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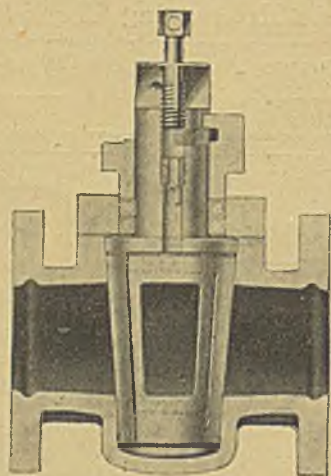
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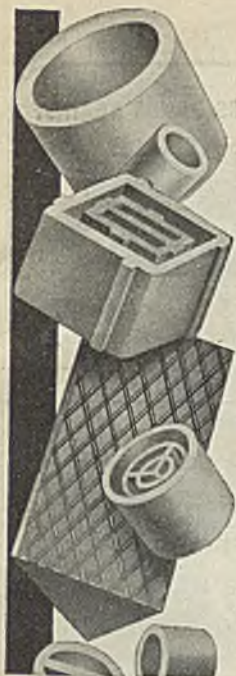
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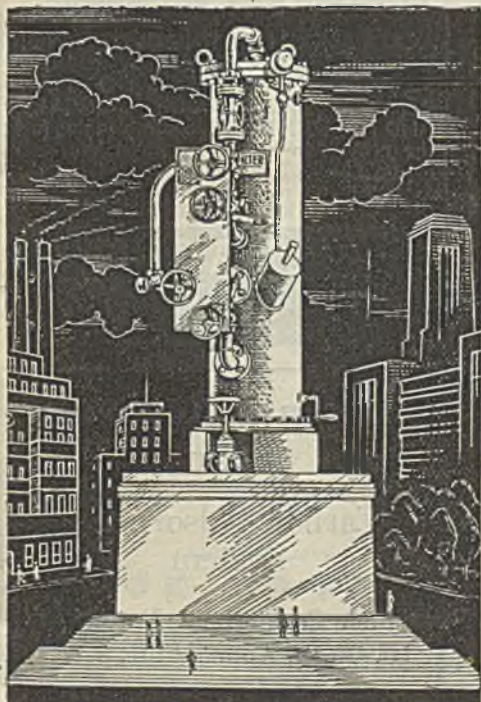
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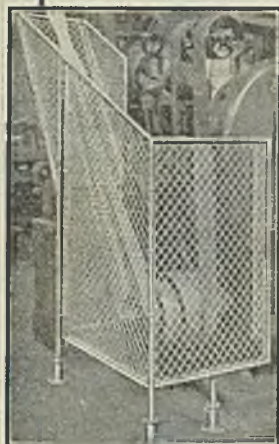
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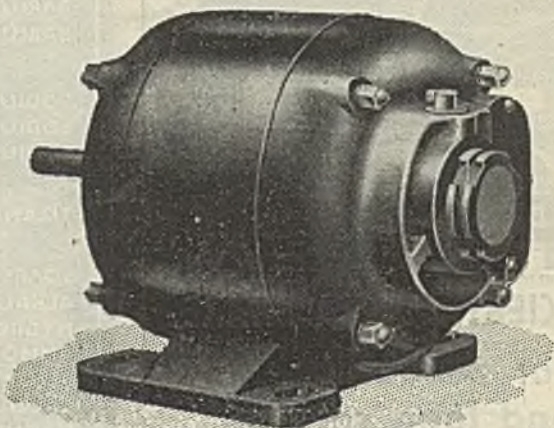
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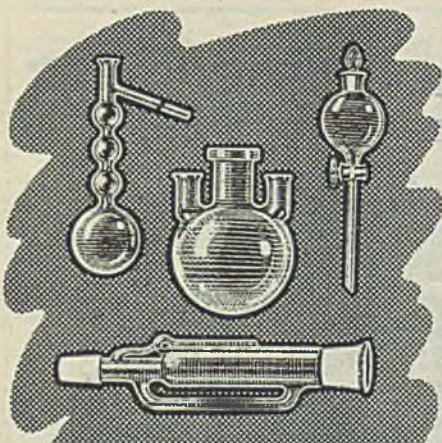
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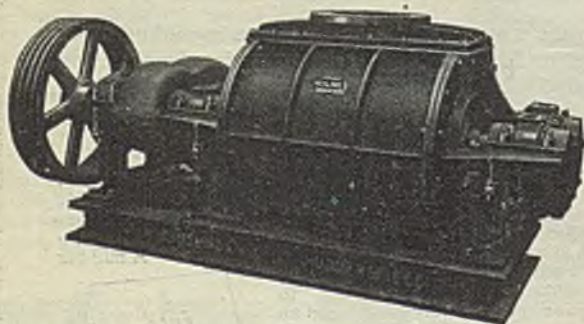
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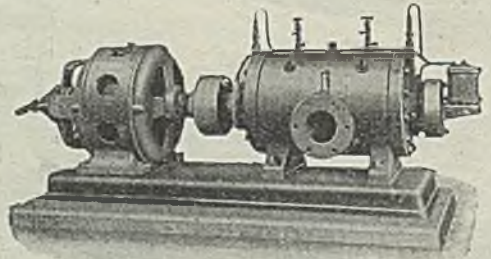
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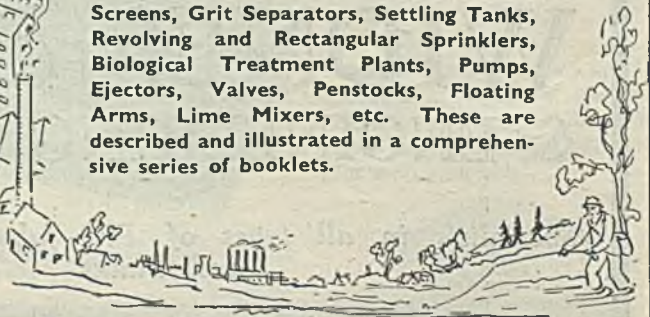
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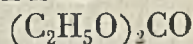
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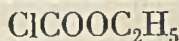
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Response to Environment

THE time is coming when those who have been in the Forces for "the duration" will be returned to industry. Many of them have never been in industry before; they went straight into the Services from school; they may have risen during the stress of war to positions in which they command men; but conditions as they know them will be very far removed from those they will meet in industry. It is not necessary to labour this point, since those who have had any experience of both Service life and industry know the differences.

Just two points of fundamental difference should be especially noted, however. One is that in the Services the men under command give, expect to give, and are expected to give unquestioning obedience to any order, however distasteful it may be.

"Their not to reason why." That will not be the position in industry. There the men (and women) work under conditions of free-will and of team work. The difference is that in industry those in contact in the same works form a team, a team that must have sufficient of the team spirit to obey the captain, but who will not obey a captain who has not their confidence. The approach to

handling men must be different. The other important difference is that in the Services results count irrespective of monetary cost (and sometimes irrespective of human cost); in industry costs dominate events. Thus those who will come back into industry from the Forces may have much to unlearn. The transition will probably not be very difficult for those who had been in industry beforehand, but the new entrants will have a difficult and possibly a painful adjustment to make. Whether they will fit in easily or not depends on the rapidity of their response to their environment. It is foolish to promise discharged officers "fat" posts in industry immediately; like everyone else they will have to prove their value first.

No doubt most of those who aspire to attaining good posts in industry will be trained before being thrown into the whirlpool and told to swim. That happened after the last war, when many men spent their savings or the honorarium given them on discharge in taking courses at the Universities which led to "war" degrees. That opens up the importance of planning such courses carefully.

On Other Pages

| | |
|---|-----|
| <i>Notes and Comments</i> | 155 |
| <i>Penicillin Film</i> | 156 |
| <i>Progress in Drugs, Fine Chemicals, and Biological Products in 1944-IV</i> | 157 |
| <i>Parliamentary Topics</i> | 160 |
| <i>Chemical Engineering School</i> | 160 |
| <i>Lac Prices</i> | 160 |
| <i>Hazards of Contact With Chemicals</i> | 161 |
| <i>Handling Nitric Acid</i> | 162 |
| <i>Chemical Progress in S. Africa</i> | 163 |
| <i>Port Sunlight at War</i> | 164 |
| <i>Letter to the Editor: Scientific Publicity</i> | 165 |
| <i>Personal Notes</i> | 166 |
| <i>General News from Week to Week</i> | 167 |
| <i>Forthcoming Events</i> | 168 |
| <i>Commercial Intelligence</i> | 169 |
| <i>Stocks and Shares</i> | 169 |
| <i>Chemical Prices</i> | 170 |

The academic impulse is to cause every chemist to go through the routine mill in pure chemistry, on the ground that if one has the fundamentals of the subject, the details of specialist industries, etc., can easily be filled in. That is right up to a point. But the long-continued argument about the training of chemists or chemical engineers for industry seems to suggest that all is not well. A very young man can no doubt be put right through the "pure science" mill from start to finish, and if there is much that he learns that he will never apply throughout the whole of the rest of his life, it does not greatly matter. It is all to the good that he should have a wide knowledge of his subject and at least know that these things exist—or are thought to exist. But in his later studies there are other things that should be taught him.

