The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. LIII
No 1370

SATURDAY, SEPTEMBER 29, 1945
REGISTERED AS A NEWSPAPER

6D. PER COPY
POST FREE 8D.

Control temperature and SAVE HEAT

Sound, heat-saving suggestions

There are two main ways of saving heat—and fuel : (1) don't apply to a job any more heat than it needs, and (2) prevent heat from getting away unused. • The solution for (1) is often thermostatic control, and for (2) proper insulation of all hot surfaces.
On both subjects first-class advice is given in the following Bulletins written by experts for your help and guidance :

THERMOSTATIC CONTROL FOR HOT WATER AND STEAM (*Bulletin No.* 11)

Describes the various methods of automatic temperature control and their application in central heating, hot water supply, process heating, engine cooling (and waste heat recovery), steam production. For the best results in fuel saving, correct choice of the control method for the particular purpose is essential. The Bulletin will guide you in making that choice.

THERMAL INSULATION OF BUILDINGS (*Bulletin No.* 12)

Here, in condensed form, is a complete guide to the insulation of rooms and buildings to prevent excessive loss of heat.

HEAT INSULATION (LAGGING) (*Bulletin No.* 2)

A concise reference-book on lagging materials and the effective heat insulation of steam and hot-water pipes, boilers, economisers, calorifiers, cylinders and steam chests and other steam spaces.

INSULATION OF FURNACES (*Bulletin No.* 17)

The loss of heat from an uninsulated, or badly insulated, furnace may be more than 20%. Proper insulation may reduce this loss to less than 5%, resulting in a fuel saving of 15%.

THESE BULLETINS are in every sense practical. They provide specialist information for the managing executive and the man on the job. Copies are free from your Regional Office of the Ministry of Fuel and Power.

ISSUED BY THE MINISTRY OF FUEL AND POWER

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

BOUVERIE HOUSE, 154 FLEET STREET, LONDON, E.C.4

Telegrams: ALLANGAS FLEET LONDON — Telephone: CENTRAL 3212 (10 lines)
GLASGOW: 116 Hope Street (Central 3970) — BIRMINGHAM: Daimler House, Paradise Street (Midland 0784-5)

THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers Limited

VOL. LIII
No. 1370

September 29, 1945

Annual Subscription 21s.
Overseas 26s.

National Control and Efficiency

WITH the return to power of a Labour Government the country is evidently faced with reorganisation of some of its major industries and possibly with increased Government control of the remainder. There has been a good deal of loose talk about what is meant by nationalisation and also regarding the position of industry as it exists at the moment. The talk is encouraged by the fact that the Government has not yet declared exactly what it proposes to do.

There is a freely expressed opinion from the Labour Party side that British industry is inefficient. Some surprising channels for expression of this opinion are being used. Thus, the latest issue of the *Board of Trade Journal* contains articles based on Sir Stafford Cripps's recent speeches in support of a plan to reorganise the cotton industry, and in the course of the article there occurs the following passage: "For a great many years manufacturers were obsessed by the theory that private enterprise should be left to its own devices until it called in the Government to assist it. . . . In the result, even before the war, many of our industries were hopelessly behind their overseas rivals, and that position has during six years of war grown steadily worse—with the exception of the engineering industry, which the Government did so much to develop during the war. Now this static stage of inefficiency . . . ."—and so on. It is a matter of serious consequence that for the first time the *Board of Trade Journal* is found making controversial statements coupled with strong criticisms of industry. It may cut no ice at home; but it can do considerable harm in our export markets.

There is also the attitude of labour. The New York Correspondent of *The Times* writes of "the obvious determination of organised labour (*i.e.*, in U.S.A.) to secure for itself a larger share than ever before of the national income, with almost contemptuous disregard for the interest and well-being of the rest of the community." We trust that it will not be possible to write these words of British labour, but that remains to be seen. One suspects that the vote of labour for nationalisation is not unalloyed by hope of benefits to come.

Amid these jarring voices it is necessary to preserve some clear conception of the issues at stake. The nation is committed to a policy of

On Other Pages

"nationalisation" (whatever that may mean) with increased Government control generally. Inescapable economic facts have also committed the nation to the importation of large quantities of food and raw materials. Without imports on a large scale this country with its present population could not hope to maintain even its present rather miserable standard of living; it could never get back to the standard of living obtaining before the war. In addition, the Government is committed by its political promises to vast schemes of social reform which in turn involve expenditure on a very large scale. It is also committed to finding employment for everyone who wishes to work. *These commitments cannot be successfully fulfilled unless British industry is prosperous.* There can be no robbing of hen-roosts! While we do not accept the statement that British industry is basically inefficient—its war production record gives the lie to any such charge—it is generally accepted that a great deal of reorganisation is necessary. Plant is worn out and must be replaced. Obselete plant has had to be retained in service beyond its time. New methods are necessary to meet new conditions.

British industry has itself taken the lead in this reorganisation. The coal industry and the gas industry have formulated their plans. The electricity industry reorganised itself some years ago under the Central Electricity Board. The iron and steel industry has announced far-reaching schemes of development with an expenditure of £100,000,000 and with a complete reorganisation of the British Iron and Steel Federation. The rubber industry has formulated its own scheme for rehabilitation and has undertaken the financial risks involved—and so the tale could be told of other industries. British industry is fully alive to the need for reorganisation and is proceeding with that organisation on the grand scale.

We shall be faced with competition from abroad. Mr. Donald Nelson, lately Chairman of the U.S.A. Production Board, writing in *Collier's* on May 12 last, pointed out that the U.S.A. must almost double its national income for full utilisation of its facilities and resources, and he added: "Obviously, we cannot do that from inner expansion of trade alone; we shall need to export on a huge scale. . . . The home market is fairly well saturated. Therefore we must export." This attitude is paralleled by that of other countries and undoubtedly, as European and other nations that have been ravaged by war get into their stride, so they will endeavour by export trade to recover their lost wealth. Only if British industry is really efficient can Britain survive in a highly competitive world.

The Government, to do it justice, appears to be fully aware of this fact. Mr. Herbert Morrison has said (*c.f. The Times*, September 6) that the only way of providing better benefits under the social insurance measures, or reducing taxation, and of providing more of the good things of life for everyone is by increasing the total national income. "This," he added, "can only be done by thought, work, drive, and initiative." The way in which the Government intends to bring this about is by making certain important basic industries as efficient as possible. Then he added this revealing passage: "Nationalisation is no magic cure and is not an end in itself; it provides the conditions and the opportunity. The test of success is whether those industries will be better run; whether they will show a steady increase in technical efficiency and public spirit from the top to the bottom."

The coal industry is to be nationalised, and it appears likely that the fuel industries generally will be brought more closely under Government control. It cannot by any stretch of the imagination be considered desirable for any of these industries to be simply converted to Government ownership and administered by the Civil Service. We cannot see that there is any possibility of increased efficiency that way. Past experience does not encourage us to associate initiative and enterprise with the Civil Service. We cannot believe that that is the way in which the present Government proposes to reorganise industry. It is obviously necessary to retain in key positions in industry the business men, the technical men, and all those others engaged in finance, administration, patents, and so forth, who understand and have had experience of their respective trades and

professions. We can conceive that a planning committee able to review an industry from top to bottom, with power to compel individual firms to take measures which are generally agreed to be desirable for increasing efficiency or reducing costs of production, might bring with it considerable advantages. We can conceive the possibility of increased efficiency in certain older-established industries through a Corporation responsible to the Government and able to call for Government assistance if it is required. The Central Electricity Board is a good example of the sort of thing we have in mind. Within that limited sphere "nationalisation" might prove advantageous. The proof of the pudding is in the eating, and we shall await both the Government's plans and the results of those plans as seen in industry. But let there be no mistake about it. If the measures which are proposed increase costs of production or in any way weaken the competitive power of this country in export markets, if they stifle initiative and technical progress, nationalisation, whatever form it may take, will have failed. It will have failed because it will put this country into an economic position so disastrous that we shall be deeper in the mire than we were during the worse depression after the last war.

NOTES AND COMMENTS

Scientific Civil Service

"THE Government have decided that the Scientific Civil Service is to be reorganised." That is the first sentence of a recently-issued White Paper (Cmd. 6679; H.M.S.O., 3d.) and, couched though it is in "Civil Service grammar," it indicates the first step towards a reform which we have been urging for years in these columns. Under the last Government a small Treasury Committee was set up to undertake a survey of the remuneration and conditions of service of Government scientists. The chairman was Sir Alan Barlow, of the Treasury, and the other members were Sir Edward Appleton, secretary of the D.S.I.R., Mr. W. F. Lutyens, of I.C.I., and Professor E. K. Rideal, of Cambridge University, now president of the Society of Chemical Industry. Most of the Barlow Committee's proposals are incorporated in the present White Paper, but the Government claims to have carried the proposals for the reorganisation of the Scientific Civil Service a good deal further than the Committee was able to do.

Interdepartmental Panel

A BASIC recommendation of the Committee, before details of remuneration were considered, was the establishment of a panel to maintain a uniform standard for advancement of scientific officers throughout Government departments, and this panel is to be set up very shortly, Sir Edward Appleton having agreed to serve as its chairman. It is expected that leading scientists from other departments will become members, along with representatives of administrative staffs. Recruitment to the Government Scientific Service is to be in the hands of the Civil Service Commissioners; it is reported that they have appointed Dr. C. P. Snow, Fellow of Christ's College, Cambridge (who has done much good work on the Central Register) to assist them. The Government, says the White Paper, is "resolved that the conditions of service for scientists working for the Government shall be such as to attract into the Civil Service scientifically qualified men and women of high calibre" in order that they "may play their full part in the development of the nation's resources and the promotion of the nation's well-being." Before considering the sordid details of cash remuneration, we would say "and about time, too!" The value of the services in war of the scientists employed by Government have been brought most forcibly to the attention of the public by the revelations of the wonders of Radar, "Lily," "Pluto," and what not—not to mention the atomic bomb—and, as usual, it is public opinion, not any virtue of the part of the Government, that has forced the issue.

Payment for Scientists

WHAT, in fact, do the new scales of payment amount to? To begin at the top, the salary of the Permanent Secretary of the D.S.I.R. becomes £3500, and there will be two or three posts at £2250 and £2500 (less in the provinces). Chief Scientific Officers will get £2000, Deputy Chiefs £1600-£1800, Senior Principals £1200-£1400, Principals £800-£1100, Seniors £550-£750, and plain Scientific Officers (probationary) £275-£500 (£400 on confirmation of appointment). Appointments in the provinces are on a slightly reduced salary scale, and, of course, the good old stand-by of paying women less than men for the same work—that mainstay of Civil Service practice—still holds good. One sound principle, however, is to be applied throughout the Service: special provision will be made for recruiting, above the normal minimum salary, University graduates with research qualifications, a provision that has only nominally been in force hitherto, and was conveniently ignored by the more niggardly departments.

