a satisfactory level since the close of the financial year, says chairman. Meeting, Johannesburg, 30 April.

Houdry

Following the merger of Houdry Process Corporation into Air Products and Chemicals Inc., the business formerly carried on by Houdry is now being continued by Houdry Process and Chemical Co., a division of Air Products and Chemicals Inc. The officers of Houdry

(Continued on page 702)

DOW



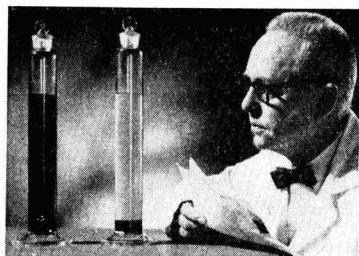
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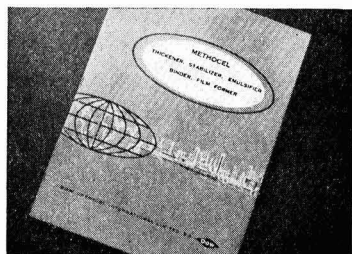
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Decline in Lenzing sales ; details of Tunisia phosphate agreement

remain in charge of their respective functions as officers of the division. General offices of the Houdry Division are at 1528 Walnut Street, Philadelphia 2, Pa.

Kaiser Aluminium

First quarter sales of Kaiser Aluminium and Chemical were \$108,273,000 (\$96,277,000), with earnings at 41 cent/share (16 cents).

Kawecki Chemical

First quarter 1962 earnings of Kawecki Chemical of the U.S. were 88 cents/share (67 cents).

L'Air Liquide

Net dividend on ordinary of NF7/share (NF6.50) is proposed by L'Air Liquide of France.

Lenzing

Turnover of Zellwolle Lenzing, man-made fibre producers, Austria, last year was valued at Sch760 million, or £10.5 million, some Sch50 million below the 1960 level. Output of rayon totalled 48,000 tonnes, 4,700 tonnes down. Dividend is 3% (6%). The company's name is to be changed to Chemiefaser Lenzing.

Lenzing are to go ahead with plans to produce acrylic fibres. This was to have been a joint venture with Stickstoffwerke, but the latter company has backed out and postponed indefinitely its plans to make acrylonitrile.

National Distillers

Sales of National Distillers and Chemical in the first quarter of 1962 were 10% up, totalling \$187,489,000 (\$169,796,000). Net profits rose 20% to 46 cents/share (37 cents). This upward trend, started in the last half of 1961, is expected to continue this year, provided general economic factors remain favourable.

Reichhold

Reichhold Chemicals had record sales in the first quarter of 1962, with earnings of 11 cents/share (1 cent).

Petrogas

Petrogas Processing Ltd. are now producing more than 100 million cu. ft. of pipeline gas daily, it was stated at the annual meeting held recently in Calgary. Capacity of the company's facilities is 170 million cu. ft. daily. In addition to gas, Petrogas also produce 1,800 million cu. ft. daily of condensate and from 500 to 700 long tons daily of elemental sulphur. The processing plant went into production at end of November last year.

Petrogas are owned by Regasfield operators, with Jefferson Lake Petrochemicals of Canada, Ltd., the largest single shareholder and also the purchaser of the processing plant's sulphur

production. Pipeline gas is sold under contract to Westcoast Transmission Co.

Snia Viscosa

During 1961, construction of rayon plants in India has been in hand for South Indian Viscose, it is stated in the Snia Viscosa annual report. These plants include units for sulphuric acid and carbon disulphide. Equipment has been exported to Allied Chemical, U.S., for a polyamide plant and Snia Viscosa-built plant in the Soviet Union is already producing nylon-6; the group has also exported equipment to the U.S.S.R. for the production of caprolactam. Under a contract with a Japanese company, a plant is being built in Japan for a nylon-6 plant.

S.A.I.C.I., an affiliated company, now have capacity for 100,000 tonnes/year of cellulose and is currently engaged in further expansion.