The older man returning from the war should clearly be given a different curriculum. Much of the academic stuff can be omitted and left for his own private study; he will want to know only as much as will fit him to earn his living in industry quickly. This, of course, is rank heresy. In a textbook on chemistry published in the days of our extreme youth we recollect the glee with which the author recounted how a visitor to the Royal School of Mines brought his son with the request that he should "do copper"; he did not want him, he said, to waste his time learning about atoms and molecules and all that sort of thing—he just wanted him to "do copper." Put in that way it all sounds very absurd. The Halls of Olympus justifiably ring with Jovian laughter. Put in a more commonsense way, however, there is a certain amount of sound sense somewhere at the back of it. There is an awful lot of dead wood in the teaching of most sciences. There is a mass of material that it is foolish to memorise; all that is required is that it shall be known to exist and where it can be found. What the student requires is a sound knowledge of principles. In our private view a knowledge of the principles of physics is as important in industry—even in chemical industry—as a knowledge of the principles of chemistry. That suggests to us that for older men it should be possible to devise a course that will give them the ground-

ing they need to enable them to become useful members of an industrial team, leaving them to acquire much more by their own later reading, and through a ready response to their new environment.

Certain things that are fundamental should be taught, however. One of these is that speed counts in industry; the reason is that costs dominate industry. Rapid methods of analysis may not give the first place of decimals correctly, but they may save hundreds of pounds in avoiding waste by allowing quick decisions to be taken. Capital cost, costing of steam, of production, of repairs and maintenance, must all be impressed upon the new entrant. The fact that the rule-of-thumb methods of the workman may have something in their favour must not be neglected. The young chemist (the young in experience, we mean) must be taught not to be too dogmatic; "prove all things, hold fast that which is good," is a good motto, and over-hasty condemnation of "practical" methods may result in more friction than advancement. Then, again, many industries have been built up on special methods and knowledge which cannot be taught at a college. The new entrant must be warned that he will have to discover these things for himself, and that until he has done so he will not be especially useful in his new job, and must walk humbly. Employers can themselves do much to assist in gaining this knowledge by helpful suggestions and by taking an interest in the work of their staff. All these things will help the man from the Services or the new entrant from the University to respond rapidly to his environment. Until a man has responded to his environment and rubbed off his angles, he remains a square peg in a round hole.

The following reprints from the Smithsonian Report for 1943, published by the Smithsonian Institution, Washington, have just arrived in this country: "Petroleum Geology," by William B. Heroy, Director of Foreign Production Petroleum Administration for War; "The Sea as Storehouse," by Dr. E. F. Armstrong, F.R.S.; "Progress in New Synthetic Textile Fibres," by H. R. Hanerberger; and "Chemo-therapeutic Agents from Microbes," by Robert L. Weintraub, Division of Radiation and Organisms, Smithsonian Institute.

NOTES AND COMMENTS

Carbonising and the Future

DR. G. E. FOXWELL and his writings are well known to readers of THE CHEMICAL AGE, but it is doubtful whether his unobtrusive but untiring work for the good of the chemical and allied industries has met with the acknowledgment it deserves in all the branches of industry which have been beneficially affected by it. He has made a special study of the carbonising industries, both in respect of their normal and of their war-time activities, and no one, in consequence, is better qualified to pass judgment on their prospects and duties for the future. His considered opinion is expressed in a paper on "The Carbonising Industries after the War," which was presented on February 1 to the Midland Section of the Coke-Oven Managers' Association, and has been published in full in *The Gas World* (Coking Section, February 3, p. 23). As always, Dr. Foxwell's pronouncements are rich in suggestive ideas, though he himself, with genial cynicism, quotes Bishop Creighton to the effect that "An Englishman not only has no ideas; he hates an idea when he sees one." Much of the paper ably summarises the conclusions that have appeared from time to time in the *Journal of the Institute of Fuel*, *The Gas World*, and other technical journals, as well as in our own columns, but, appropriately, the sting of the address is in its tail, where the suggestion is put forward that a Central Carbonisation Board might be formed, working on the lines of the Central Electricity Board.

Coke and the Chemical Industry

IF, as Dr. Foxwell states, there is going to be a vastly increased demand for smokeless fuel, there can be no doubt that some sort of co-ordination will be required in the coke-oven industry, which, as the author points out, has never had commercial stability. The suggested Carbonisation Board is just one example of the sort of thing that might be done. Where the chemical industry comes in, of course, is in the utilisation of the products of the carbonising industries, such as we have been urging for some time past. Investiga-

tion (to say the least) should be made into the Fischer-Tropsch process; into the usage of methane and ethylene; and into the manufacture of carbide from coke. The important thing is that any chemical processes developed should be continuously operated at high output; the capital outlay will be heavy and nothing in the nature of an intermittent process using spare gas is worth considering. Given the requisite economic conditions, it seems likely that a gas grid would be of value to the chemical industry in supplying gas, in a reliable manner, to the factories working the newly-developed processes. Any such factories moreover, would then depend, as to size, not on the size of the coke-oven plant to which they happened to be attached, but to the scope for their products in the market. That seems to be sound economics, and such a scheme would simply be an additional business venture to which both of the industries concerned should make contribution.

No Room for News

IN both this week's and last week's issue we have printed letters from correspondents, arising out of an editorial which appeared on January 27, adverting to various aspects of the subject of scientific publicity. In all these, the method, or rather the lack of method, by which publicity is given to scientific and technical advances in this country was deplored, and we are glad indeed to be able to ventilate this eminently just grievance. There is another aspect of the case, however, to which our correspondents have not drawn attention; and this aspect is becoming more and more prominent every day. However near or far may be the actual end of the war, there is no doubt that its impact on this country is diminishing; and the need for "security" diminishes accordingly. News, technical news of the highest importance, is becoming increasingly available for publication. To take an example, the Central Electricity Board has published at one fell swoop its reports for the years 1940-43, and it requires no great stretch of imagination to surmise that the electrical Press will wish to comment on these reports to

some considerable extent. We hope they will be able to find space, with their restricted paper allowance, to make adequate comment; but we think they will be faced with a knotty problem. There is no doubt about it: technical journals will have to have an increased allowance of paper if justice is to be done to the brilliant achievements of our scientists and technologists which will soon be urgently demanding publication.

A Little Sting

IT was almost more than we could have hoped for when we expressed in this column a few weeks ago our criticism of the paper allocation policy of the Ministry of Supply, that we should find so doughty a champion as Lord Samuel on our side. Addressing the annual luncheon of the Parliamentary and Scientific Committee, its president deposited what he described as "a little sting" in the body of His Majesty's Government. Doling out small parcels of paper here and there, instead of restoring as speedily as possible supplies of paper in order to give the nation free access to literature of all kinds is doing immense harm to our national cause. To spread news of British achievements over the world is completely and utterly impossible, so long as this miserly policy is allowed to persist. At a time when men and women in many lands are anxious to obtain literature from and about Britain, all that can be done is to proffer a meek apology for the strict paper regulations. "The harm done," said Lord Samuel, "is quite out of proportion to the advantage gained in the saving of shipping and labour." Though late in the day, it is, we hope, not too late to overturn this "Penny Wise, Pound Foolish" system. The Committee at whose meeting this valuable criticism was made should use its weighty influence to ensure an immediate relaxation of the fetters of the Paper Control.

A War-Time Record

ON another page we illustrate the war-time achievement of Lever Brothers' Works at Port Sunlight in changing over from the exclusive manufacture of soap, and the like, to a highly important output of direct munitions of war. This is just one example of the

way in which all ranks in industry readily, in fact eagerly, turned their hands to whatever was most needful. Every industrial establishment, however small, has its war-time story and these stories will be due for publication in increasing numbers as the stringency of "security" inevitably lessens. On September 3, 1939, there were just over 7000 employees at Port Sunlight. Of that original number over 2000 have been "called up," and of those who entered the company's employment since the war, many more have been directed to various branches of the national service. A heavy load of munition production has been borne, with outstanding success, by those who remained—including over 1000 part-time women, many of them grandmothers. The chemical and allied industries have had to rely on women as never before, and we have already celebrated their achievements (THE CHEMICAL AGE, November 25, 1944, p. 503). The women workers in our pictures this week appear perfectly confident and happy in their work; and we are glad to note that one of them is provided with safety instructions clearly printed on a wall-notice. We hope that more such records will become available to the public as time goes on.