The "Inferiority Complex"

NEW "Experimental Officers," replacing the old "Scientific Assistants" are to be recruited partly from the 18-19 age-groups of boys and girls who have specialised in scientific subjects, and partly from university graduates and "persons with experience in industry and engineering." Salaries here will range from £150 to £800, with provision for promotion to the Scientific Officer class. Some little foresight has been shown by arranging for almost all Scientific Officers to come under the Federated Superannuation Scheme for Universities, in order that pension arrangements may not be a barrier to interchange of staff with the universities. A statement by the Institution of Professional Civil Servants says, of the proposals: "In spite of the improvements, the new scheme retains the conception, stubbornly adhered to by the Treasury, that the scientist is inferior to the administrator. . . . If the present scheme is put into operation, the prospects are dismal in the extreme," and they demand a debate on the White Paper. We would content ourselves with the reserved opinion, "So far, so good."

The London Conference

IT would be folly to pretend that the conference of the Foreign Secretaries of the "Big Five" has been a success. While the question of making a treaty with Italy has been passed on to the deputies, it has not been found possible to have recourse even to this stop-gap measure as regards treaties with Germany's former satellites in South-Eastern Europe, or with Finland. Failure has also to be registered over the internationalisation of Europe's inland waterways, and about food for Austria. That not even subsidiary questions—never mind such major problems as long-term plans for Germany, or an international régime for the Ruhr—have been brought nearer to solution, is due partly to the failure to explore them sufficiently before the Foreign Secretaries met. However, there is growing evidence that the war-time cohesion between Great Britain, the U.S.S.R., and the U.S.A., has given way to a preoccupation with the establishment of so-called "Blocks." It is not yet too late to call a halt to this development which seriously threatens to nullify the hard lesson of 1939-45.

Silicon Iron Castings

New "Services" Specification

THE British Standards Institution has just issued for the Ministry of Supply (S.T.A.M.) a further specification for high-silicon iron castings; it has the reference No. STA/25. This specification includes details of the chemical composition of the material and also includes requirements relating to heat treatment, welding, hydraulic testing, etc. This material, which has a silicon content of approximately 14.5 per cent., is used for special pipework involving the use of acids. Standard samples for analytical purposes may be obtained from the National Physical Laboratory, Teddington, Middlesex; and copies of the specification are available from the British Standards Institution, 28 Victoria Street, S.W.2, price 6d. each.

Wholesalers' sales of industrial chemicals in the United States totalled $10,967,000 for the first six months of this year, 9 per cent. higher than for the corresponding period in 1944, according to the Bureau of Census.

Industrial Plant in Glass

War-Time Developments and Peace Prospects

by P. H. TURPIN

DEVELOPMENTS in glass-working technique have opened up a field for industrial use of glass in connection with food production and chemical manufacture hitherto limited in scale to the laboratory and the research worker. During the war the firm of Quickfit & Quartz, Ltd., has been called upon to produce a large variety of pilot and full-scale chemical plants for war purposes, ranging from production of acids and other corrosive chemicals to the latest drugs and germicides, including penicillin. Peace-time production will benefit from these developments since glass industrial plant has become available to the plant designer after being tried and proved on rigorous war service.

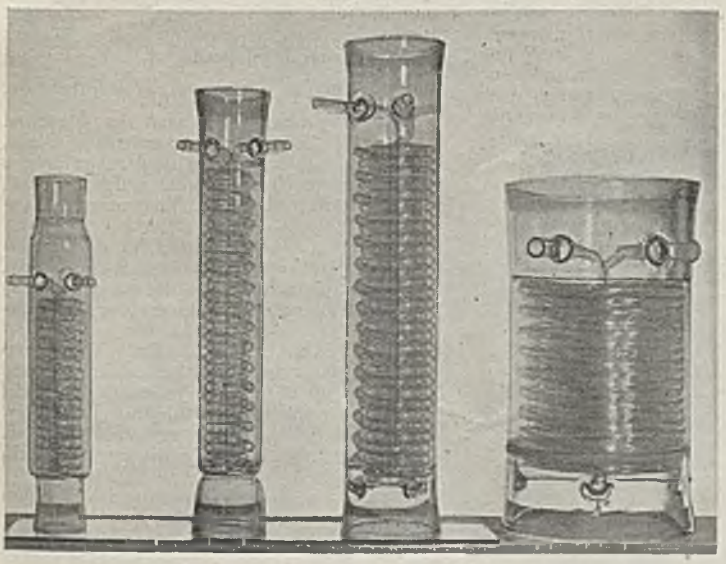


Fig. 1. Four typical condensers. Left to right: 3, 5, 15, and 25 ft. surface areas on pipe diameters of 3, 4, 6 and 12 ins.

The purpose of this article is to provide the answers to the queries likely to be raised by the prospective user of glass equipment, presenting the case for glass in the light of experience gained from an intimate contact with the development and use of glass plant from its initial small beginnings.

What is Glass?

Chemical manufacturers will ask: "*What is Glass?*" In fact, the term "glass" is used much in the same manner as "steel" to describe a wide range of materials. Glasses are generally transparent substances, being essentially super-cooled solutions of silicates and borates of aluminium, iron, calcium, sodium, potassium, etc., in silica. Glasses are prepared by heating together silica, boric acid, and the various metals in the form of salts which, by chemical reaction, combine together (at temperatures often as high as 1600°C.) to form glass with evolution of gases. The compositions of glasses are always quoted, for convenience, in terms of the oxides of the constituents found therein by analysis.

Common "soft soda" glass contains approximately 68% SiO_2, 4% Al_2O_3, 0.7% B_2O_3, 5.5% CaO, 2.2% MgO, 17% Na_2O, 2.2% K_2O, and has a linear coefficient of thermal expansion, between 0°C. and 100°C., in the region of .00001. Borosilicate glasses, commonly known as "heat-resisting glasses" and used for commercial ovenware, contain approximately 80% SiO_2, 12% B_2O_3, 2.7% Al_2O_3, 4% Na_2O, 0.06% Fe_2O_3, 0.12% CaO, and have linear coefficients of thermal expansion approximating to .000003.

In general terms, the linear coefficients of thermal expansion decrease as the silica content increases. It will be noted by the engineer that the linear coefficient of thermal expansion of the "soft soda" types of glass is similar to that of mild steel, while those of the heat-resisting glasses are only one-third that of mild steel. At the

same time the densities of borosilicate glasses are approximately one-third that of mild steel.

The glasses generally chosen for modern laboratory apparatus and industrial plant are the borosilicate glasses, including those known by the trade names of "Hysil," "Phoenix," and "Pyrex." These glasses exhibit the most satisfactory physical and chemical properties from the point of view of ability to stand up to rigorous service conditions combined with the good lamp-working properties required by the plant manufacturer. The extremely low linear thermal expansion coefficients have been instrumental in allowing glass of robust thickness to be flame-worked without breakage due to internal strain before final annealing is effected. This same feature ensures that pipes and other equipment can be flushed with cold water or detergents

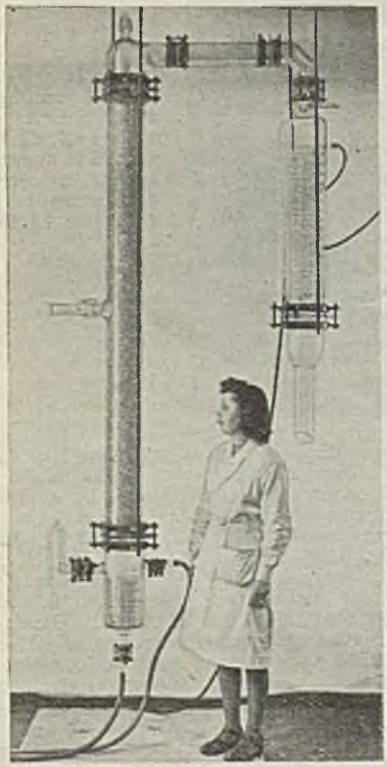


Fig. 2. Continuous still with steam-heated boiler and 15 sq. ft. condenser.

and immediately afterwards sterilised with steam.

That glass breaks no one can deny, but the fact that for generations glass has been accepted as a commercial packing for beverages, sauces, medicines, chemicals, etc., is sufficient to indicate that breakage dangers are truly small. Early in the war the production of certain vital highly corrosive chemicals was dependent upon the use of glass equipment, since no other material would stand up to the conditions. Here was an instance where any prejudices against glass had to be overcome. After overcoming step by step the difficulties of design, production, and installation, results proved the breakage risks to be grossly exaggerated. From this pioneer work on the part of both the user and Quickfit & Quartz, Ltd., the wide range of equipment manufactured by the company, and used to-day by manufacturers of many different products, has developed.

Glass Plant in Commercial Production

Glass Pipelines are used in chemical manufacture for conveying corrosive fluids, strong acids, etc., and in food manufacture for conveying fruit juices, pulps, sauces, vinegar, milk, alcoholic, and other beverages.

Glass Condensers are used for distillation or reflux of corrosive chemicals, acids, drugs, etc. Recovery of solvents often containing dissolved acids and recovery of alcohol from fermentation vats, etc.

Glass Boilers or Heat Exchangers are used for the preheating of corrosive liquors feeding to stills or vats, as evaporators on continuous stills, or for heating liquids in large batch stills. They are used as flash vaporisers and flash sterilisers of fruit juices, etc.

Glass Stills of batch or continuous types are used for production of corrosive chemicals, fine chemicals and drugs, essences and flavourings, etc., and recovery of solvents.

Glass Extractors and Scrubbing Towers are available for liquid-liquid or liquid-solid extraction, and for gas-liquid scrubbing.

Quickfit & Quartz, Ltd., have supplied glass plant in all these categories for use in connection with the war. A special feature of the "Quickfit" pipe connection system is that the backing flanges are set back from the interface joint for visual inspection of each side of the gasket. Any sign of a leak can readily be detected and the joint tightened before corrosion or rusting of the bolt occurs.

Their *Glass Condensers* (Fig. 1) are claimed to embody the first real solution to the problem of providing a plant-scale condenser in glass. The ingenious cooling-coil assembly utilises the available space to the full. High velocity of coolant through the coil ensures the minimum thickness of "stationary film," thus ensuring maximum efficiency. Smoothness of surface finish is an important factor, too, in the efficiency of glass condensers, which is rather unexpected

from considerations only of thermal conductivity. Metals score over glass for thermal conductivity, but metal tubes in condensers are seldom smooth and hold a considerable film of stationary liquid or gas as well as providing a good foundation for growth of scale. In the case of glass there is less tendency for scale growth to develop, and if formed it is readily visible so that steps may be taken for cleaning.