Major break-through in polarography

(Continued from page 696)

The horizontal chart was also a virtue which had been long awaited and was now successfully incorporated in a standard polarograph.

The Tinsley Mark 19 and Minor Polarographs continued to provide Normal and Derivative Polarography in the 10^{-2} - 10^{-4} range and beyond.

A useful accessory produced by the Shandon Scientific Co., which markets the Metrohm polarograph in the U.K., is the Microcap unit for accurate addition of standards to polarographic solutions in the cells, thereby adding to the accuracy of calibration procedures.

Future Developments. The most important developments, said Mr. Parker,

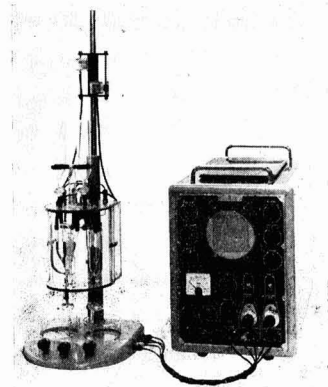
would be the Packaged General-Purpose Polarographic Control Consoles for immediate installation on process plants, in all industries, from food to fuel, from metallurgy to explosives manufacture.

These consoles would contain all the necessary equipment for extraction of process solutions from vessels and pipelines, for their pre-treatment, analysis, and disposal. The console would contain polarographs of both the visual-indicating and recording types, to permit immediate adjustments to plant operating variables, as well as long-term changes in conditions to conform to slowly changing variables. Both D.C. and A.C. systems would be necessary to deal with varying reversibilities, resolutions and concentrations, with differential systems for eliminating interfering responses.

Manufacturers represented at the exhibition were: U.K.—Baird and Tatlock Ltd., Cambridge Instrument Co. Ltd., Electronic Instruments Ltd., Evershed and Vignoles Ltd., Mervyn Instruments Ltd., Nash and Thompson Ltd., Shandon Scientific Co. Ltd., Southern Analytical Co. Ltd.; France—Association des Ouvrieres en Instruments de Precision Ltd., Mecil Ltd.; Germany—Atlas-Werke AG; Denmark—Radiometer Ltd.; U.S.—Leeds and Northrup Ltd., E. H. Sargent and Co.; Switzerland—Metrohm Ltd.; Czechoslovakia—Kovo Co.

Will

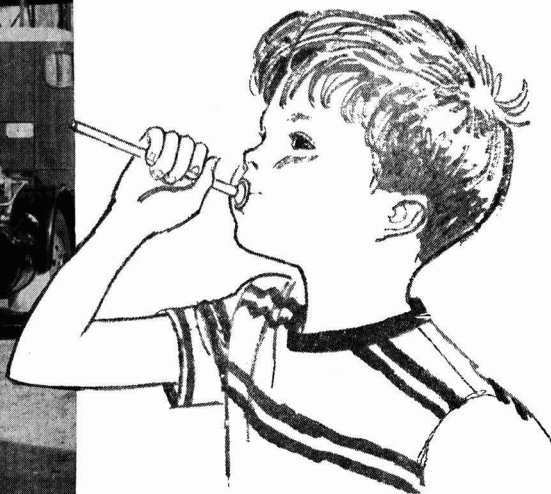
Mr. Harry Elvin, senior representative of Witco Chemical Co. Ltd., who died on 29 December last, left £10,137 gross, £10,023 net (duty paid £396).



Nash and Thompson differential cathode-ray polarograph for continuous analysis of complex solutions



A pipeful of beads...



Price's Publication "The Receipt and Storage of Products in Bulk" will interest you. It has been rewritten and reissued to include data on the handling of stearine beads. Ask for Technical Publication No. 8.

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TRADE NOTES

Atlas anti-corrosive paints

Known as Ruskilla, Triplecote, a new two-coat painting system by Atlas Preservative Co. Ltd., Fraser Road, Erith, Kent, is stated to give an exceptionally tough and durable protective layer on iron and steel. After thorough surface preparation, the system calls for one coat of primer and one of finish, but this is claimed to give a thicker total film and far greater durability than three or even four-coat processes.