PENICILLIN FILM

The British discovery, development, and production of penicillin and its use in the treatment of war wounds has been filmed. The picture, which is being sponsored jointly by Imperial Chemical Industries and the Therapeutic Research Corporation, will, it is hoped, be completed within the next few weeks and will then be widely shown at home and abroad under the auspices of the M.O.I. and the British Council. The film deals at length with the discovery of penicillin by Sir Alexander Fleming, its subsequent development by the Oxford Group of workers under Sir Howard Florey, the various stages in British industrial production of the material, and its use on the battlefields of Holland and Belgium and in the hospitals in Britain. The film has been made with the personal co-operation of both Sir Alexander Fleming and Sir Howard Florey both of whom appear personally in it. The Army Penicillin Unit and S.H.A.E.F. have afforded the producers the utmost help in obtaining the casualty sequences on the battle-fronts and at home. The film is being made by Realist Films and directed by Alexander Shaw.

Progress in Drugs, Fine Chemicals and Biological Products in 1944—IV

by G. COLMAN GREEN, B.Sc., F.R.I.C., A.M.I.Chem.E.

(Continued from THE CHEMICAL AGE, February 3, 1945, p. 124)

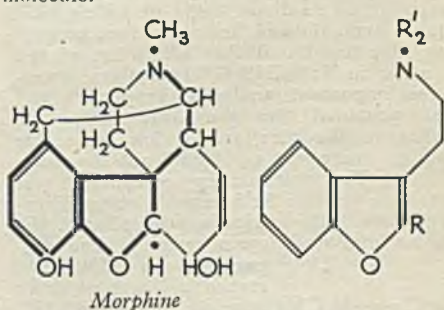
THE economical disposal of mycelium from industrial mould-fermentation processes is always a difficult problem, and the use of the mycelium has been explored during the past decade or more as a source of ergosterol. It is now proposed to use the mycelium produced in penicillin production. The non-saponifiable matter from a butanol extract of the wet mycelium yields a sterol corresponding with ergosterol which may be irradiated to vitamin D₂ (*Science*, 1944).

Dodds (*Endeavour*, 1944) has outlined the routes by which the synthetic oestrogens were evolved. In an attempt with Cook and Hewitt to find the pharmacologically active groupings proceeding through structures with two fused rings (instead of the four in naturally occurring oestrogens) 4:4'-dihydroxystilbene was arrived at, which, with related substances, qualitatively, but not quantitatively, resembled the oestrogens. Further simplification was attempted by eliminating one of the rings to give anol. This was prepared from its methyl ether, anethole (*i.e.*, the methyl ether of *p*-propenyl phenol), the chief constituent of oils of anise and fennel. Variable oestrogenic potency of different batches led to the isolation of the symmetrical dimeride of high potency.

In collaboration with Robinson, 4:4'-dihydroxydiethylstilbene was prepared and found to be about 2½ times more powerful than oestrone, and this substance has been available commercially for some time as stilbæstrol. Further examination, with Campbell, of the mother liquors from anol production, yielded "hexæstrol" which differs from stilbæstrol in that the double bond between α and β carbon atoms is hydrogenated. By a different route, an isomer was obtained with double bonds between the C₂H₅ groups and the α and β carbon atoms, giving γ : δ -bis (4-hydroxyphenyl)- $\Delta^{\beta\delta}$ hexadiene, for which the pseudonym of "dienæstrol" has been approved by the General Medical Council. Unlike the natural oestrogens, stilbæstrol, hexæstrol and dienæstrol are effective *per os*. As was mentioned last year, stilbæstrol has been used in control of cancer of the prostate gland. Dienæstrol has proved very effective in relieving the distressing symptoms of menopause and in the termination of lactation without secondary effects.

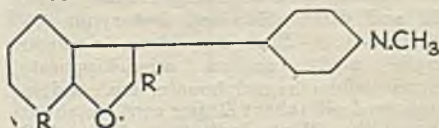
Bergel *et al.* (*J.C.S.*, 1944) have des-

cribed methods for the preparation of basic derivatives of benzofuran which have not been previously studied. The objective of these studies was the hope of finding analgesics among these substances, in the light of the fact that this fundamental grouping is implicit in the structure of the morphine molecule.



Structures other than benzofuran are implicit in the morphine molecule, and these have been explored by Small and others. For example, it was mentioned last year that Dodds (*Nature*, 1943) had found β -hydroxy- α : β -diphenylethylamine to be an effective analgesic when administered *per os* in preliminary trials. The work has since been published *in extenso* (*Proc. Roy. Soc. B.*, 1944). Further clinical investigation of this compound has shown that, so far from its being a universal analgesic, its effective action is limited to relieving pain due to pressure (*e.g.*, malignant growths) on nerves (*Nature*, 1944).

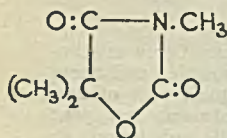
In the course of the work by Bergel *et al.* noted above, Eisleb's general method used in preparing 4-arylpiperidines was used in preparing a basic coumaran derivative of the type:



These workers also devised a new method (B.P. 550,963; 550,970; 556,976) of preparing the analgesic pethidine (1-methyl-4-phenylpiperidine-4-carboxylic acid ethyl ester) which avoided the use of the vesicant β : β -dihalogenodiethylmethylamine used by Eisleb (B.P. 501,135). Pethidine

continues to receive extensive trials and its field of application is becoming defined and limited. It is becoming clear that it is no general substitute for morphine although it has advantages in particular respects, especially where spasm of smooth muscle is involved. Its most severe limitation is that it is revealing itself as a drug of addiction and in some countries has been placed, as such, under the restrictions to which morphine is subjected. Woolfe and Macdonald have described a method for evaluating the analgesic action of pethidine hydrochloride, while Gallen *et al.* (*B.M.J.*, 1944) found it effective and satisfactory in combination with hyoscine as an obstetric analgesic.

Spielman (*J.A.C.S.*, 1944) has investigated the analgesic properties of derivatives of oxazolindione-2:4-dione, some of which have known hypnotic and anticonvulsant properties. He has found that alkylation of the N atom in 5:5-dialkyl derivatives introduces important analgesic properties and that, provided that the alkyl groups attached to the ring are of low molecular weight, there is no significant hypnotic effect. The outstanding compound was found to be 3:5:5-trimethyloxazolindione-2:4-dione, with analgesic properties in the aspirin and amidopyrin range. The preparation of this substance is described as an example in B.P. 561,183.



The S and N heterocyclic analogues of this substance were found to be without significant pharmacological action.

The introduction of 1-phenyl-2-benzoyltetrahydroindazolone as an analgesic was referred to last year, since when its preparation has been described in B.P. 565,816.

X-Ray Contrast Media

X-ray contrast agents depend upon their iodine content for their efficacy, this element causing relative opacity on account of its high atomic number. A number of preparations containing iodine are available for use as contrast media in various parts of the body, including Diodone (a mixture of 3:5-diiodo-4-pyridone acetic acid and diethanolamine), Iodoxylym (N-methyl-3:5-diiodo-4-pyridone-2:6-dicarboxylic acid), sodium o-iodohippurate, sodium iodomethansulphonate, etc.; iodised poppy-seed oil (about 40 per cent. combined iodine)—the *Oleum iodisatum* of the B.P. (Add. 1)—has had wide application in X-ray diagnosis of the genital tract, trachea and bronchi, spinal theca, etc. Iodised oil has, however, objectionable features in its variability and in the reactivity and consequent toxicity of iodine in aliphatic combination. Liberation of iodine in the spinal

canal is especially objectionable, and Strain *et al.* suggested the use of ethyl-p-iodophenylundecanoate (*J.A.C.S.*). The yield obtained by their method was too poor for commercial production and Wilson Baker *et al.* (*J.S.C.I.*, 1944) have devised a procedure the yields from which render commercial production practicable. Benzene is condensed with undecenoic acid in the presence of aluminium chloride to give the ω -phenyl derivative with isomerides. The product is iodinated in acetic acid solution in the presence of iodic acid and a little water. A certain amount of iodine enters the side chain which is objectionable. The procedure, therefore, involves steps to remove this aliphatic iodine, so that the product contains only stable nucleus-substituted iodine. The product is not entirely homogeneous but the contaminants are not objectionable clinically.