One example of the resistance to thermal shock from the company's records concerns the use of a 15 sq. ft. condenser situated at the top of a still. While distilling acetic acid the still, by mischance, caught fire at the base. Flames passed both around the outside and through the centre in contact with the cooling coil still circulating cold water until the rubber feed tubes were burnt away from the water connections. After the flames were extinguished the condenser was found to be intact and was put into further service.

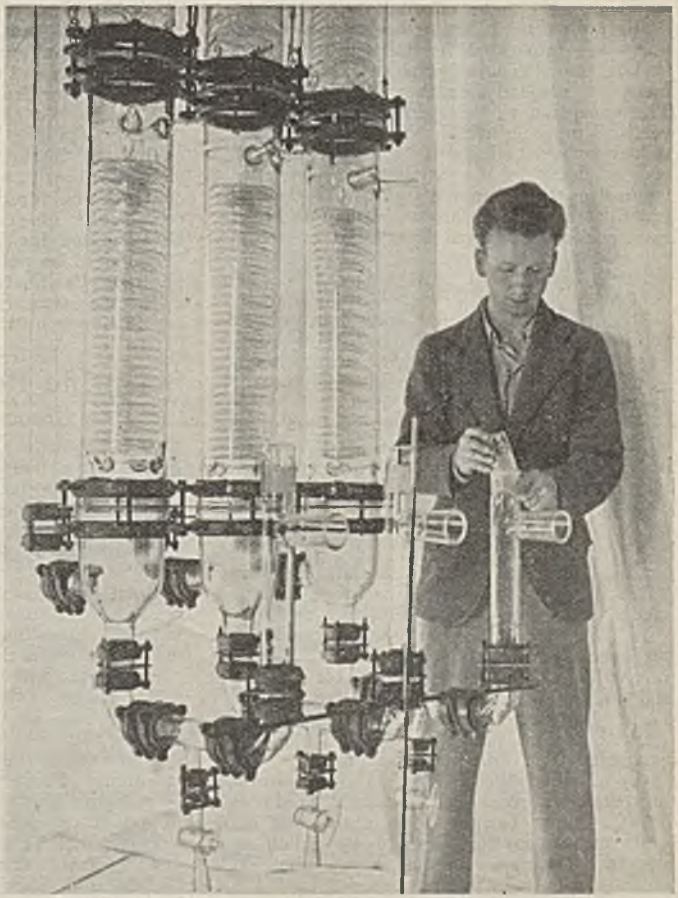


Fig. 3. Close view of the base of a scrubbing-tower unit, incorporating three towers in parallel, each containing three 15 sq. ft. heat exchanger-units.

These condensers render obsolete the old-fashioned heat exchanger banks or serpentines of glass pipeline and the coil in a water bath, as well as providing huge economies in floor space and bulk.

"Quickfit" glass boilers or heat exchangers consist of the condenser-type coil assemblies sealed into glass jackets; instead, however, of both inlet and outlet being situated at the top, the outlet is at the bottom. Thus is prevented risk of breakage due to steam hammer when steam is the heating medium employed. In the case of both boilers and condensers, the coils fracture only at pressures above 600 lb./sq. in.

Glass stills are now available in sizes of use to commercial production. Batch stills having vessels of 10, 20 and 50 gallons capacity are available with a range of fractionating columns, stillheads, and condensers. Continuous stills employ steam-heated vessels and standard column sections with small feed sections which can be built up into the appropriate lengths for stripping and rectifying. The accompanying photograph (Fig. 2) of an early continuous still has a 5 sq. ft. 6 in. boiler with a 6 ft. 6 in. diameter column, and a 15 ft. surface condenser. The column with central in-feed is now superseded by the sectional column described above.

Glass extractors and scrubbing towers are made for a variety of purposes including extraction of solids and liquids with light or heavy solvents. The illustrated scrubbing towers (Fig. 3) are used for extraction of hydrochloric acid from an organic gas. In this instance, "Quickfit"

condensing sections are employed as packed columns. With coolant circulating through the coils, heat of solution of hydrochloric acid in water is removed, enabling recovery of strong acid to be effected.

Glass pipeline is simple to instal since all parts are fabricated in the works to close limits. As a general principle glass equipment is suspended rather than clamped. The exception to this principle is the long vertical pipeline which should be gripped in rubber-inserted clamps in order that its weight shall not be carried by horizontal connecting pipes or equipment. Horizontal pipelines are supported on adjustable hanging brackets protected by rubber or asbestos wrapping.

Large heavy plant units such as columns, condensers, etc., are suspended either by rods through the flange bolt holes or by counterbalance methods. The 12 in. backing flange is provided with three hemispherical recesses so that counterbalance or adjustable screws may be used.

It is often necessary to connect glass pipes to metal pipes, vitreous enamelled vessels, and valves. For this purpose are provided metal backing flanges drilled to suit British Standard pipe flanges.

Service Conditions

Glass chemical plant is manufactured to withstand the following conditions in service:

(a) *Pressure*: Normal maximum working pressure up to 4 in. diameter, 100 lb./sq. in.; 60 lb./sq. in. for 6 in. diameter; 20 lb./sq. in for 9 in. diameter; 10 lb./sq. in. for 12 in. diameter. Higher pressures can be worked at for special requirements by arrangement with the manufacturer.

(b) *Temperature*: The maximum working temperature can be considered as 300°C. For temperatures above 150°C., however, precautions should be taken to prevent excessive thermal shock such as chilling with rain or snow.

(c) *Vibration*: Pipeline should withstand all normal pump and machinery vibrations. When connecting glass pipes to vibrating machinery, rigid support should not be made within approximately 10 ft. of the vibrating equipment. Precaution should be taken to avoid "water hammer."

(d) *Chemical Resistance*: Glass is suitable for use with all acids with the exceptions of hydrofluoric and hot concentrated phosphoric acids. Glass may be used successfully with dilute alkalis, but is attacked by hot strong caustic solutions.

Outstanding advantages of industrial plant in glass may be listed as follows:

(a) *Resistance to Corrosion*: Glass eliminates corrosion and its resultant maintenance costs. The efficiency of condensers and heat exchangers remains unimpaired, since no surface roughness develops as with metal. Glass is entirely resistant to acid and corrosive chlor-bodies, with the exception only of hydrofluoric and hot concentrated phosphoric acids.

(b) *Purity*: Glass enables laboratory conditions of purity and cleanliness to be maintained on production scale. That the plant is clean at the start of production and at change-over from one process to another can be ensured by visual inspection.

(c) *Visibility*: The transparency of glass equipment enables plant control to be effected visually, as in the laboratory, while contents and internal processes may always be visually observed. Food products may be examined for colour and clarity.

It should be pointed out, finally, that the photographs illustrating this article are of apparatus assembled in the works for checking purposes only.

Scientific Research Workers

Grants to Students

IN addition to the White Paper recommending a reorganisation of the Scientific Civil Service (reviewed in our editorial comments), another White Paper was issued last week detailing grants and allowances to be made by the D.S.I.R. to research workers and students. The Advisory Council has designed a scheme to meet the need for a larger number of trained scientific investigators for Government and industrial research.

Payments will be of three kinds: (1) Maintenance allowances for qualified students who are unable to get from other sources the cost of maintenance and training to enable them to undergo training in research. These allowances are restricted to students who intend to take up a career in which research work will be of value.

There will be payment of approved fees and a grant from the following scale: Oxford and Cambridge students living at home, £180; students in lodgings or at a college or hostel, £260. London, £180, £250. Other universities, £180, £220. It is considered desirable that students should undertake a certain amount of teaching work.

(2) Senior research awards, tenable at any institution in Britain approved by the Advisory Council, will not normally exceed £400 per annum, plus approved fees for two, and in certain cases, three years.

(3) Grants for the development of special researches. Applications will be considered from investigators of acknowledged standing for researches "of exceptional timeliness and promise" in which they themselves are personally engaged. These grants will enable investigators to employ a scientific laboratory or clerical assistant, to purchase special equipment or material, or for any other approved purpose.

Social Security for Chemists

Accusations of "Apathy" in the Profession

AN open meeting to discuss social security for chemists was held at the Royal Empire Society, Northumberland Avenue, London, on September 19. It was organised by the London Section of the B.A.C., and Mr. E. L. Holmes, chairman of the section, occupied the chair.

Opening the meeting, Mr. Holmes said the whole question of social security had been exercising the minds of many chemists for a large number of years, and his committee was hoping, as the result of this meeting, to obtain views and information which would enable it to take some action in the matter.

Mr. Norman Sheldon, hon. secretary of the section, said it was becoming notorious that professional men who had fixed salaries were most neglected by, and suffered most at the hands of, the State. Scientists as a whole, and chemists in particular, were the worst paid of all professions, and with certain exceptions their reward bore no relation to the importance of their work. They were heavily taxed, they struggled to maintain a high standard of living, and if they were unfortunate they received no more assistance from the State than the lowest-paid wage-earner.

Three Vital Questions

He asked the following three questions: (1) How many members of that audience were satisfied that they could face a period of unemployment without grave financial embarrassment and a serious temptation to accept a new appointment with inadequate remuneration? (2) How many were satisfied that they or their families would be adequately provided for if their careers came to an untimely end by illness or death? (3) How many of them really cared enough about these matters to do anything at all about it?

The B.A.C. was formed in 1917 to look after the economic interests of the chemist, and when it became clear that some scheme of financial assistance was necessary, an unemployment fund was started, but the scheme was weakened by lack of support from chemists themselves. The contributions to the unemployment fund had a very low average. Some chemists said they could not afford more and others said they were in good jobs and did not need it; they were not likely to be unemployed, and so on. In his view, these were not sound reasons, and when a man said he could not afford it he had no understanding of finance, and it was no wonder that chemists did not make progress financially. What he wanted to see was a fund which, after allowing for the State fund, would yield from £5 to £12 per week according to the age and position of the member, and payments for life to those who were totally incapacitated from earning a living.

The Royal Institute of Chemistry Benevolent Fund did valuable work in looking after some who fell on evil days, but its funds were far too small and its scope too limited. Much of its work should be covered by a comprehensive scheme. Assuming an average unemployment of 2½ per cent.—admittedly a high figure—the fund might have to pay £4 per week to 25 out of every 1000 members for six months, or about £2500 per annum—equal to £2 10s. per member, or £3 if allowance were made for expenses. With £2 per week from the State, the insurance against unemployment became an average of £6 per week. Sickness and accident benefits could be added, and for a sum of £10 per annum something really useful could be done covering nearly all the work carried out by the B.A.C. fund and the R.I.C. fund, and doing it much better. These figures were obviously rough, but there was no time to go into details.