Rigid vinyl sheeting

BX Plastics Ltd., Manningtree, Essex, have published a six-page, three-colour brochure describing their new range of opaque and translucent corrugated Cobex rigid vinyl sheeting. The brochure contains illustrations of various roofing, cladding, lighting and decorative applications where this form of plain or coloured sheeting has been employed both on inside and outside work.

Bulk handling plant

Details of the Douglas liquid processing and bulk handling plant produced for Wm. Douglas and Sons (Engineering) Ltd. are given in a new colour brochure available from Baker Perkins Ltd., Westwood Works, Peterborough.

Change of address

The Midlands office of Acheson Col-

loids Ltd. has been moved from Moseley to more convenient new premises in the centre of Birmingham at St. Martin's House, Bull Ring, Birmingham 5 (Midland 1559).

The Engineering and Building Centre has moved to its new premises at Broad Street, Birmingham 1 (Midland 1914).

Kestner products

Desiccation of air and gases, an essential ancillary operation in many industries, particularly the oil, chemical and food processing, is the subject of a new illustrated technical broadsheet, No. 318, by the Kestner Evaporator and Engineering Co. Ltd., 5 Grosvenor Gardens, London, S.W.1, which for 50 years have specialised in silica gel plant for this.

In another brochure, No. 317, the company describe their film driers and drum flakes. These consist of drums on to which a film of liquor is deposited, and dried by internal heat, or crystallised by internal chilling. The end product is continuously discharged either as a powder, crystals or flakes.

Corapel enamels

Full information on their range of Corapel enamels and primers for pipeline protection are contained in a booklet issued recently by Yorkshire Tar Distillers Ltd., P.O. Box No. 1, Cleckheaton, Yorks.

DIARY DATES

MONDAY 30 APRIL

C.S.—Leicester: Col. of Art and Tech., 3.30 p.m. 'Quantitative studies in aromatic substitution with the aid of gas chromatography' by Dr. R. O. C. Norman.

Inst. Plant E.—Leeds: Univ., 7.30 p.m. 'Factors governing the design of industrial boiler plant' by A. Ridings.

Plas. Inst.—Birmingham 3: James Watt Memorial Inst., Gt., Charles St., 7 p.m. 'Architectural and other uses of glass reinforced plastics laminates' by J. R. Stevenson.

S.C.I.—London: 14, Belgrave Sq., S.W.1, 5.30 p.m. 'Recent developments in the field of wetting, emulsion and foam' by Prof. D. G. Derwichian.

TUESDAY 1 MAY

I. Chem. E.—London: The Park Lane Hotel, Piccadilly, W.1, 40th A.g.m. and Annual Dinner and Dance.

S.A.C.—Northampton: Tech. Col., 6.15 p.m. 'Recent developments in the analysis of semi-conductors'.

WEDNESDAY 2 MAY

C.S.—Durham: Sc. Labs. Univ., 5 p.m. 'Recent results on metal r-complexes of unsaturated hydrocarbons' by Prof. E. O. Fischer.

S.A.C.—London: The Wellcome Bld., Euston Rd., N.W.1, 2.45 p.m. 'The determination of sterols.'

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.30 p.m. 'The texture of polymers' by R. Palmer.

THURSDAY 3 MAY

Inst. Metal Finishing—Manchester: Ogden Arms Hotel, Sackville St., 7.30 p.m. A.g.m.

Iron & Steel Inst. & S.C.I.—London: Denison House, 296, Vauxhall Bridge Rd., S.W.1, 10 a.m. Conference on 'New horizons in stainless steel.'

S.C.I.—London: 14, Belgrave Sq., S.W.1, 6 p.m. A.g.m. and film show.

S.C.I.—London: Hoare Memorial Hall, Church Hs., S.W.1, 6.30 p.m. 'Studying surface films on metals optically' by A. B. Winterbottom.