Disodium tetraiodophthalein (*Iodophthaleinum*, B.P.) has been in use for some time for rendering the gall-bladder opaque to X-rays (cholecystography). This substance has an unpleasant persistent taste which may cause nausea and vomiting when taken *per os*. This route is the preferred one as there are toxic reactions when it is administered intravenously. A method for removing the disagreeable colour, odour, and taste of this substance by bleaching with sodium sulphite followed by treatment with decolorising carbon is claimed in B.P. 562,889. In 1940, however, Dohrn and Diedrich (*Deut. Med. Woch.*) introduced α -phenyl- β -3:5-diiodo-4-hydroxyphenylpropionic acid for cholecystography and the product was marketed as "Biliselectan." This substance is tasteless, non-toxic and gives as good X-ray results as iodophthalein. In view of the cutting off of supplies from the continent, Wilson, Baker and Sansbury devised two methods of preparation (*J.S.C.I.*, 1944). In the first method *p*-hydroxybenzaldehyde is condensed with sodium phenyl acetate by means of the Perkin reaction, and the corresponding substituted acrylic acid is reduced to α -phenyl- β -4-hydroxyphenylpropionic acid. This substance is then iodinated readily with iodine monochloride in hot dilute acetic acid and an elaborate purification process follows. In the second method the more readily available anisaldehyde was subjected to the same series of reactions, the reduction being followed by a demethylation to obtain the desired substituted propionic acid for iodination.

Wilson Baker *et al.* (*J.S.C.I.*, 1944) have also examined the preparation and structure of another reputed cholecystographic agent, "Choloselectan." They bring evidence to bear that this is very crude 6:3':-5': tri-iodo-4'-hydroxy-2'-phenylquinolino-4-carboxylic acid which had previously been re-

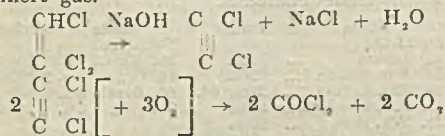
ported to give no X-ray visualisation; the substance causing the reported opacity must, therefore, have been an impurity.

Holling (*Lancet*, 1944) has explored sea-sickness remedies on behalf of the Medical Research Council. Two main groups of substances have been available: general sedatives and drugs of the belladonna class. Methedrine, sodium hydantoinate, hexobarbitone, and phenobarbitone were found to be ineffective. Three proprietary remedies were tested, the composition of which was as follows: (1) chlorbutol *plus* caffeine; (2) the dimethylpropanol ester of tropic acid *plus* dihydroxydiethylpiperidine; (3) hyoscyamine camphorate *plus* hyoscyne camphorate *plus* sodium bicarbonate. As a whole, proprietaries give poor results. In the belladonna group, atropine, hyoscyamine, and hyoscyne had significant effects. Hyoscyne in doses of 0.6-1.2 mg. was found most generally useful despite its causing dryness of the mouth.

Anæsthetics

As an anæsthetic, trichlorethylene is preferred to ether on account of its uninflammability; it is preferred to chloroform because of the lesser risk of ventricular fibrillation. It is not, however, without its own risks, and cases of paralysis of the trigeminal nerve and of liver necrosis have been reported. Recently, the hazards of using this gas in closed circuit have been brought out as a consequence of correlating this technique with cases of trigeminal paralysis, and it has been advised that trichlorethylene should not be used in closed circuit (*this Journal*, 1944, 51, 256).

Dr. H. E. Cox (*B.M.J.*, 1944) found that soda-lime used for absorbing expired carbon dioxide in closed-circuit anæsthesia may contain substantial amounts of free caustic soda, one sample examined by him containing 1.2 per cent., and another 11.2 per cent. He pointed out that when trichlorethylene is heated with alkali, dichloroacetylene is formed, and this is known to be highly toxic. Moreover, in the presence of air, dichloroacetylene decomposes explosively to phosgene and carbon dioxide and this may be avoided by excess trichlorethylene or an inert gas.



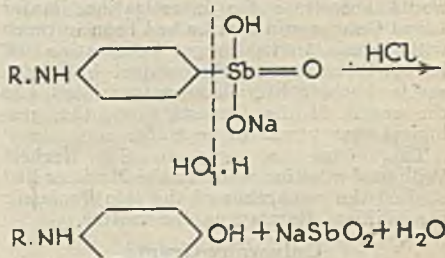
Naphthyl, indolyl, and pyrrol aliphatic acids have been much explored for their growth-promoting effects on the higher plants. They are now discussed (B.P. 560,967) in the light of their power of dissipating fatigue and stimulating bodily and intellectual activity in man. It is claimed

that their administration may usefully follow the administration of soporifics. These substances are slow-acting by themselves, but β -naphthyl-acetic acid, for example, together with caffeine, gives an instantaneous therapeutic effect.

Antimonials

Little has been known until recently concerning the fate of antimonials in the body. These drugs have been found particularly effective in the treatment of kala-azar, but their use is not without hazard. They may be broadly grouped according as they contain antimony in a tervalent or quinquevalent form. Among the tervalent compounds in use are potassium antimony^{III} tartrate, sodium antimony^{III} bis-pyrocatechol-3:5-disulphonate (Stibophen, Foundin), and lithium antimony^{III} thiomalate. The quinquevalent compounds are divisible into two sub-groups of which the first includes drugs of the emetic type—sodium antimony^V gluconate—and the second includes derivatives of phenyl-stibonic acid.

The latter sub-group has been highly developed and there may be mentioned, by way of example, the N-glucoside of *p*-amino-phenylstibonite (Neostam) and *s*-diphenylcarbamide-4:4'-distibonic acid (Urea Stibamide). The quinquevalent compounds are less toxic than the tervalent compounds; but it has long been assumed that, by analogy with the organometallic compounds containing arsenic, antimony is reduced to the tervalent form in the body and that it is the stibonoxide group, R-Sb=O, containing tervalent antimony which is parasiticidal. Goodwin and Page (*Biochem. J.*, 1943; *Nature*, 1944, 3902), support this assumption with evidence obtained by the use of their polarographic method for the estimation of antimony in biological fluids. This method has two advantages over previous methods in that it is of higher accuracy and distinguishes between tervalent and quinquevalent antimony. The reduction of antimony in the body, the authors think, is probably in accordance with the reaction suggested by Gray, following his *in vitro* experiments.



An important and comprehensive set of contributions by Wright, Henderson, and Banks, respectively, relating to the use of

chemotherapeutic agents in the treatment of tropical diseases, especially from the viewpoint of military requirements, is published in *Chem. and Eng. News* of August, 1944, and this will well repay careful study.

Postscript

A summary of information regarding the cost and output of American penicillin was made earlier in this article (January 13, p. 50). Since the author prepared his script further information has come to hand from American sources to the effect that the largest producer has recently reduced prices for 1 mega-unit of penicillin as follows: June, 1944, \$16.0; August, \$14.5; September, \$9.5. This particular manufacturer, with an output of 100,000 mega-units attained for the month of September, 1944, looks forward to an eventual price in the region of \$5 per mega-unit. It is further stated that the U.S. Government was still paying some penicillin producers \$60 per mega-unit in October; while no indication has been given, it is a reasonable conclusion that these latter producers are using a surface fermentation, whereas the largest producer, who has been able to reduce prices so sharply, is using the submerged mycelium technique.

Parliamentary Topics

Underground Gasification

IN the House of Commons last week, Mr. Higgs asked the Minister of Fuel and Power whether any progress had been made in this country with the underground gasification of coal.

The Minister of Fuel and Power: My Ministry, with the advice of the Fuel Research Organisation and the Geological Survey of the D.S.I.R., is studying this question in order to determine whether geological and other conditions in any of the coalfields in this country are such as to justify experimental trials of the process.

Asked whether he was aware that this process had been developed to some considerable extent in Russia, and whether he would accelerate the investigation, Major Lloyd George said that he had been in touch with Russia to try to get information. A lot of literature on the subject had been received which had all been translated. As the result of that investigation, the geological survey was to be made.

There was no reply to Sir Herbert Williams' question whether the Minister had studied the researches of the late Professor Sir William Ramsay on the matter.