The real problem was, "Can we expect chemists to co-operate?" Experience had shown that chemists as a whole were either too selfish or too apathetic to do anything, but that must not be allowed to continue. Superannuation, too, might well be arranged in co-operation with other professional workers. A plan of social security based on the ideas he had outlined would give chemists a financial background which would eliminate many worries and enable them to make greater progress as individuals.

More State Funds Required

Lord Strabolgi emphasised that the salaries of scientific workers should be such as to give them freedom from anxiety and also to attract the best brains in the country. The Government itself must be prepared to spend much more in the future upon scientific research; at the same time he paid a tribute to the good work done by commercial undertakings in the allocation of large sums for this purpose, though naturally they wished to keep the results to themselves. Therefore, he hoped there would be more Government funds for scientific research with the results available to all. The scheme outlined by Mr. Sheldon could only be achieved by co-operation which, however, seemed a rather unpopular line to take with the ordinary professional body—unless they were lawyers or doctors.

Mr. Birchall, speaking on behalf of the members of the St. Helens Section of the

B.A.C., said that a national scheme would not meet the needs of the professional man and some supplementary alternative method would have to be adopted. Any scheme organised by the combined bodies of chemists must provide for all, and must include what might be called unqualified people, such as laboratory assistants and others. If such a scheme could not be formulated at once, then he would like to see arrangements by which if a man left one employer to go to another the benefits which the one firm might be giving should be carried over to and continued by the second firm.

New Sub-Committee Formed

Mr. G. S. Gurr (chairman of the unemployment fund of the B.A.C.) said that although the Association had made considerable progress with regard to unemployment, it was necessary to consider what more could be done. Having regard to the strong financial position of the unemployment fund, there was no need for members to panic into the first ill-paid offer that came along. There was a reserve of £36,000, and, even if 10 per cent. of the membership became unemployed, the reserve fund would only be called upon to find £5000 or £6000 to meet the deficiency in annual revenue to provide benefits at the standard scale for six months. The two further possibilities were either to reduce the subscription to the fund or to increase the benefits, and various views had been put forward which called for close consideration. Moreover, suggestions had been made that there should be undertaken for chemists superannuation, health insurance, funeral expenses, etc. Whether these were practicable or permissible under existing legislation governing insurance activites or, when the Government's social security scheme became law, required investigation, and the Association had formed a social security sub-committee to deal with these matters. His contention was that social security for chemists was the business of the B.A.C., which had proved its ability to carry such services into successful practice.

Mr. J. Stewart Cook (organising secretary of the B.A.C.) suggested that some other use should be made of the large sum in hand. The new social security sub-committee would have the advantage of Sir William Beveridge as honorary consultant. There would also have to be greater co-operation with other bodies concerned with chemistry and chemical industry.

Mr. White (treasurer of the R.I.C. Benevolent Fund) complained of the feeling of the younger chemists in regard to social security hitherto, and their belief that the older members of the industry did not care about the welfare of the younger members. There never was a more untrue statement. Not only did the various professional bodies take the greatest interest in the younger members, but the administrations of large works spent a great deal of time and thought on the matter. Chemists themselves were largely to blame for the present unsatisfactory position, and he regarded all unemployment schemes, etc., merely as palliatives. What was wanted was an antidote to the colossal ignorance on the part of a small proportion of employers in regard to social security generally. They would have to be educated, as would the Government and the Press, as well as the general public, concerning the real value of the scientist in general, and the chemist in particular, in the affairs of the nation. Further, the various bodies concerned with chemistry and chemical industry must abandon their parochial outlook and co-operate much more closely.

More Co-operation Needed

Mr. J. L. Sweeten urged that all chemists, no matter to what professional society they belonged, should get together and form an insurance company of their own and undertake all forms of insurance from unemployment to fire. He himself had made provision in these matters with insurance companies, but would be quite prepared to transfer all his business to such a new company. Mr. Whitney urged that some council should be formed to decide on minimum salaries for the various grades of chemist, and to take steps to see that journals catering for chemists would not publish advertisements which did not comply with these minimum requirements. Other speakers favoured greater co-operation between the various bodies concerned, and one suggestion was the formation of a friendly society which could be joined by every chemist no matter to what professional body he belonged. This friendly society should be a non-profit-making concern run by the B.A.C., the R.I.C., the A.Sc.W., and other bodies. Mr. David Roe, speaking as a member of the Council of the O.C.C.A., said that, so far as he was aware, no approach had ever been made to that Association to co-operate, although any such approach would be sympathetically considered by his Council.

The chairman, summing up, said it was quite clear there were men available who would be most valuable on any committee dealing with the problem. From that point of view alone, the time taken up by the discussion had not been wasted. The necessary spade work was colossal and the assistance and help of some of those who had spoken would be invaluable. Therefore, he asked all those present to go away with the thought in their mind of what they could do to help.

DDT

From War to Peace

ON the sixth anniversary of the outbreak of war, the B.B.C. announced that limited quantities of DDT were being released for civilian purposes. Up to that moment, DDT had been one of the nation's foremost war priorities. It was not until August 2, 1944, that the story of DDT had been officially released in this country. This story told of the efforts of scientists, technologists, and industrialists, all over the free world to make and apply the new insecticide. And how did it all begin? Like so much else in modern chemical achievement, DDT arose from years of systematic research, carried out, in this case, in the laboratories of J. R. Geigy S.A., of Basle.

During the last twenty years the company, closely associated as it is with the textile industry, has been engaged on a research programme into moth-proofing agents, leading to the publication, in a Swiss chemical journal, of the intensive work directed by Drs. Läuger, Martin and Müller.

Discovery of Mitin

The Geigy laboratories have been working on dyestuff chemistry for the past hundred odd years, and the experience of the dyestuff chemist was freely drawn upon. It was early realised that what was wanted must be toxic to the moth larva, but it must also impart a permanent toxicity to the wool. The substance must, therefore, be a colourless dye with good affinity for the wool fibre, good fastness to light, washing and milling—the usual wet fastness properties. Moreover, it must also be harmless to warm-blooded animals, especially human beings, and have no offensive odour. This work led to the discovery of Mitin, a product suitable for the treatment of wool as a permanent moth-proofer, and it was natural to extend the study by chemical synthesis to a search for a general insecticide.

The research was, therefore, made more general and a wider range of substances was investigated on other insects. Much was learned from the examination of natural insecticides, such as the vulpinic acid of certain lichens (*Cetrania vulpina*), rotenone, pyrethrum, cumarin derivatives, etc., but they all failed to come up to specification because they were easily destroyed by light.

It was also evident that species of insects which consume a more varied diet, such as green leaves, stalks, fruit, etc., must possess a more varied system of digestive ferments than the keratin eaters (moths), and they will be more easily effected by poisonous substances, for one has only to attack certain of these ferments, and it was in the section of research work carried out by Dr. P. Müller, with species of insects other than moths, that the latest chapter really began. Arising out of the above collaboration between organic synthesis and biological analysis of the contract poison process, there emerged a compound which, as it later turned out, was already known, and had already shown good effects. This compound was diphenyl-trichloro-ethane. From this basis another substance of this group was prepared—αα-dichloro-diphenyl-βββ-trichloroethane—which showed an insecticidal effect never hitherto observed in a synthetic substance. This was DDT.

The Colorado Beetle

Dr. Paul Müller tested DDT against the Colorado beetle by sprinkling a dust preparation on a potato plant which was infested and noticed that almost immediately the larvae dropped to the ground. He then took up a handful of soil, which he carried into the laboratory; next morning he found that all the larvae were dead. He reasoned that as they had dropped from the foliage immediately, they had not had time to eat any part of the plant containing DDT, so that they must have died by mere contact with the powder.

In this way, the contact effect of DDT was discovered. This story is of particular interest, as the direct application of DDT to large-scale field work was first made in Switzerland against the Colorado beetle, and in 1940, when pyrethrum and derris were unobtainable, it saved the Swiss potato crop from a particularly serious infestation.

In 1942, the Geigy company contacted the British Legation in Berne to communicate to them the interesting results obtained to date with DDT which, at that time, was referred to under the Geigy trade names of *Gesarol* and *Neocid*, the former referring to agricultural applications, and the latter to medical preparations against parasites, such as the louse, and the mosquito. The Geigy company in Manchester also introduced the material to the chief United Kingdom testing stations, both agricultural and medical.

However, before an insecticide can be used on a large scale a great deal has to be known not only about its lethal power and its methods of application and the strength in which it should be applied, but also about the danger to health which may attend its use. The early laboratory tests carried out in England by groups of chemists, entomologists, and other scientists, concentrated the work of several years into a slightly higher number of weeks.

Of the many materials, natural or

synthetic, which up to 1942 had been tested for their toxic effect on mosquitos and flies, pyrethrum flowers had proved to be by far the most effective. In the period immediately preceding the war, world production of pyrethrum flowers was approximately 15,000 tons per annum, of which 70 per cent. was grown in Japan. Kenya began commercial production in 1933, and by 1938 was producing 2000 tons yearly of high quality flowers. America was by far the largest consumer, and practically the whole of the Kenya crop was shipped to that country for the extraction of their physiologically active ingredients, the pyrethrins. With the entrance of Japan into the war the supplies of both pyrethrum and rotenone, another important insecticide, were cut off, while the total demand for the Armed Forces of the Allied Nations rapidly increased.

Insecticide Panel

Immediate means of improving the position had to be found and, as one of the steps, the Ministry of Production, during the winter of 1942, set up an Insecticide Development Panel under the chairmanship of Professor I. M. Heilbron, F.R.S.

After having examined all synthetic insecticides available, the panel chose DDT for three essential reasons: its effectiveness as an insecticide, its harmlessness to human beings and warm-blooded animals, and for the fact that it could be manufactured from raw materials available in the U.K.

Pilot scale production was immediately commenced, and in collaboration with the British Geigy Company, plans for larger scale production were entered into. Its full potentialities and methods of application were simultaneously worked out by teams of Government, University, and industrial scientists, in collaboration with experts from the three Services. Close liaison was established with American and Dominion scientists, who were already working on similar lines, and many hundreds of workers are now collaborating in the development of all aspects of its use and application.

Bulk production was soon inaugurated and as Service demands increased, plans were made for a further expansion. Service demands are still high and take first priority, so that only limited quantites of DDT can as yet be made available for the numerous uses which it will have in every-day life.