S. Instr. Tech.—London: Manson Hs., Portland Pl., 6.15 p.m. A.g.m. 7 p.m. 'A fully integrated production control system by second generation computer' by E. C. Clear Hill.

The PUNGOR-type high-frequency TITRIMETER

Operates in the vicinity of the 150 Mc frequency. It can be used for the determination of acids and bases in aqueous and non-aqueous solvents. It lends itself to precipitation tests as encountered in argentometric measurement or in sulphate and alcaloid determination, etc. It permits the temporal variations of fluids in enclosed ampoules to be observed by watching the changes of the conductivity. Finally, it can be used as an indicator for process inside ion exchanging columns.

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Marchon

NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 5s including postage; annual subscription £12 10s.

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.

AMENDED SPECIFICATIONS

Open to public inspection 9 May

Phenothiazine derivatives and their preparation. Sterling Drug Inc. 849 137
Preparation of cyclopentanophenanthrene compounds. British Drug Houses Ltd. 826 790

ACCEPTANCES

Open to public inspection 16 May

Bis-isocyanatomethyl-cyclobutane and its use in the production of cross-linked plastics of high molecular weight. Farbenfabriken Bayer AG. 896 324
Water-soluble salts of heterocyclic compounds. Farbenfabriken Bayer AG. 896 846
Polymerisation process. National Distillers & Chemical Corporation. 896 496
Copolymerisation process and products therefrom. National Distillers & Chemical Corporation. 896 656
Process for the manufacture of benzohydroquinone derivatives. Hoffmann-La Roche & Co. AG, F. 896 719
Methods of preparing ortho-disubstituted β -amino-benzoic acid derivatives. Lääketehdas Orion Oy. 896 720
Process for improving the thermal oxidative degradation and simultaneous purification of linear polyolefins. Badische Anilin- & Soda-Fabrik AG. 896 306
High polymer age resisters. Goodrich Co., B. F. 896 308
Vulcanisation of amorphous polymers and copolymers of alpha-olefins. Montecatini. 896 309
Polymerisation catalysts. Du Pont of Canada Ltd. 896 310
Derivatives of 3:4-dihydro-1:2:4-benzothiadiazine-1:1-dioxide and process for their manufacture. Ciba Ltd. 896 721
Sulphonyl semicarbazides as blowing agents. United States Rubber Co. 896 497
Synthetic rubber or resinous compositions. Aziende Colori Nazionali Affini Aena SpA. 896 327
Process for aromatising hydrocarbons. Shell Internationale Research Maatschappij NV. 896 331
Conditioned ammonium bicarbonate fertiliser. Fertilizers & Chemicals Ltd. and Strauchen, A. 986 284
Derivatives of paromomycin and methods for their production. 896 774
Polymer compositions. Shell Internationale Research Maatschappij NV. 896 250
Desulphurisation of hydrocarbons. Kellogg Co. [Divided out of 896 294.] 896 295
Process for polymerising vinyl chloride. Solvay et Cie. 896 285
Process of preparing 4-hydroxy-3-keto-4-androstenes. Soc. Farmaceutici Italia. 896 286
Hydrofluorination of alkynes. Continental Oil Co. 896 459

Steroids and the manufacture thereof. Upjohn Co. [Divided out of 896 817.] 896 818
Selective ion-exchange membranes. American Machine & Foundry Co. [Divided out of 896 739.] 896 740