University Grants

Replying to Mr. Salt and Sir E. Graham-Little, Sir John Anderson stated that the Government had decided to accept the

recommendations of the University Grants Committee that the present annual vote for the universities of £2,149,000 should be increased, for each of the next two financial years, by £2,000,000 for general purposes, £1,000,000 for developments in the medical schools, and £500,000 for the teaching hospitals.

Opencast Mining

Asked by Sir W. Edge, Major Lloyd George said that he could not make any reliable forecast regarding the continuation of opencast coal mining after the war, which depended among other factors on the extent deep-mine output proves capable of meeting demands.

Chemical Engineering School

"Shell" Gift to Cambridge

CAMBRIDGE University will, on March 2, be asked to accept, from the Shell group of oil companies, an endowment of £435,000 for the establishment of a School of Chemical Engineering. In addition, a sum of £2500 a year is to be made available for scholarships.

The group has been impressed, especially through its association with Holland and the U.S.A., by the fact that British universities are relatively ill-equipped to provide the increasing number of trained chemical engineers which British industry is certain to demand. It is suggested that best results will be obtained if the specialised study of chemical engineering is undertaken after a two-year honours course in natural sciences. It is proposed that, to begin with, the output of qualified graduates shall be about thirty a year.

LAC PRICES

The Ministry of Supply announces that the following prices for sales to consumers in the U.K. are effective from February 12. The prices are net per cwt. ex store, for quantities of not less than one bag. Further information may be obtained through the usual trade channels.

| Grade | Price | Grade | Price |
|----------------------|-----------|----------------|-------|
| SHELLAC | | SEED LAC | |
| 1. Lemon ... | 230s. | 8A. Kusml Fine | 195s. |
| 2A. F.O. Lemon 1... | 220s. | 8B. " No. 2 | 190s. |
| 2B. F.O. Lemon 2... | 212s. 6d. | 8C. Bysakl 3% | 175s. |
| 3A. F.O. Standard 1 | 205s. | 8D. " 5% | 165s. |
| 3B. T.N. Pure ... | 200s. | | |
| 4B. T.N. London Std. | 197s. 6d. | | |
| 5. Button lac ... | 215s. | | |

MACHINE MADE LACS

| | | | |
|---------------------|-----------|-----------------|-------|
| Garnet Lac A.C. ... | 195s. | Gamma ... | 205s. |
| " C.P. ... | 180s. | X.L. ... | 230s. |
| " I.G. ... | 175s. | D.G. ... | 210s. |
| A.B.T.N. ... | 230s. | D.L. ... | 265s. |
| Crown ... | 212s. 6d. | Blond ... | 235s. |
| C.V. ... | 212s. 6d. | Super Blond ... | 305s. |

SAFETY FIRST

Hazards of Contact with Chemicals

by JOHN CREEVEY

CHEMICALS, in the form of air-borne contamination, present a much greater hazard to the health of workers in the chemical and allied industries than does contact by accident. A man realises the risk of falling into a tank of acid, though it often happens that he does not seem to realise the danger of being negligent in some small matter which may cause a fellow-worker to slip and to fall into the same tank. For all hazardous chemicals, the danger of direct contact is mostly kept in view, although workers may be a little negligent as regards wearing items of personal protection such as goggles and gloves or a face mask. But the case of air-borne contamination by chemicals is different. The presence of some harmful chemical in the air may not be realised, or at least may not be obvious to the worker until it affects his health. The worker depends, in most cases, upon the guidance offered by those who control the works and the processes there, who in turn have often to be guided by professional safety experts. Nowhere in industry is there greater need for the co-operation of all persons concerned.

A Variety of Evils

Hazardous chemicals affect the human body in many different ways. Some cause irritation of the skin, giving rise to various skin diseases, and may also affect the membrane of the respiratory tract and of the eyes. These effects are found in the case of acid fumes, or of a very fine mist, carrying acid, or caustic chemicals, which are easily distributed by a current of air. Other chemicals may enter the lungs, where they are absorbed by the blood stream and lead to blood poisoning. They may affect the nervous system, or have a deleterious effect upon body tissue, as in the case of exposure to the vapour of benzene and of certain other industrial solvents. In other cases there may be asphyxia, resulting directly or indirectly from the entry of vapour into the lungs, as with hydrogen sulphide, carbon monoxide, or hydrogen cyanide; the latter is always considered as a deadly chemical, but probably not more dangerous than the other two, when their presence is unsuspected or at least not regarded as being in sufficient concentration. Carbon monoxide combines with the hæmoglobin of the blood and prevents the proper absorption of oxygen from the air; the other gases affect the nerve endings in the lungs, or the respiratory centre, and cause a cessation of the mechanism of breathing.

Dusts, carried in the air even in such small quantities as to be unsuspected, may exert ill-effects over a period of time; some dusts may be definitely poisonous when absorbed, while others, such as silica dust, choke the lung tissue or result in fibrosis, which predisposes to tuberculosis. Very often there may be a combination of ill-effects, as with the vapour of nitrobenzene, which affects the skin, leading to a form of dermatosis, and is also absorbed by the lungs, with the result of systematic poisoning.

The use of gas-masks and protective items of clothing in form of gloves, goggles, etc., is really a secondary measure in preventing such hazards, though they are often essential and extremely effective. In the first place, some attempt must be made to avoid, or least to control, the presence of chemicals in the air. Direct leakage can be avoided by constant and careful maintenance of plant, giving attention to all pipework, valves, glands of agitator shafts and pumps, manhole joints, in short wherever a gas-tight or liquid-tight connection is essential. Vapour arising from open tanks, where unavoidable, can be removed by a proper air exhaust system, not forgetting that mere exhausting does not always imply that there will be ventilation adequate to the needs of the worker in such situations, and ventilation needs must therefore be checked; in many cases proper ventilation by itself will remove the danger from small accumulations of vapour in the air.

Control of Dust

Artificial ventilation, badly distributed, or uncontrolled currents of air due to conditions existing at the works, resulting from a bad lay-out of the walls and doors of buildings, as well as by favoured exposure of hot pipes and furnace walls, give rise to currents of air which carry dust and mist far beyond the point where they arise. Where a dusty operation is in progress, it is well to watch for those places where the dust accumulates, and it will sometimes be surprising how far such a dust will travel, contaminating the air and providing a hazard to persons who have to breathe it. Partitions erected in predetermined positions will do much to increase the efficiency of any exhaust system; if dust troubles persist, it is well to try the temporary erection of partitions. The same applies in the case of a vapour whose presence is probably detected some distance from the point where it is produced. It will be found good to

connect up, in addition to the main point of exhaust, a small exhaust point close to each door or window, in the form of a length of pipe perforated with a single row of holes (like holes in a gas burner), fixed slightly above the top of the door and windows.

For the removal of most dusts, a velocity of 200 ft. per minute is needed at the point where they are produced; in the case of fumes and vapours, a lower velocity suffices, and for acid mists it may be still lower. Exhaust velocities from 100 to 150 ft. per minute have been found necessary to reduce the concentration of benzene vapour to a point below the safe limit of 100 parts per million. Acid mist may be cleared away at 100 ft. per minute, and sometimes at a figure as low as 25 ft. per minute. Depending upon the nature of the product to be removed, there should be either downward or upward exhaust. For hoods placed above open tanks, the needed velocity V at the edge of the tank (feet per minute), may be calculated from the formula $V = 0.7Q/PD$, where Q is volume of air to be moved (cubic feet per minute), P the perimeter of the tank (feet), and D the distance from tank to hood opening (feet).

In cases where vapour or dust may affect workers who are not connected with the process, but whose duties are situated close by, or perhaps in the path of an air current, the hazard of exposure can be reduced by isolating the process or operation. Even complete isolation may be possible, as in the case of the cabinet used in paint spraying, where the worker uses an enclosure which is ventilated and conducts his work by inserting the wrists and hands through an opening provided for the purpose and suitably placed, visibility being obtained through a window and by the interior lighting of the cabinet.

Medical Examination

Periodical medical examination of the workers is necessary if the possible ill-effects of contact with chemicals are to be detected quickly and kept under control; this examination is essential in the case of a process which is new, or where a process hitherto carried on on a small scale has been enlarged and prolonged. A slight change in a process may also bring new risks which have to be detected at the earliest moment. Slight intermittent symptoms of poisoning should be regarded with suspicion, as they may become serious when exposure is prolonged. The examination of workers does not remove the hazard; it merely assists in discovering hazards which are unsuspected, allows a record to be made of improved conditions or the reverse, and enables a worker to be put under immediate treatment when necessary, and at the same time removed from the hazardous

environment. Whether or not that worker eventually returns to his former job depends on circumstances in which medical evidence must be the deciding factor.