It may be of interest to state that at the occasion of his visit to Normandy, Mr. Churchill was so impressed with the importance of DDT, that he caused it to be given equal priority with penicillin.

DDT was, in the first place, used in this country for the louse-proofing of garments for the armed forces, and impregnated shirts have been issued to front-line troops since 1943. They have proved extraordinarily effective, the more so as they withstand several launderings without vital loss of activity. It is no exaggeration to say that our troops were virtually louse-free, a striking contrast to German prisoners of war who, when brought in, were generally found to be heavily infested.

Typhus at Naples

The first full-scale use of DDT in a war sector was in Naples, where, in December, 1943, typhus broke out among the overcrowded civilian population. As soon as the Allied Forces were in control, vigorous steps were taken to suppress the outbreak by mass disinfestation. This was first done by dusting with non-DDT-containing pesticides, but as soon as DDT became available, it was used solely and with signal success. During January, 1944, 1,300,000 civilians were dusted at two delousing stations (72,000 on the peak day), and within three weeks the outbreak in Naples was completely under control.

For the troops, however, protection against malaria and dysentery is even more important, and in the operations which were carried out in the Far East, DDT found its most important war use. In this theatre of war, large areas are made practically untenable by the enormous population of malaria-carrying mosquitoes. Added to oil, however, which has been used against mosquito larvae ever since the Panama Canal was built, DDT produces a larvicide of such potency that only a fraction of the oil previously employed will henceforth be required and this new preparation will remain toxic to the mosquito larvae for days afterwards.

As the quantity of DDT solution required is small, relatively large areas can be treated from the ground by means of hand or power sprayers. For larger areas, or where ready ground access is not available, spraying from aircraft has given highly significant results. In this manner, large areas have been successfully treated; the use of but ½ lb. or less of DDT per acre results in an almost complete kill of larvae, and also a very high rate of kill of adult mosquitoes, both by direct contact, and by the dramatic residual effect of the insecticide.

While the DDT spray can be applied with the familiar Flit gun, with power-operated sprays, or the new gas-operated sprays, the U.S. Army developed the Aerosol bomb which, owing to its compactness and ease of transport, renders it extremely valuable for use by front-line troops in tents, native huts, foxholes, etc.

It is fitting to quote here the statement which Mr. Churchill, as Prime Minister, made in the House of Commons on September 28, 1944: "The excellent DDT powder has been fully experimented with and found to yield astonishing results which

will certainly be used on a great scale by the British Forces in Burma, and by the American and Australian Forces in the Pacific, and indeed in all theatres."

Peace-Time Uses

The latest large-scale application of DDT took place when the Allied Armies liberated the concentration camps in Germany, such as Belsen, Buchenwald, etc.

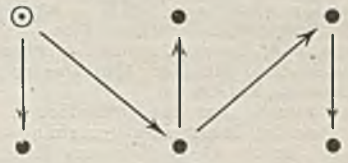
However, if the war-time uses of DDT were manifold, the peace-time uses are countless, and new fields of application are discovered every day. The control of vermin affecting man and the disinfestation of property embraces such pests as louse, the flea, the bed-bug, the cockroach, the cricket, the silver fish, not to forget the common house-fly, the carrier of so many intestinal diseases and the cause of so much loss of foodstuffs. DDT preparations can also be made up for the purpose of dusting or spraying on furnishing fabrics and carpets to protect them against moth larvae, and they can be rubbed into furs before these are put away for the summer.

In every sphere of diary farming, DDT has a wide field of application against lice, fleas, warble-flies, keds and ticks, to cite only a few, and for the disinfestation of stables, shippons, henhouses, kennels, etc.

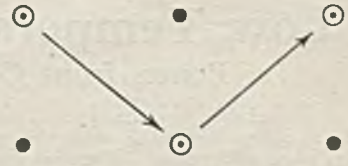
In agriculture, DDT is used against soil, root, and plant pests, such as wire-worms, carrot, onion, and cabbage root flies, as well as caterpillars, etc., and one of its greatest benefits arises in orchards and soft fruit plantations, where it is used for the control of many pests, notably the apple-blossom weevil. Among the latest developments is its application in distempers and paints. The results obtained in factory canteens with DDT oil-bound water-paint fully justifies the immense work done both in laboratory and in laboratory-field experiments. The social implications of these findings need no stressing. Great improvements have been brought within easy grasp of such industrial undertakings as jam, biscuit and sweet factories, to mention only a few. Moreover, quite apart from their use in disinfestation, these paints create new hygenic conditions, in which insects would be unable to settle and multiply.

How the Poison Works

The question why DDT should be a contact poison is most difficult to answer, and it lies, of course, on the boundary region between chemistry and entomology. It is, however, a very important question to consider. Observations made were to the effect that when flies are touched with DDT solution (*Gesarol*) on one foot (*tarsus*), the tremor and spasm excitement attacks the other leg of the same pair, proceeding then to the next pair, as follows:—



Then the paralysis extends to the mouth parts and attacks the wings and the abdomen in succession—this sequence making it highly probable that the DDT is influencing the nerve endings. It has also been observed that certain butterflies discard their legs after the influence of DDT poisoning—they autotomise, or self-amputate, and this is done thus:—



(⊙ *is autotomised*)

Certain species of flies likewise autotomise their legs under DDT irritation, but not regularly, nor according to any law. Whereas the amputated leg of a healthy fly lies quite still (dead), the autotomised legs (discarded after DDT irritation) move independently for several hours. The amputated leg of a healthy fly, too, if touched with a solution of DDT in acetate or paraffin at the foot, or at the point of amputation, makes the same movements after some minutes.

DDT is not a repellent. Insects do not avoid DDT-treated surfaces, nor do they show immediate ill-effects after having come in contact with it. DDT has no immediate "knock-down" effect, but once contracted, is fatal. Its action is not reversible, and the insect cannot recover even under the best circumstances. DDT has a lasting effect, and is active for weeks or months after application, according to the method by which it is applied.

As regards the forms in which it will be marketed, DDT itself is far too concentrated to be used as an insecticide in its pure condition. It must, therefore, be compounded in the form of dusts, solutions, emulsions, etc., for application by dusting or sprinkling, spraying, painting, etc. The distribution method, therefore, is that the DDT manufacturers sell it to established insecticide manufacturers, who will put it up in the form most suitable for each application. They will give these preparations their own trade names, such as the "DDT-ane" of the Murphy Chemical Co., Ltd., and the

" Suisect " of the Hygienic Chemical Co., Ltd., so that the general public will not come across the name of " DDT " applied to these preparations themselves. Each package will, however, contain a statement on the label to the effect that this preparation contains DDT/GEIGY.

The patents for the manufacture and application of insecticides containing DDT are held by the Geigy Company Ltd., but it is the Geigy policy to grant to purchasers of DDT/GEIGY the right to use these patents so long as suitable acknowledgement is made.

Messrs. Stafford Allen & Sons, Ltd., have been appointed as distribution agents for DDT and they will sell to authentic insecticide manufacturers much in the same way as they distributed pyrethrum and rotenone before the war. It is the general policy, however, of the Geigy/Stafford Allen organisation not to enter the insecticide field themselves, but in general restrict themselves to the sale of DDT.

Geigy, however, have registered certain trade marks in the following applications.—

1. Horticultural and agricultural—*Guesarol*,
2. Medical and textile—*Neocid*,
3. Veterinary—*Neocidol*.

It is the intention of The Geigy Company to sub-licence these names to registered users, so that a product might be put on the market as: " Smith's Guesarol Dust," against the flea-beetle; or " Jones's Neocid Dust," as a louse powder; or " Brown's Neocidol Emulsion," as a sheep dip.

Low Temperature Carbonisation

Points from Colonel Bristow's Speech

IT is remarkable how many chairmen of British companies fail to seize the opportunity, when addressing the annual general meetings of their companies, of giving a full picture either of the companies' war effort or of the technological progress achieved during the war. It cannot be said that the majority of such addresses are distinguished by a lucid exposition of the economic and technical factors involved, and they contain far too little statistical information. While there are notable exceptions, such as (to mention a few only) those of I.C.I. and the Shell group, these are outstanding by their very rarity; and chairmen of companies, and those whose duty it is to assist and advise them in the compilation of their speeches, should examine closely the wealth of detail given generally in the annual reports of nine out of ten U.S. companies. For the future, a repetition of generalities will simply not do.

Happily, the address delivered by Col. W. A. Bristow, who occupied the chair at the annual general meeting of the Low Temperature Carbonisation Co., Ltd., is one of the exceptions referred to above. It should be read with the greatest attention, not only from the viewpoint of the chemist and industrialist but also from common interest in this country's well-being. Extracts from Col. Bristow's speech are given below.

The work of this company is, indeed, as he says, " an outstanding example of how private enterprise can provide public service of great value to the community in spite of the almost insuperable difficulties introduced by lack of coal and labour, and under black-out conditions."

At the beginning of the war, Col. Bristow said, the company had just put into operation the last part of a second coal-oil distillation plant and refinery, and this had operated non-stop night and day for the past six years.

Considering that the company's low temperature plant had been the first of its kind to be erected in this or any other country, the results may be regarded as a striking tribute to the knowledge and skill the company had acquired in plant design and the manufacture of new coal products. The diesel oil and petrol produced have been used mainly for essential war transport in the Midlands and have been sufficient for over 100 million miles of heavy running.

When synthetic rubber was introduced, the firm's laboratories set to work and produced a solvent for this type of material. They now had the satisfaction of knowing that no better material had been found and that it had been used on a large scale by leading manufacturers for the past two years. Orders had now been received from Allied Governments and shipments were due to commence shortly. This product is known by the name of " Lotemsol." Another material developed was " Reclamol," used in the rubber-reclaiming processes.

The linoleum industry before the war used bitumen as a part of some of its products. As an alternative, a material called " Linolene," of which large quantities had been used, was developed. Coloured mastic floors had been bonded together with another of the company's materials, called " Florastic." These floors were easily laid, wore well and could be kept clean and polished with a minimum of effort.

" We have also," the chairman continued, " been making bituminous road sur-

facing materials in which we have incorporated a synthetic bitumen called 'Lotembit' produced by a process we have invented. This 'Lotembit' also enters into the composition of several other materials developed for different purposes. Another major product is a type of cresylic creosote which contains about 35 per cent. of tar acids and is used extensively for a variety of purposes. Large quantities go to the railway companies for preserving railway sleepers, and it is also exported to India, Africa and other parts of the Empire, and to France. From this material are also made resinous bases for paints and for road and aerodrome surfacing and binding. Thousands of tons have been supplied for these purposes."