Open to public inspection 30 May

Production of copolymeric products. Courtaulds Ltd. 897 697
Alkyd resins. Standard Oil Co. 897 525
Manufacture of dialkyl alkylphosphonothionates. National Research Development Corporation. 897 698
Process for the manufacture of chlorohydrin modified phenol-formaldehyde resins. Stella SA. 897 782
Treatment of oxides. British Titan Products Co. Ltd. 897 501
Cyclopentanophenanthrene derivatives. Syntex SA. 897 732
Disinfecting and deodorising compositions. Brook Chemicals Ltd. 897 733
Method of dehydrating gypsum. Compton, C. E. 897 925
Methods of producing aromatic sulphones. Philips' Gloelampenfabrieken NV. 897 722
Removal of hydrogen cyanide from gas or aqueous solutions. Koppers Co. Inc. 897 543
S-triazolo[2,3-C]pyrimidine derivatives. Imperial Chemical Industries Ltd. 897 870
Pharmaceutical compositions containing polyglycols. Lafon, L. 897 743
Copolyesters. Imperial Chemical Industries Ltd. 897 640
Ammonium nitrate compositions. Imperial Chemical Industries Ltd. 897 642
Graft polymer-polyurethane rubber blends of high tear resistance. Borg-Warner Corporation. 897 705
Insoluble monoazo colouring matters containing isopropylsulphamyl groups. Imperial Chemical Industries Ltd. 897 484
Polyolefin mixtures and shaped structures prepared therefrom. Farbwerke Hoechst AG. 897 643
Manufacture of organic boron compounds. United States Borax & Chemical Corporation. 897 485
Preparation of antibiotic aspartocin. American Cyanamid Co. 897 581
Substituted 3:3'-3-triphenyl-propylamines and process for their manufacture. Farbwerke Hoechst AG. 897 693
Dyestuff of the perylene tetracarboxylic acid series. Farbwerke Hoechst AG. [Addition to 837 326.] 897 554, 897 707
Production of calcium oxide and barium sulphide from mixtures including calcium carbonate, barium sulphate, barium carbonate and calcium hydroxide. Sterling Drug Inc. 897 589
Process for the production of a low molecular weight glycidyl polyether of a polyhydric phenol. Shell Internationale Research Maatschappij NV. 897 744
Anhydrous halides of refractory metals. Metal Chlorides Corporation. 897 904
Organo mercury derivatives, their manufacture and use as preservatives. Boots Pure Drug Co. Ltd. 897 854
Purification of gelatine. Permutit Co. Ltd. 897 435
1,3-dimethylol-4,5-bis(alkoxy)-2-imidazolidinones and use of same. Sumitomo Chemical Co. Ltd. 897 757
Process for the manufacture of polyethylene imine. Farbenfabriken Wolfen Veb. 897 746
Continuous process for preparing uranium hexafluoride from uranium tetrafluoride and oxygen. United States Atomic Energy Commission. 897 793
Tetracycline derivatives. Soc. D'Etudes de Recherches et D'Applications Scientifiques et