Handling Nitric Acid

Safety with Solutions and Fumes

ASKED whether a 15 per cent. solution of nitric acid would be dangerous to handle, and whether the fumes would be harmful, the Royal Society for the Prevention of Accidents gives the following opinion:

(1) Operatives ought not to have to handle a 15 per cent. solution of nitric acid for any period. Either the work should be arranged so that handling is unnecessary, or a barrier cream should be used in connection with an enforced washing routine. The cream should be one specially designed for nitric acid at this strength rather than a general, all-purpose cream. Experience proves that success with barrier creams depends about equally on (1) supplying the right cream, (2) allowing working time for its application and removal, and (3) supervising correct application and proper washing. On the whole, therefore, rearrangement of the process so as to prevent handling of the acid is the more simple and satisfactory method of protection in the long run.

(B) It is not possible to be positive about the effects of continuous exposure to low concentrations of nitrous fumes. They are, however, among the most insidious of all irritant gases, and are set free in a number of ways, e.g., by contact of the acid with organic matter and by exposure of even small quantities of acid to atmosphere. The removal of fumes at source by local exhaust is recommended. This is undoubtedly the only correct safety policy. The purely legal position is covered by Section 47 of the Factory Acts, which calls for steps to prevent inhalation of fumes or impurities if their character or extent is such as to be even likely to be injurious or offensive.

Methods for detecting nitrous fumes are given in "Methods for the Detection of Toxic Gases in Industry, Leaflet No 5, Nitrous Fumes" (H.M.S.O.; 3d.).

Celanese Corporation of America plans to produce rayon and other cellulose products in Mexico in a plant to be erected at Guadalajara, about 300 miles west of Mexico City. The new venture, to be called Celanese Mexicana, will have a share capital of \$6,200,000. American participation will extend over 51 per cent., and Dr. Camille Dreyfus, president of the American Celanese, will preside over the new company.

Chemical Progress in South Africa

DDT—Gelatine—Food Yeast

(From Our Cape Town Correspondent)

SINCE some recent developments in South Africa's chemical industry were described in this journal on December 9, 1944, advices just received from the Union state that technical difficulties involved in the manufacture of DDT have been overcome, and production taken up by New Clifton Manufacturers (Box 5099, Johannesburg). Supplies will be limited until the firm's larger production unit comes into operation. The DDT is sold, under a brand, commercially in bulk and in household-size containers. DDT has also received much publicity in the country.

Alcohol Distillation

A dry-ice plant is being erected at Umgeni, Durban, by Umgeni Distilleries. It was hoped that the plant would be in production in November, 1944, but owing to war-time delays, production has not yet started. The distillation plant at Umgeni is being overhauled so that, in addition to industrial alcohol and methylated spirits, it will be able to produce higher quality alcohols, such as rectified spirits and absolute alcohol. The manufacture of butyl acetate, acetone, ethyl acetate, amyl acetate, butyl alcohol, lacquer thinners and solvents will also probably be undertaken later in order to supply Natal coastal requirements and export demand.

Industrial Chemical Products (S.A.), London House, Johannesburg, are marketing two products of interest to gardeners. One is intended for use on rooted plants and contains vitamins which benefit the soil. The other, it is claimed, will force cuttings to root faster. Both products are manufactured in South Africa under licence from the American Chemical Paint Company.

Glue and Gelatine

African Fertilisers and Glue Works, Midway, Transvaal, now manufacture hide glue and gelatine. The raw material consists mainly of cattle skins and sinews. The skins are treated by a scientifically controlled preparation of milk of lime for periods varying from four to eight weeks. They are then thoroughly washed, and the hair removed. Then the skins are treated by boiling and a gelatinous solution is extracted. This solution is, under local South African climatic conditions, too weak for the desired purpose and is therefore concentrated in a vacuum plant, which allows a quick and efficient concentration at low temperature. After concentration, the liquid is allowed to cool until a jelly is

formed, which is sufficiently firm to be placed in a special cutting machine.

The resultant gelatine and glue cakes are placed on trays in drying tunnels, through which passes a stream of pre-heated air, regulated to the correct temperature, after which they are ready for sale, either in cake or granulated form. Both types compare in appearance and quality with the bulk of the gelatine previously imported. A further activity is the manufacture of bone glue. The bones are collected and crushed into an even granulation and charged into a benzene extraction plant, where the grease and moisture is removed. The benzene solvent is then recovered, and the residue—the bone grease—is put in drums and used for technical purposes, such as soap making. The degreased bones then undergo a mechanical and chemical cleaning process and are finally placed in pressure digesters, where the bone glue is extracted. The liquid residue then undergoes a concentration process similar to that of the hide-glue liquid. After the glue, greases, and moisture have been removed, the bones are finally dried and milled to bone flour. In compliance with war-time regulations, the bone flour can only be used as cattle feed. It has a very high medicinal and food value. As it contains mainly calcium phosphate it is also a very valuable fertiliser.

Shark-liver oil and its by-products, vitamins A and D, are to be manufactured in bulk by Union Coast Fisheries, 611 Security Building, Cape Town. This new company has taken over a fisheries business. It is expected that the new factory now being erected will be in production early this year.

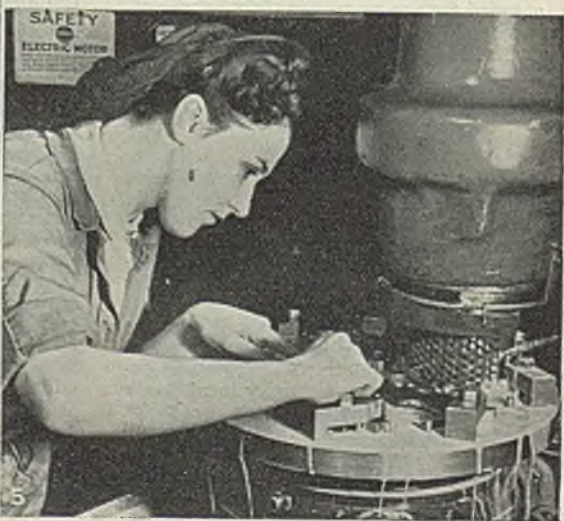
Research Service

Industrial concerns in South Africa needing the services of research chemists have been offered these by a new laboratory firm in Cape Town. Although this company is devoting a considerable amount of research work to problems connected with manufacturing processes of companies with which they are associated, such as the manufacture of edible oils, canned foodstuffs, textiles and clothing, the research facilities have also been offered to other firms. The laboratory also produces inks, including an edible ink for agricultural use.

Food yeast is now being produced in Durban on a semi-commercial basis by the Industrial Development Corporation in association with the Natal sugar industry. If this venture proves an outstanding success it is intended to erect a large plant.



PORT SUNLIGHT AT WAR



LETTER TO THE EDITOR**Scientific Publicity**

SIR,—I think you have raised a very important point in your leader of January 27, and everyone will agree with you that the veil of secrecy, which for obvious military reasons during the war has surrounded the activities of the chemical industry in Great Britain perhaps more than those of any other industry, is going to do a lot of harm to our export trade unless there is a drastic change of policy soon.

But there are two other aspects of this problem in which your readers may be interested:—

(1) The chemical industry depends, probably more than any other, on the quality and mentality of the people who work in it. For the future development of this industry it will therefore be of importance to attract the right type of young man. From this point of view a lack of publicity is a great disadvantage, for the chemical industry does not catch the imagination of the young man making up his mind about his studies and the choice of an occupation. To my mind this is a greater danger for the future of the industry than any other technical or political difficulty. Many examples of the past fifty years have shown that these can be overcome, provided that the right people with the right mentality have their say in industry. A young man's mind is not interested only in past achievements; it is liable to be more fascinated by the way in which important problems of the day are tackled and also by a glimpse of the big problems which have to be solved in the not too distant future.

(2) The second grave danger seems to me to be that, after so many years of secrecy

imposed to a large extent by the necessities of war, lack of publicity may become a habit, which would be bound to hamper the progress of the industry (quite apart from the obvious disadvantage for export mentioned in your leader). Such a lack of publicity may lead to waste of time and effort through several laboratories working at the same time along the same lines on the same problems without knowing each other. Many chemists or leaders of chemical industry will lack the inspiration of the knowledge on broad lines of what is being done in other sections of the industry and, above all, the inspiration of detailed statistics. The chemical industry in this country must look with envy on such excellent and frank reports as those issued by the U.S. Rubber Director on August 31 last, which not only gave a great amount of statistical data and facts but also forecasts of future developments.