Disinfectant Products

"Our research department has been working on special high-boiling acids; they have a very high value as disinfectants and are now being marketed, in addition to our normal disinfectant products, which constitute much of the essential raw material of the British disinfectant manufacturers. Each year some seven to eight million lb. of high-grade disinfectants have been made from our acids."

In the production of phenols and cresylic acids, a remarkable success had been achieved. The oil obtained from coal by low temperature carbonisation was particularly rich in these valuable products, and from a ton of coal about eight to ten times as much could be obtained by the firm's processes than by the usual high temperature methods.

These acids were used mainly in the plastics industry and in medicine and for mineral separation by flotation processes. Large quantities had been shipped to America, and last year over 12 per cent. of the British exports to the Defense Supplies Corporation of the U.S.A. under reverse Lease-Lend had been made by the L.T.C. Total sales of tar acids to America since the war began amounted to over £300,000.

Speaking of plant extension, Col. Bristow said: "Further new materials have been evolved and it is proposed to spend up to £100,000 on plants which will make some extremely valuable products of outstanding usefulness for the home and export markets. In connection with this part of the future programme, an arrangement has been made with Messrs. Albright & Wilson, of Birmingham, one of the leading firms in the chemical industry, which will cover the manufacture and marketing of some of these new materials.

"It is extremely fortunate for the company, and indeed for the country generally, that nearly all these products so essential in war are equally necessary in peace; in fact, some of them even more so. We shall not have to spend one penny to change over from war to peace production, except to wash the black-out off the windows. And we have already received export orders for the goods of peace, instead of war supplies, for our Allies."

Wasteful Use of Coal

After having vividly described how coal by-products enter the life of men almost everywhere, Col. Bristow emphasised again that it was a major tragedy, when coal was burnt in the raw state, that valuable products were either burnt or converted into smoke, which poisons the atmosphere and blots out the vitalising rays of the sun. The export trade in coal products would be lost and much foreign material would have to be imported in order to replace the things we had so wantonly destroyed. This recklessness was bad enough before the war, when Britain was a rich nation, and coal was cheap, but now it was just daft, and that was the only word for it.

It must not be forgotten that the price of coal was now so high that it could only be compensated for and justified by its much more scientific utilisation. It should also give the miner increasing satisfaction to know that much of the valuable parts of the product of his hard work were not just being burnt for fuel or converted into poisonous smoke, but were coming back to him in the form of pleasant and useful things in his home and daily life. It could be of little satisfaction to the miner to know that 75 per cent. of the harvest of his work was often wasted in obsolete fireplaces burning raw coal.

In the course of a debate in the House of Commons on the question of smoke abatement, on March 16 last, after the then Minister, Major Lloyd George, had spoken, Mr. Emmanuel Shinwell, the present Minister, said: "If I had the power myself, I mean real power, the sort of dictatorial power one would like to assume on certain occasions in order to get something done, I would have prevented the burning of raw coal in this country. From the standpoint of health and of fuel conservation it would be one of the finest reforms in which this country had ever engaged if we could prevent the burning of coal in its raw state. This is the essential point. We should not waste our resources but use them efficiently (*Hansard*, March 16, 1945).

Those last words, "but use them efficiently," have been uttered on many occasions by the L.T.C. during the last 17 years. This was the first time, however, that they had been endorsed so fully and so firmly by the Minister.

Personal Notes

DR. CORNELIA T. SNELL has been appointed chairman of the New York section of the A.C.S., succeeding DR. R. A. BAKER.

SIR GEORGE THOMSON, F.R.S., has accepted an invitation to become president of the Junior Institution of Engineers for 1945-6. He will deliver a presidential address on Atomic Energy at his induction on December 8.

The wedding took place recently, at Buxton, of MISS NANCY M. H. HAWKINS, of Stamford, and MR. FRANK C. MOORE, assistant divisional manager of I.C.I. (Lime Division). The bride has been on the staff of the same firm for several years.

MR. JAMES CARSON has been elected to the board of Stewarts & Lloyds, Ltd., and has been appointed assistant general managing director in charge of tube production. He takes the place of MR. A. G. STEWART, now chairman and managing director.

SIR ALEXANDER FLEMING, F.R.S., who is on a tour of inspection of R.A.F. medical establishments in Italy, has been awarded an honorary degree by the University of Rome. He was also received in audience last week by the Pope, who expressed warm appreciation of the value to humanity of the discovery of penicillin.

MR. J. R. PARK, at present development manager of the Billingham Division, I.C.I., Ltd., has been appointed Director of Research and Development of the British Oxygen Co., Ltd., and its subsidiary companies, and will be taking up his duties on October 1. Mr. Park served as a member on the Chemical Research Panel under the Directorate of Tube Alloys.

Dorman, Long & Co. announce the appointment of the following four special directors: MR. G. E. CHICKEN (commercial manager, MR. J. F. PAIN (manager, bridge department), MR. F. L. SHEPHERD (operations superintendent, iron and steel works), and MR. L. SHUTTLEWORTH, M.I.Chem.E. (manager, distillation and by-products department).

DR. JOHN BAXTER, the Widnes research chemist who has been lent to the British Government by I.C.I., has returned to England after 15 months working on the development of the atomic bomb in America. He was in charge of a British chemical group at a factory in Tennessee, and two of his fellow-experts, MR. ARTHUR JONES and MR. HAROLD EVANS, have returned with him.

Arising out of the appointment of MR. J. DAVIDSON PRATT as Director and Secretary of the Association of British Chemical Manufacturers, the following additional affiliated association appointments have been made: Association of British Insecticide Manufacturers: Joint Secretaries—MR. A. J. HOLDEN and MR. W. A. WILLIAMS; British Animal Medicine Makers' & Allied Traders' Association: Secretary—MR. W. A. WILLIAMS; British Disinfectant Manufacturers' Association: Secretary—MR. W. A. WILLIAMS.

DR. HOLGER ERDTMAN, a distinguished Swedish authority on cellulose chemistry, has been appointed Professor of Organic Chemistry at the Royal Technical College, Stockholm. He took his Ph.D. degree at the college in 1934, and has been on the teaching staff since 1941. He has been working for several years in the Central Laboratory of the Cellulose Industry, and has published many papers on his subject, a translation of one of which (on the chemistry of lignin) appeared in THE CHEMICAL AGE in 1942 (*46*, 231, 243, 253).

The Lord President of the Council has appointed PROFESSOR R. P. LINSTEAD, F.R.S., to be Director of the Chemical Research Laboratory in the D.S.I.R. He will take up this appointment on October 1, 1945. Professor Linstead was formerly Firth Professor of Chemistry in the University of Sheffield and was elected, in 1939, to the Chair of Chemistry in Harvard University. During the war, he returned to Great Britain and has rendered valuable war service. In 1942 he became Deputy Director of Scientific Research in the Ministry of Supply. During the past year he was British Chairman of the Combined Intelligence Objectives Sub-Committee responsible for organising the investigation of German military scientific developments.

Obituary

The D.F.C. has been posthumously awarded to FLT.-LT. E. P. C. KIDD, a member of the staff of Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, who was killed in action over Norway last March.

MR. HUGH MACKAY, who died at Corstorphine, Edinburgh, on September 18, was lately a director of J. A. Sheriffs & Co., Ltd., manufacturing chemists, of Royston Works, Granton, Midlothian.

PROFESSOR ROSCOE GILKEY DICKINSON Professor of Physical Chemistry and acting Dean of the Graduate School of the California Institute of Technology, died on July 13, aged 51. He was well known for his researches in the fields of the determination of the structure of complex crystals by the use of X-rays, photochemistry and reaction kinetics, Raman spectroscopy of ions and gas molecules, properties of neutrons, and the use of radiotracer elements in the study of chemical reactions.

New Control Orders

Coal-Tar Acids Delivered to U.S.

THE Coal-Tar Products Prices (No. 2) Order, 1945 (S. R. & O. 1945, No. 1010), amends Articles 53, 55, and 58 in Part V of the Coal-Tar Products Prices Order, 1943 (*see* THE CHEMICAL AGE, 1943, *49*, p. 476), applying to the sale or supply of such acids for delivery in the U.S.A. By reason of the new Order, Part V will not apply to such sales or supplies as from September 4, 1945.

Sulphuric Acid

The Ministry of Supply has issued a Direction No. 4 (S. R. & O. 1945, No. 1170) under the Control of Sulphuric Acid (No. 2) Order, 1940, providing new maximum prices for all sulphuric acid of strengths between 136° Tw. at 60° F. and 25 per cent. free SO_3 content. The Direction comes into force on October 1.

Relaxations in Export Control

Under the Export of Goods (Control) No. 7 Order, 1945 (S. R. & O. 1945, No. 1146), which came into operation on September 24, export licences will no longer be required for a very large number of items. The principal changes are:—

(a) Machinery has been removed entirely, apart from a few unimportant exceptions.

(b) Ball bearings have been removed.

(c) The list of metal manufactures has been greatly reduced and now only covers a few types of goods in short supply.

(d) Semi-manufactures of some non-ferrous metals, including copper and zinc, have been deleted.

(e) Instruments and apparatus, etc., are now free except surgical instruments and appliances, certain cameras, lamps, and lenses, instrument jewels, and cellulose and cotton absorbent and wadding.

(f) Electrical goods have been reduced to two items, *viz.*: lead acid accumulators and cooking and heating appliances.

(g) Among chemicals and drugs, more than 150 of the 400 items have been removed from the list.

It has proved necessary to add a few items to the list either because of shortage of supplies or the need to control distribution. The principal substances are penicillin, uranium compounds and other radioactive materials, ethyl silicate, dimethylamine, paraphenetidine, borax and boric acid, and caproic acid.

Exporters are strongly advised to consult the Order itself to ascertain the position as regards goods with which they are concerned.

Pyrethrum

The Control of Pyrethrum (No. 3) (Revocation) Order (S. R. & O. 1945, No. 1163), which came into force on September 26, revokes the corresponding Nos. 1 and 2 Orders. The revoked orders prohibited the acquisition, disposal, treatment, use, and consumption of pyrethrum and pyrethrum products except under licence. The Ministry of Supply holds stocks of pyrethrum flowers which were acquired for war purposes and are now available to meet civilian requirements. Supplies of flowers (in quantities of 4 cwt. or multiples of 4 cwt.) may be obtained from the Director of Sundry Materials, M.O.S., 8-10 Old Jewry, London, E.C.2.

General News—From Week to Week

The following items should now be deleted from the list of M.E.S.C. import modifications: D.D.T., sodium bichromate, potassium bichromate.

An arrangement has been made with the Metropolitan Vickers Co., Ltd., Manchester, under which the section manufacturing laminated plastics under the trade name of "Traffolyte" is being taken over by De La Rue Insulation, Ltd., on October 1.