Medicales E.R.A.S.M.E. [Addition to 891 004.] 897 826
Polyazo dyestuffs and copper complexes thereof. Farbenfabriken Bayer AG. 897 437
Purification of nitrogen-containing hydrocarbon liquids. Shell Internationale Research Maatschappij NV. 897 438
6-aminopenicillanic acid. Farbenfabriken Bayer AG. 897 617
Low density, resilient polyurethane foams. Goodrich Co., B. F. 897 710
Anthraquinone or perylene tetracarboxylic acid diimide dyestuffs containing triazine radicals and process for their manufacture. Ciba Ltd. 897 487
Manufacture of polyethylene film. Du Pont de Nemours & Co., E. I. 897 518
Process for the production of 2,3,6-trichlorobenzoic acid. Farbenfabriken Bayer AG. 897 694
Acylthio-steroids. Shionogi & Co. Ltd. 897 797
Process for preparing alkyl aluminium sesquihalides. Goodrich-Gulf Chemicals Inc. 897 679
Process for extracting isobutylene from mixtures of isobutylene with other C_4 hydrocarbons. Polymer Corporation Ltd. 897 584
Polyamides. American Cyanamid Co. 897 680
Process for the preparation of alkylboranes. Continental Oil Co. 897 798
Sulphonamides. Shionogi & Co. Ltd. 897 440
Process for the enzymatic acylation of 6-aminopenicillanic acids. Farbenfabriken Bayer AG. 897 618
Catalytic hydrogenating refining of hydrocarbons. Metallgesellschaft AG [Addition to 826 607.] 897 586
Pharmaceutical compositions comprising hydroxylamine and derivatives thereof. Koninklijke Pharmaceutische Fabrieken Voorheen Brocadesstheeman & Pharmacia NV. 897 470
Process for the production of benzene carboxylic acids. Badische Anilin- & Soda-Fabrik AG. 897 801
Purifying hydrocarbons. Kellogg Co., M. W. 897 664
Process for the manufacture of unsaturated ethers. Hoffmann-La Roche & Co. AG, F. 897 685
Stable cation-active plastic dispersions and a process for their production. Badische Anilin- & Soda-Fabrik AG. 897 804
Pharmaceutical and veterinary anthelmintic composition comprising 2-thienylmethyl-2-imidazolyl sulphide and acid addition salts. Pfizer Co., Inc., Chas. 897 805
Polymerisation process. Polymer Corporation Ltd. 897 472
Oil extension of rubbery copolymers of ethylene and propylene. Hercules Powder Co. 897 807
Palladium catalyst for liquid phase combination of hydrogen and oxygen. United States Atomic Energy Commission. 897 808
Method and apparatus for the manufacture of 2,2'-dipyridyl. Imperial Chemical Industries of Australia & New Zealand Ltd. 897 473
Process for cross-linking ethylene polymers and composition for use therein. Grace & Co., W. R. 897 605
Preparation of resins. Pfizer & Co. Inc., Chas. 897 839
Working up of low-pressure polyolefin dispersions. Chemische Werke Hüls AG. 897 474
Process for activating alkali metal catalysts. Shell Internationale Research Maatschappij NV. 897 843
Production of polyamides. Rhone-Poulenc. 897 624
Process for the production of impact-resistant polystyrene. Chemische Werke Hüls AG. 897 625
Anthraquinone dyestuffs and process for their manufacture. Ciba Ltd. [Divided out of 897 487.] 897 488, 897 489
Preparation of β,β -pentamethylene butyrolactone. Warner-Lambert Pharmaceutical Co. [Divided out of 897 930.] 897 931