The chemical industry has now definitely passed the stage in which carefully guarded secrets, passed on from father to son, were the backbone of success; it has become an industry where very quick changes are taking place and where, more than in any other industry, science and research have a say. It would therefore be regrettable if the necessary war-time secrecy were to continue to influence the industry in future. The days of the alchemist are gone for ever: the chemical industry, like any other great industry, must work in the open and appeal to a wide range of consumers, by telling them what has been achieved, what is being done, and what it is hoped to do in the future—just as its products have to be sold on specifications, analyses, and tests.—Yours faithfully,

F. KIND.

PORT SUNLIGHT AT WAR

STORIES of the war-time activities of the great manufacturing concerns of the country are none by one being released. Not the least remarkable of these is the tale of the achievement of the works of Lever Brothers, Port Sunlight, which was illustrated by an exhibition open to the public in the first half of February, typifying the time-honoured British talent for marrying skill with improvisation. Port Sunlight is associated in the public mind with the manufacture of soap, and soap is in itself a munition of war; but at the same time the immense manufacturing potential of Port Sunlight was required to devote itself to the output of more directly warlike munitions. Girls possessed of high manual dexterity perfected in "luxury" jobs were trained to become skilled engineers, and they have turned out such articles as tank periscopes, cylinders for shells, and electrical components, as well as the massive undercarriages for Lancaster bombers. Others have engaged in the assembly of motor vehicles. Others again, formerly concerned with the packing of soap for export, have put up 2,300,000 composite rations for the armed forces, including "Pacific" and "Jungle" packs. The illustrations opposite give some idea of the diversity of the work undertaken, and the satisfied zeal of the workers engaged.

1. Checking a heavy milling operation on a bomber undercarriage. 2. A corner of the exhibition. 3. Types of rations, packs, and printing plates made at Port Sunlight. 4. Soldering lids of master-tin containing "Jungle" packs. 5. Milling locks for bomber undercarriages.

Personal Notes

PROFESSOR E. K. RIDEAL was unanimously appointed chairman of the Chemical Council at the meeting held on January 17.

LORD SAMUEL and MR. E. W. SALT, M.P., were re-elected President and Chairman of the Parliamentary and Scientific Committee.

MR. FRANK MOBBY, B.Sc., has been appointed Assistant Lecturer in Metallurgy at Manchester University.

LORD LEVERHULME has accepted the invitation by the Society of Chemical Industry to deliver the Society's Medallist's address for 1945.

MR. R. G. LONGCROFT has been appointed chairman of Trinidad Central Oilfields, Ltd., in place of the late Mr. Alexander Duckham.

DR. H. T. OPENSHAW, DR. A. G. EVANS, and DR. T. H. H. QUIBELL are promoted Lecturers in Chemistry at Manchester University, the promotions to take effect from September, 1945.

MR. E. B. ANDERSON has accepted nomination as honorary secretary of the Society of Chemical Industry. He is also to represent the Society on the Parliamentary and Scientific Committee in place of DR. H. J. T. ELLINGHAM.

MR. EDWARD BLUM, chief of the Electrochemistry Section, U.S. Bureau of Standards, has been awarded the E. G. Acheson Medal and \$1000 prize of the Electrochemical Society for his work on the standardisation of electroplating methods and of plating formulæ.

SIR RICHARD GREGORY, F.R.S., is head of a committee which has been formed with the aim of getting the district of Pagham Harbour, Sussex, scheduled as a nature reserve. The preservation proposal is supported by the South-Eastern Union of Scientific Societies, as well as by the British Empire Naturalists' Association.

The M.B.E. has been awarded to MR. W. R. G. BREW, branch engineer, and to MR. L. J. HALL, officer-in-charge, works fire brigade, both of the Burmah-Shell Oil Storage and Distributing Co., for their gallantry in fighting the serious fires which occurred on April 14, 1944, following a series of explosions in Bombay docks.

MR. J. C. F. FRYER, secretary of the Agricultural Research Council, has been appointed to the Colonial Products Research Council, in succession to the late Dr. W. W. C. Topley, while PROFESSOR H. V. A. BRISCOE, head of the Department of Inorganic and Physical Chemistry at Imperial College, succeeds the late Sir John Fox on the same Council.

Obituary

MR. THOMAS PATON, who died in Glasgow on February 2, was a representative of the Manchester Chemical Company, Ltd., and well known in the Glasgow chemical trade.

It is with great regret that we announce the death in a London hospital, on February 12, of MRS. JEAN CRICHTON CULLEN, O.B.E., wife of Dr. William Cullen, to whom his many friends in the chemical world, both in this country and overseas, will extend their heartfelt sympathy.

We regret also to announce the death, on February 5, of MRS. E. A. RONCA, wife of Mr. J. F. Ronca, O.B.E., A.R.C.S., A.R.I.C., who served for many years as a Gas Referee and as Director of Gas Administration. He was president of the Chemical Club in 1935-37.

MR. CHARLES KINGSTON EVERITT, chairman of Edgar Allen and Co., Ltd., Sheffield, has died at Grindleford, Derbyshire, aged 78. He was the first president of Sheffield and District Engineering and Steel Trades Council, and had served as president of Sheffield Society of Engineers and Metallurgists, and the Steel-Melting section of Sheffield Trade and Technical Society. He introduced into Sheffield the high frequency electric crucible process of making fine tool steels.

MR. AUGUSTE DE BAVAY, who died at Melbourne, Australia, on November 16, aged 88, was trained as a chemist at the Institut Pasteur in Paris, but went to Australia from his native Belgium sixty years ago. He was the inventor of the de Bavay process for the recovery of zinc from blende by flotation, which solved the problem of separating sulphides from the gangue and was one of the greatest steps in the advance of the Australian base-metal mining industry. In the last war he developed a process for producing acetone for cordite manufacture, and established the Commonwealth acetate-of-lime factory on the Brisbane river. He also played a leading part in the foundation of the Australian paper-making industry.

Bulletin No. 25, just issued by AERO RESEARCH, LTD., of Duxford, Cambridge, presents a summary of essential information about the properties and behaviour of Aerolite (urea-formaldehyde) and Aerodux (phenol-formaldehyde) glues and their method of use. The bulletin comprises 20 pages of useful data, with tables giving particulars of Assembly Glues and Plywood Glues, as well as of the hardeners for use with such glues. Later sections give more detailed notes on the characteristics of particular types of glue. Sales inquiries should be addressed to J. M. Steel & Co., 36 Kingsway, London, W.C.2.

General News

From Week to Week

Four new specifications, DTD, deal with solution-treated aluminium alloy sheets and coils (Nos. 546A, 603A, 610A, 646A; 1s. each), while No. 923 covers chromate passivation of zinc surfaces (6d.)

It is proposed to form a new Industrial Safety Group in the Derby area, as a result of a meeting held on January 30. The newly-formed Nottingham Group is to hold its first meeting shortly.

An illustrated leaflet, showing the share of George Kent, Ltd., Luton, in Britain's war effort has just been issued and will be followed, after the end of the war, by a full account of the company's manifold activities. The leaflet has been distributed to all employees and to employees in the Forces.

A reduction in the price of aluminium is being considered by the Government, states the *Financial News*; this step would assist in the absorption of excess productive capacity and promote exports. World annual capacity now exceeds 2,000,000 tons, against less than 600,000 tons before the war.

A new Nottingham company, Farnsworth Products, Ltd., with offices at Albion Chambers, King Street, has now obtained factory premises and is reported to have acquired the benefit of certain formulæ relating to plastic substances suitable for use in the manufacture of sectional buildings, etc. Mr. J. R. Farnsworth, the managing director, is the inventor of a suitable plastic material, known as "Farn-o-lite," which, he states, has been improved and lightened without impairing its tensile strength.

Copies are now available of the first of the booklets in the "Hints to Business Men" series, prepared by the Department of Overseas Trade. Those already available cover the U.S.A., New Zealand, and British East Africa, and can be obtained free of charge from the D.O.T., Hawkins House, Dolphin Square, S.W.1. These booklets give information about markets such as notes on population, currency, usual methods of payment, sales organisation and customs formalities, as well as hints on travel and accommodation.

Loads of carbon black have been giving trouble to Liverpool carriers, who have had difficulty in cleansing the wagons after use. Employees also, owing to the damage sustained by their clothing when they handle this traffic, have asked to be compensated by the payment of what is known as "dirt money." Others are less concerned about dirt money than by the difficulty of obtaining additional coupons to permit the purchase of new overalls. It is understood that representatives of the men's union have put the case to the Area Road Haulage Officer.