After being closed for four years as the result of enemy action, the Chemical Engineering Department at University College, London, is reopening on October 1. It has not yet been possible to effect any repairs to the Ramsay Laboratory, but temporary accommodation has been provided by the Engineering Department to enable a start to be made. A limited number of students is being admitted for both undergraduate and diploma courses.

The Gas Light & Coke Company announces that the address of its salesman's office (formerly at Frederick's Place, Old Jewry) will, from September 27, be: 6-7 Queen Street, Cheapside, London, E.C.4. (Tel. CITy 4945-7.)

The Hull Section of the Oil and Colour Chemists' Association, in conjunction with the University College of Hull Extension Committee, has arranged a University Extension Course of eight weekly lectures entitled "The Chemical Molecule," to be given by Professor F. G. Tryhorn and Dr. W. B. Orr (of the Chemistry Department, University College of Hull), commencing Wednesday, October 24, at 7 p.m., in the Chemistry Lecture Theatre of the University College of Hull. The fee for the series is 7s. 6d., payable on enrolment at the opening lecture. A reduced fee of 2s. 6d. will be made for students of schools and colleges.

The Gas Light and Coke Company is to reduce the price of gas to consumers; details of the new prices will be issued within the next week or two. A reduction has been made possible as a result of increasing business, but the new prices will not compare with those prevailing before the war owing to the considerable increase in costs.

The Royal Technical College, Glasgow, is to appoint a lecturer in colour chemistry at a starting salary of £650. The college has announced a full curriculum of technical training in day and evening classes starting September 26, and embracing inorganic, organic, and physical chemistry, fuels, oils, dyeing and bleaching, chemical plant technology, gas engineering and supply, and metallurgy.

The house magazine of George Cohen, Sons & Co., and associated companies, under the familiar appellation "600," continues its mixture of the serious and the gay. The latest issue gives a survey of the war work of their associated companies at Letchworth, and announces the acquisition, by Metalclad, Ltd., of the entire contents of the works of Smith Peace (Keighley), Ltd., sawmill engineers.

Foreign News

A coal research institute has been established in Katowice, Poland.

A chemical products department is to be set up by the Standard Oil Company.

Switzerland's chemical factories numbered 331 at the end of 1944.

The Monsanto Chemical Co. is establishing a new factory at Seattle, Wash., for the manufacture of plywood adhesives.

Acetic acid production in the United States amounted to 332,444,000 pounds, out of which 291,954,000 pounds were made synthetically.

The Brazilian Metals Association (Associaçao Brasileira de Metais), a new scientific organisation, has recently held the first Brazilian Congress of Metals in Sao Paulo.

A research fellowship for the study of organic syntheses based on benzyl chloride and other benzyl compounds has been established at Rutgers University, New Brunswick, N.J., by the Benzol Products Co., Newark, N.J.

Official statistics indicate that the volume of production of the principal Chilean mining industries for the first half of 1945 was: nitrate of soda, 594,294 metric tons; copper, 238,297 tons; and coal, 1,066,091 tons.

The old-established porcelain industry in Meissen is in production again. Under a new director, it is concentrating on the output of household crockery; at the same time it is seeking to establish a high artistic standard in this new field.

The arsenic industry of Southern Rhodesia has been modernised and two refineries in the Salisbury area are producing now a product of 99-99.5 per cent. purity in a single working process.

To inform U.S. industrialists about technical advances made during the Hitler régime, the W.P.B. has set up the Enemy Technical Report Committee, under the chairmanship of Dr. D. B. Keyes.

According to a new Swedish decree, all aluminium and alloys, wrought or unwrought, raw materials, scrap, ashes, etc., containing more than 50 per cent. of its weight in aluminium, may not be imported without special permission from the Industry Commission.

A Soviet scientist, Leonid Vereschagin, has, according to *Tass*, designed an installation for studying chemical reactions at a pressure of 50,000 atm. This is reported to be a high-speed hydraulic compressor of continuous action, which can be operated by one man without special training.

During the first six months of 1945 sulphur was consumed at a record rate in the United States and production (1,748,442 long tons) was 23 per cent. higher than in the same period in 1944. Sales were 20 per cent. higher at 2,072,024 tons, and in June, producers shipped more sulphur than in any previous month.

The Foreign Economic Administration announces that U.S. Government purchases of mica from all foreign areas will terminate on or before December 31. Official procurements will cease on November 30 in Brazil and India, where there has been joint purchasing by the U.S. and U.K. Governments. U.S. purchases in British Africa will cease on December 31.

The construction of a central research laboratory on the United States-Canadian border at International Falls, Minnesota, and the expansion of the present staff to include additional chemists, physicists and engineers, is announced by the president of the Minnesota and Ontario Paper Company at Minneapolis. Completion of the building is expected early next spring. It forms part of a recently announced $6,000,000 expansion and modernisation programme.

A survey of the lead deposits of S.W. Africa has revealed that the available reserves of metallic lead are about 230,000 tons, sufficient to meet demands of the Union of South Africa (at the present rate) for nearly 50 years. From the Tsumeb mine (in the N.E. part of the territory) alone, some 200,000 tons could be recovered. This mine, already a paying proposition, produced over 5000 tons of lead in 1928-9, but has been worked chiefly for copper, with lead, silver, cadmium and vanadium as by-products.

The latest issues of German chemical journals, *Die Chemische Technik*, Berlin, and *Chemiker Zeitung*, Cöthen, are being "reproduced and distributed in the public interest" by the Alien Property Custodian in lithoprints by Edwards Brothers, Inc., Ann Arbor, Mich., U.S.A.

Plans are being drawn up by the Ecuadorian Ministry of Economy for the establishment of a fertiliser factory near La Libertad, Ecuador. A recently discovered guano deposit on the island of El Pelado, about 15 miles from La Libertad, will supply the requirements of the factory. In addition to guano, phosphates are present in this deposit. A substantial deposit of limestone is stated to be also in the vicinity.

Forthcoming Events

October 1. Society of Chemical Industry (Plastics Group and Yorkshire Section). Chemical Lecture Theatre, Leeds University (entrance Woodhouse Lane), 6.30 p.m. Dr. W. T. Astbury, F.R.S.: "Macro-Molecules."

October 1. Society of Chemical Industry (London Section). Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1. 7.15 p.m. Dr. E. S. Hedges: "New Development in Tin and Tin Alloy Coatings."

October 3. Pharmaceutical Society. 17 Bloomsbury Square, London, W.C.1, 3 p.m. Opening of 104th session; inaugural address by the President, Mr. J. C. Young.

October 3. Society of Public Analysts. Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1, 6.30 p.m. Mr. Eric C. Wood: "The Theory of Certain Analytical Procedures, with special reference to Microbiological Assays."

October 3. Institute of Fuel (London Section). Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. Mr. M. W. Thring and Mr. J. W. Reber: "The Effect of Output on the Thermal Efficiency of Heating Appliances."

October 4. Chemical Society, Burlington House, Piccadilly, London, W.1. 5 p.m. Dr. U. R. Evans: "Recent Work on Corrosion and Oxidation Reactions."

October 4. Royal Institute of Chemistry, Society of Chemical Industry, Chemical Society, and British Association of Chemists, Chemistry Lecture Theatre, Liverpool University. 7.30 p.m. Mr. P. N. Williams: "The Chemist as a Soldier—a Story of the Special Brigade, R.E."

October 4. Institute of Physics (Midland Branch). Connaught Room, Imperial Hotel, Birmingham. 10.30 a.m. and 2 p.m. Joint meeting with the X-ray Analysis Group on "Physical Methods for the Identification of Materials."

October 4. The Chemical Society, Royal Institute of Chemistry and **Society of Chemical Industry** (Bristol and South-Western Counties Sections), University Chemical Dept. (Woodland Road), Bristol. 5.30 p.m. Dr. H. Martin: "Chemical Studies on Insecticides."

October 5. Society of Chemical Industry (Plastics Group and Glasgow Section). Royal Technical College, Glasgow, 7.15 p.m. Professor H. W. Melville, F.R.S.: "The Structure and Synthesis of Vinyl Plastics."

October 5. Oil and Colour Chemists' Association (Manchester Section) and **British Rheologists' Club.** The Engineers' Club Albert Square, Manchester. 2 p.m. Joint discussion: "Some Rheological Properties of Suspensions."

October 10. Institute of Fuel (North-Western Section). Municipal Annexe, Dale Street, Liverpool, 2.30 p.m. Mr. W. A. Pain: "Power from Process Steam."

October 10. Society of Chemical Industry (Newcastle section) and **Royal Institute of Chemistry.** Chemistry Lecture Theatre, Newcastle University. 7 p.m. Dr. H. Baines: "The Choice of Photographic Materials for Scientific Purposes."

October 11. Royal Institute of Chemistry (Cardiff Section). Visit to I.C.I. Dowlais works. 2.30 p.m.

October 11. Royal Institute of Chemistry (London and South-Eastern Counties Section). Public library, William Street, Slough, 7 p.m. Dr. J. M. Walter: "Recent Advances in Plastics."

October 11. Society of Chemical Industry. (R. & B. M. Group and London Section). Gas Industry House, 1 Grosvenor Place, London, S.W.1. 6 p.m. Professor E. K. Rideal, F.R.S.: "Some Physico-Chemical Problems in Construction."

October 12. The British Association of Chemists (St. Helens Section). Y.M.C.A. Buildings, 7.30 p.m. Mr. H. Pritchard: "Chromatography."

October 12. Society of Chemical Industry (South Wales Section). Royal Institution, Swansea. 6.30 p.m. Mr. F. Gill: "New Physical Methods in Examining Petroleum Products."

Company News

Thorncliffe Coal Distillation, Ltd., reports a profit, for the year to June 30, of £51,744 (loss of £36,190).

Murex, Ltd., announces a profit, for the year ended June 30, of £213,032 (£239,446). A final ordinary dividend of 10 per cent. and a cash bonus of 2½ per cent. make a total of 20 per cent. (same).

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *— followed by the date of the Summary, but such total may have been reduced.)

CHEMICAL DEVELOPMENT CO., LTD., London, S.W. (M., 29/9/45.) August 31, mortgage to Martins Bank, Ltd., securing all moneys due or to become due to the Bank: charged on 156-168 (even) Kensal Road, Paddington, with plant, fixtures, etc.

CARBOMETALS, LTD., Maidenhead. (M., 29/9/45.) September 3, debenture to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *——. December 31, 1944.

Satisfactions

PARKIN NESS & CO., LTD., Darlington, chemical manufacturers. (M.S., 29/9/45.) Satisfaction, September 7, £850, registered November 30, 1940.