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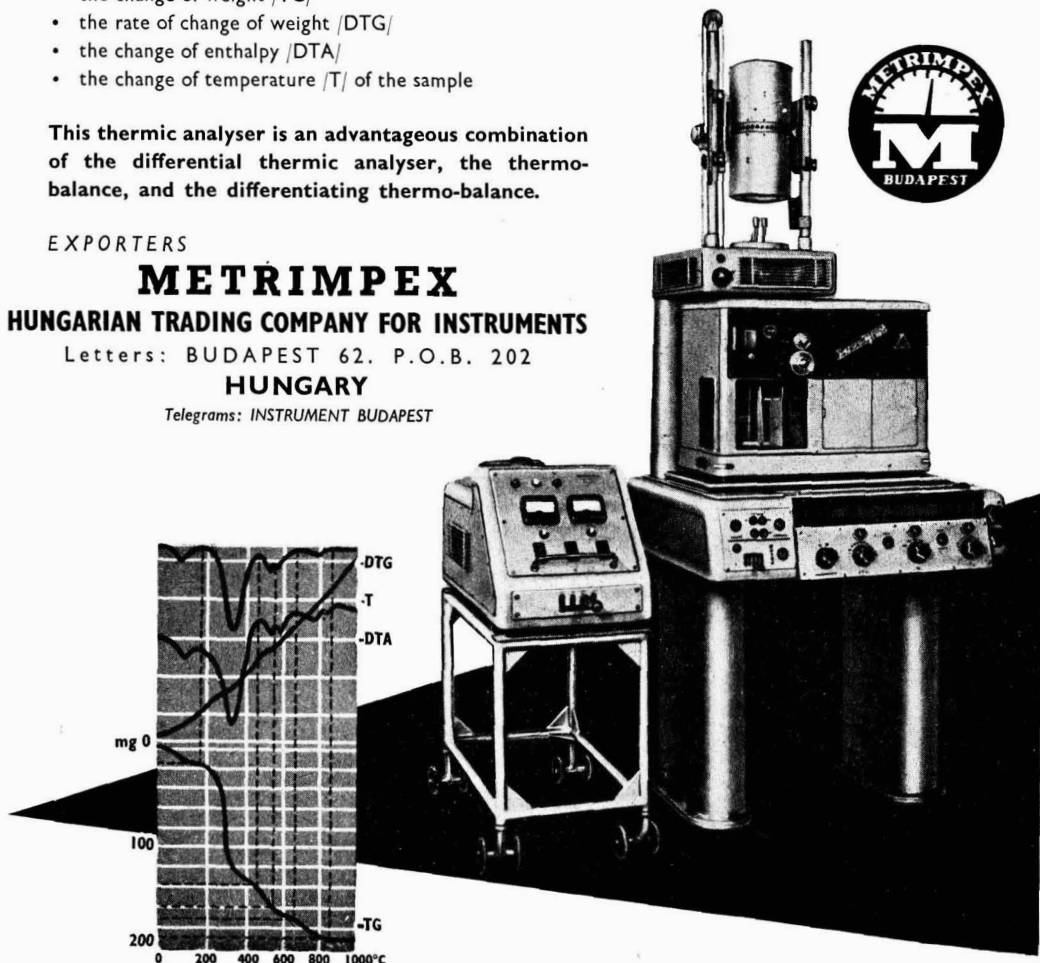
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Details of those exhibits about which
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*A 200 gallon steam-jacketed pan with 4 speed counter-rotating agitator.
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*Manufacturing Chemists' Process Plant.
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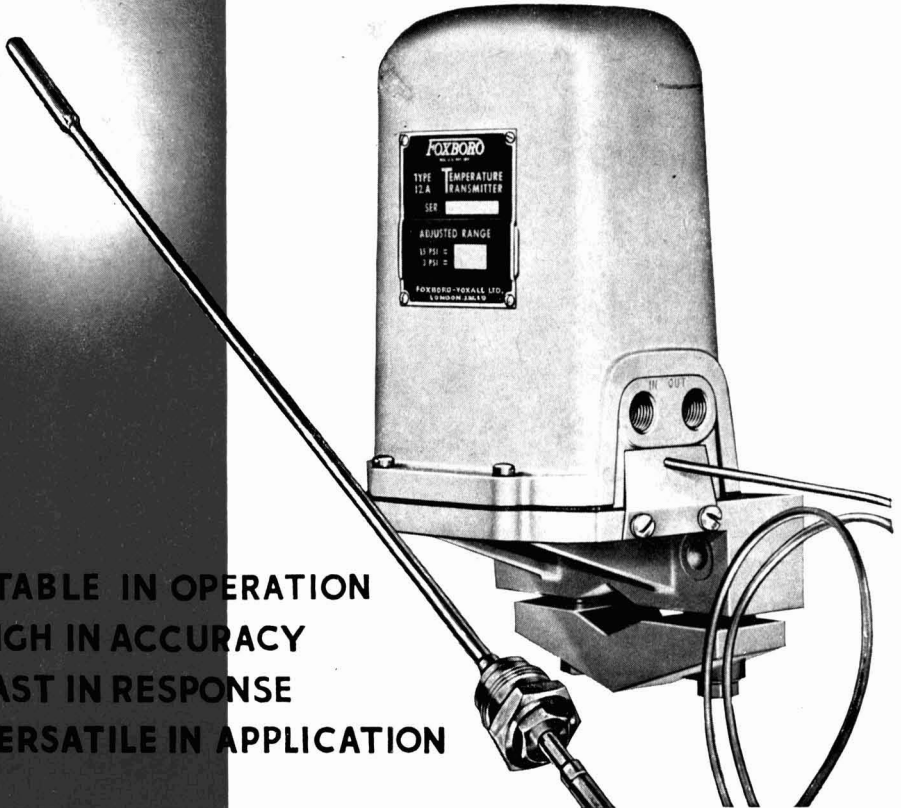
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