MENLEY & JAMES, LTD., London, S.E., manufacturing chemists. (M.S., 29/9/45.) Satisfaction, September 6, £15,000, registered December 9, 1919.

Company Winding-Up Voluntarily

ALUMINIUM DEVELOPMENT ASSOCIATION, LTD. (C.W.U.V., 29/9/45.) August 24 (members). F. L. Heathcote, Netherwood, Chessetts, Wood Road, Lapworth, liquidator.

Chemical and Allied Stocks and Shares

GENERAL conditions in stock markets showed little change during the past week, a firm undertone contrasting with inactive business awaiting the outcome of important international discussions. British Funds were well maintained, but Foreign Bonds receded. Bank of England stock improved and there was a better tendency among "nationalisation" groups generally, particularly home rails. Leading industrials continued firmly held, with the result that prices responded readily to any moderate improvement in demand. Attention again appeared to centre on shares of companies with overseas and export interests.

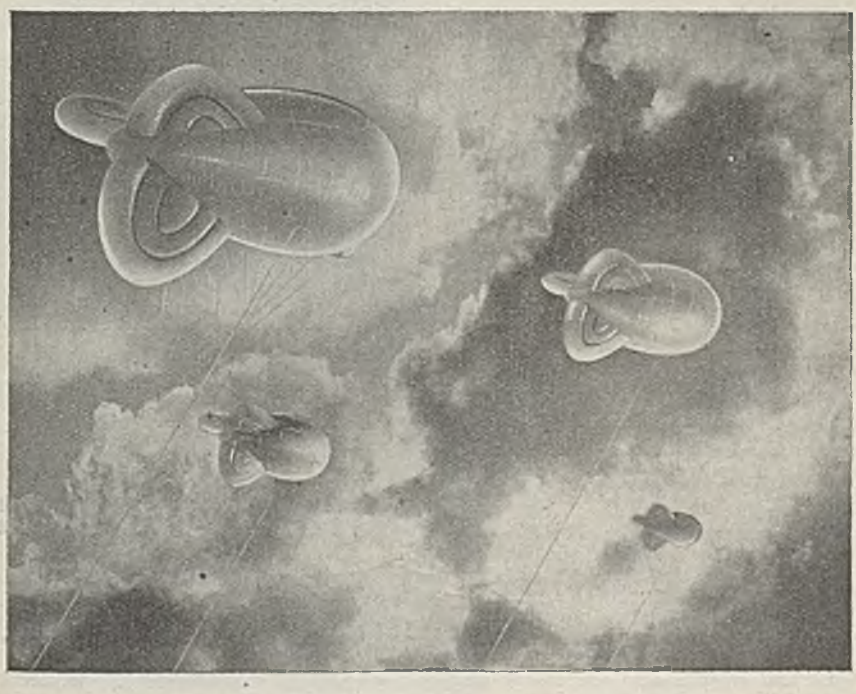
Turner & Newall were prominent with a further rise to 82s., attention being drawn to the company's important home and overseas business and also to the prevailing assumption that in due course dividends should regain pre-war levels. Imperial Chemical further strengthened to 39s., the yield of over 4 per cent. being regarded as attractive. Lever & Unilever fluctuated around 50s. 9d. pending the dividend announcement. Distillers were again favoured and moderately higher at 117s., with De La Rue steady at £10¾, while General Refractories 10s. shares, after an earlier reaction, firmed up to 16s. 6d. Amalgamated Metal receded to 18s. Wall Paper Manufacturers deferred kept firm at 42s., reflecting market talk of improvement in dividend for the current year. Firmness was shown in British Oxygen at 85s. Borax Consolidated deferred were 44s. 9d. and Dunlop Rubber further strengthened to 52s. 7½d. Among engineering and kindred shares, Aveling-Barford firmed up to 20s. 4½d. on the results, and Brightside Foundry were higher at 37s. 3d. xd on the decision to distribute a bonus in due course. On the other hand, Fisher & Ludlow at 42s. 6d. lost part of an earlier rise. British Plaster Board were 36s. 6d., but Triplex Glass 10s. ordinary receded to 40s.

United Glass Bottle ordinary were firm at 71s.; Forster's Glass 10s. shares were higher at 40s., while Jackson Bros. (of Knottingley) 5s. shares continued their rise, changing hands up to 22s. 6d. B. Laporte held at 87s., Monsanto Chemicals 5½ per cent. preference at 23s., and Greeff-Chemicals Holdings 5s. ordinary at 9s. Cellon 5s. ordinary were around 26s. 6d. and British Aluminium steady at 42s. Nairn & Greenwich rose further to 80s. and Barry & Staines were 53s. 6d. Among textiles, Courtaulds were more active and slightly higher at 55s. Metal Box shares kept firm at 90s., Sangers were 31s., Beechams deferred 19s. 10½d., Timothy Whites 42s. 1½d., and Boots Drug strengthened to 54s. 6d. In other directions, Associated Cement were 54s. 3d., Tunnel Cement 44s., and Crittalls 28s. 6d.

Iron and steels attracted steady demand and were firm generally, with Dorman Long 26s. 6d., Guest Keen 40s. 6d., Stewarts & Lloyds deferred 54s. 9d., Babcock & Wilcox 57s. 3d., and Ruston & Hornsby 58s., while Clarke Chapman moved up to 48s. 9d., and Allied Ironfounders at 52s. 3d. were also better. Davy Engineering were 34s. 9d., Staveley 46s. 9d., and Powell Duffryn 22s. International Paint kept at 120s., and Pinchin Johnson 10s. ordinary at 38s. 6d. United Molasses were little changed at 41s. 6d. British Industrial Plastics 2s. shares were 6s. 7½d., and Erinoid 5s. ordinary were more active up to 11s. 9d. awaiting the results.

Oils were unaffected by the new Anglo-U.S. agreement; Anglo-Iranian being 113s. 9d., Shell 81s. 3d., and C. C.

For your War ALBUM



SILENT BARRAGE

No. 3 The Barrage Balloons, whose deadly steel cables scared off the enemy's dive bombers.
Operated mainly by Britain's W.A.A.F.
One of the sights of World War No. 2 pictured for you by . . ..

Wakefield 56s. 6d., but Kern Oil improved to 4s. 7½d. and Mexican Eagles to 12s. 7½d.

British Chemical Prices

Market Reports

A FIRM tone characterises most sections of the London general chemicals market and there is no easing in the pressure for deliveries against contracts. Fresh business has been of fair dimensions and there has been some export booking. A firm price position has been reported from most sections of the market. In the soda products section, chlorate of soda is an active item and a good inquiry is reported for bicarbonate of soda and soda ash. A good trade is passing in hyposulphite of soda and nitrate of soda, while no improvement is reported in the supply position of yellow prussiate of soda. Glauber salt and salt cake are steady. The demand for the majority of the potash chemicals continues on steady lines, with scarcity of supplies and firm price conditions the chief features. In other directions a steady inquiry is recorded for calcium, glycerine (pure and refined), hydrogen peroxide, and formaldehyde, while a moderate trade is passing in barium chloride and alum lump. White powdered arsenic is a strong market and offers of borax are quickly absorbed. In the acid section a steady demand is reported for oxalic, citric, and tartaric, and moderate quantities of salicylic acid are being taken up. A fairly steady trade is passing in the coal-tar products section, with both home and export orders for pitch. Carbolic and cresylic acid are steady and creosote oil is a good market. A moderate inquiry is reported for the xylols and naphthas.

MANCHESTER.—New business in heavy chemical products on the Manchester market during the past week has included moderate bookings from home industrial users and some additional orders for export, the latter covering the alkalis and other leading classes. Further shipping inquiries are now being dealt with. Taking the trade as a whole, home contract supplies are being called for fairly steadily. In fertilisers, the most active sections at the moment are basic slag, lime, and sulphate of ammonia, more particularly the two first. Fresh orders in the tar products market locally have not been plentiful so far as the light distillates are concerned, and the possibility of early price cuts is being discussed.

GLASGOW.—In the Scottish heavy chemical trade business has been more active during the past week for home trade. Prices remain firm at previous levels. Export inquiries are well maintained.

SERVICING

GRINDING, Drying, Screening and Grading of materials undertaken for the trade. Also Suppliers of Ground Silica and Fillers, etc. JAMES KENT LTD., Millers, Fenton, Staffordshire. Telegrams: Kenmil, Stoke-on-Trent. Telephone: 4253 and 4254, Stoke-on-Trent (2 lines).

GRINDING of every description of chemical and other materials for the trade with improved mills.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3285 East

SITUATIONS VACANT

None of the situations advertised in these columns relates to a man between the ages of 18 and 50 inclusive or a woman between the ages of 18 and 40 inclusive, unless he or she is excepted from the provisions of the Control of Engagement Order, 1945, or the vacancy is for employment excepted from the provisions of that Order.

ASSISTANT required (preferably under 30) in Sales office of important Plastic Manufacturers. Knowledge of the chemistry of Plastics would be an advantage. State full particulars of previous experience and salary required. Box 2237, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

QUALIFIED chemist required for old-established Firm of Cable Manufacturers in the London Area to take charge of the Paper Cable Laboratory. In addition to supervising the routine work of the Laboratory, applicants must be capable of undertaking investigational and development work and of dealing with various chemical problems arising in power cable construction, installation and operation. Sound experience in the technique of cable practice is essential and preference will be given to applicants familiar with high voltage applications. Age about 30–35. Commencing salary £400–£500 according to qualifications and experience. Participation in the Company's superannuation scheme is a condition of employment becoming effective after one year's service. Applications will be treated as strictly confidential and should give full details of education, training, and qualifications and complete record of all previous experience. Box No. 2236, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WANTED

POWDER filling machine wanted. Send full details and prices to Box No. 2238, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WANTED.—Supplies of Nitre Cake in ten-ton lots. Box No. 2126, THE CHEMICAL AGE, 154, Fleet Street, E.C.4.

WORKING NOTICE

THE Proprietors of British Patent No. 554,986, entitled "Improvements in or relating to methods of increasing adhesion of bitumen to stone, and the preparation of paving materials," desire to secure the commercial development of the invention in Great Britain, and to negotiate for the grant of licences to manufacture under royalties. Enquiries in the first instance should be addressed to D. T. Cross, 36, Queen Anne's Gate, Westminster, S.W.1.

Printed in Great Britain by THE PRESS AT COOMBELANDS, London and Addlestone, and published by BENN BROTHERS, LTD., at Bouverie House, 154, Fleet Street, E.C.4, September 29th, 1945. Entered as Second Class Matter at the New York, U.S.A., Post Office.