Special commendation is awarded, in the February issue of the *Chemical Worker*, to the new convalescent home established at Rhos-on-Sea by the Clayton Aniline Company, and to the canteen and welfare arrangements of Allen & Hanbury, Ltd., and the suggestion is made that other firms in the chemical industry might go and do likewise.

It is regretted, states the registrar and secretary of the Royal Institute of Chemistry, that the name of Professor Alexander Robertus Todd appears on the balloting list for election of Council as "Archibald" instead of "Alexander." Fellows and Associates will gather from the list of candidates for election to the Council that the candidate referred to is Professor A. R. Todd, F.R.S., Professor of Organic Chemistry, Cambridge University.

An enthusiastic reception was accorded Sir Alexander Fleming when he lectured recently on penicillin in the Great Hall of Leeds University. As well as an account of the discovery and development of the drug, Sir Alexander spoke with some irony of the popularity it now enjoyed, and warned his large audience that "manufacturers are going to get away with it for a while. . . . They put it in toothpaste; they might get away with penicillin lipstick." He contrasted this recent fame with the years of work that had gone into the early experiments.

The story of the discovery of the synthetic oestrogens by himself and his team was the subject of a lecture given to the Cambridge University Chemical Society by Professor E. C. Dodds, F.R.S., heard by a most appreciative audience. Their success in finding, after great difficulties, a simpler and even more active compound than the German-owned synthetic female hormone, oestriol, and the synthesis of the oestrogens (some account of which appears on p. 157 of this issue), which are now made industrially, a fascinating story in themselves, were made doubly interesting by Professor Dodds's brilliant exposition.

The popular view of the man of science as "devoid of humour and a stranger to the humanities" was refuted by Dr. John Read, F.R.S., Professor of Chemistry at St. Andrews University, in a lecture last week to the University of Edinburgh Chemical Society. He urged that the specialised outlook which was becoming increasingly bound up with the trend of contemporary research should be alleviated by the cultivation of an interest in the broader humanistic aspects of science. Happily, the industrial chemist, with his continual human contacts, is less likely to lose his sense of humour than is his academic colleague.

A memorandum has been submitted by the Bradford Education Committee to the Percy Committee on Technical Education, contending that Bradford Technical College could not, under existing conditions, develop into a higher institute of technology, and claiming that, since the college has for over 50 years maintained full-time work of university standard, it should receive university status and be able to award first and higher degrees. If necessary, an arrangement could be effected, either with an existing university, or by connecting a number of institutes to constitute a Federal University of Technology.

Foreign News

Spain's sulphur output totalled 32,000 tons last year. Production is to be increased in order to meet the growing demand by the synthetic fibre industry.

Monazite sand from the beaches of New South Wales and Queensland, has been successfully employed in an improved polishing powder for lenses and prisms used in optical munitions.

The Oil Technologists' Association (India) has recently been formed by oil technologists and oil mill owners to promote the oil and allied industries, the knowledge of oil chemistry and technology. An official organ, *The Oil Technologist*, is to be published.

Mysore Iron and Steel Works are engaged in work relating to the manufacture of phenol-formaldehyde plastics and urea-resin plastics and also in the manufacture of plastics from coffee beans and furfural from rice husks.

Johannesburg firms are making liquid nail polish in various shades, and white shoe cleaner; also medicinal confectionery, lozenges and pastilles. A Cape Town firm of floor and car polish manufacturers is making a milking salve and selling it under a brand name.

In Ceylon, post-war development plans provide for additional funds for industrial investigation and research. It is stated that vast quantities of equipment and many technicians will be needed. The immediate erection of a first-class workshop for the construction of industrial and chemical plant at a cost of Rs.2,000,000 is being urged by the Director of Commerce.

From the Punta Arenas district of Chile comes the report that, in connection with exploratory work for oil deposits which has been proceeding in that district for some considerable time, it is understood that shipments will shortly be made of heavy equipment for drilling, etc., purchased in the U.S.A. There is reason to expect that oil will be found at from 5000 to 7000 feet, and that preliminary drillings will be made near the sea coast.

A revised schedule of the prices of sulphuric acid in various areas of India, effective from December 15, 1944, is published in the *Indian Trade Journal*, December 21, 1944, p. 354.

To increase supplies of oil from British-controlled sources in the Middle East, a considerable extension of existing refineries and the erection of new plants in the Persian Gulf is planned. At least 300 skilled men from Britain will be required to construct, equip and maintain the new works.

Important asbestos deposits have been located in the State of Goyaz, Brazil, in an easily accessible area of about 100 hectares, at a place called Araras, about 20 kilometres from Morrinhos. The varieties include the amphibole and the fibrous serpentine (chrysotile), in addition to the purest and whitest kinds of asbestos.

A scientific research board to "ensure continual preparedness" has been established in the U.S.A. to continue the co-operation between civilian scientists and the Services, it is announced. Mr. Karl T. Compton, president of the Massachusetts Institute of Technology, is to be head of the executive committee, and the board will consist of 17 civilian scientists and 9 representatives of the Army and Navy.

In Soviet Russia the use of glass "ribbons" in the manufacture of light and durable products has been advantageously demonstrated. It is claimed that the material has been found comparable to steel. Experiments have been conducted at pilot plants set up by the Institute of Crystallography. A new machine produces these ribbons 80 centimetres wide and to any desired length. Its chief application is, at present, with reinforced concrete.

Forthcoming Events

February 17. The Institution of Chemical Engineers (North-Western Branch). The College of Technology, Manchester, 3 p.m. Mr. J. A. Storrow: "Fractionation of Binary Mixtures in a Wetted Wall Column."

February 17. Society of Chemical Industry (Liverpool Section). Chemistry Lecture Theatre, University of Liverpool (Brownlow Street entrance), 2.30 p.m. Jubilee Memorial Lecture. Dr. L. A. Jordan: "Paint—the Art and the Science."

February 17-18. The Association of Scientific Workers, Caxton Hall, Westminster, S.W.1. Conference: "Science in Peace." February 17, 2.15 p.m., "Science and Production." Chairman: Professor P. M. S. Blackett, F.R.S. February 18, 10 a.m., "The Future Development of Science." Chairman: Sir Robert Watson-Watt; 2.30 p.m., "Science in Everyday Life." Chairman: Professor H. Levy, F.R.S.E. Con-

ference tickets are 5s. for the three sessions, or 2s. 6d. per session, and can be obtained from: Mrs. B. Rycerson, Association of Scientific Workers, Hanover House, High Holborn, W.C.1.

February 21. British Society for International Bibliography. Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, 2.30 p.m. Mr. E. M. Bennett: "The Classification of Inventions Disclosed in United Kingdom Patents Specifications"; Mr. H. Rottenburg: "Towards a Revision of the Engineering Section of the Universal Decimal Classification."

February 23. The Institute of Fuel. Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, 10 a.m. Joint conference with the National Smoke Abatement Society on Atmospheric Pollution. Morning session: The Problem; chairman: Sir Lawrence Chubb. 1.30 p.m., afternoon session: The Prevention of Pollution; chairman: Dr. E. W. Smith.

February 24. The Association for Scientific Photography. Caxton Hall, Westminster, S.W.1, 2.30 p.m. Messrs. D. R. Barber and E. H. Amstein: "Factors Influencing the Choice of Photographic Materials for Use in Quantitative Spectrography."

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.)

RUBBER & TECHNICAL PRESS, LTD., London, S.W. (M., 17/2/45.) January 22, £25 debentures, part of a series already registered. *£325. September 1, 1944.

SILICA GEL, LTD., London, W.C. (M., 17/2/45.) January 22, mortgage to Midland Bank, Ltd., securing all moneys due or to become due to the Bank; charged on contract moneys. *£1776. November 29, 1944.

DURASPRAY, LTD., London, W.C., specialists in a rustproofing process. (M., 17/2/45.) January 25, £3000 debentures; general charge. *£2500. November 12, 1943.

KEINER & CO., LTD., Mitcham, chemists. (M., 17/2/45.) January 19, mortgage to Midland Bank, Ltd., securing all moneys due or to become due to the Bank; charged on Crewes Place (formerly

Crewes Farmhouse), Warlingham, with out-buildings and pieces of land and fixtures. *£1400. January 11, 1943.

Company Winding-Up

ITABIRA IRON ORE CO., LTD., London, E.C. (C.W.U., 17/2/45.) January 22.

Company News

The International Nickel Co. of Canada, Ltd., has declared a quarterly dividend of 40 cents.

Southern Tar Distillers, Ltd., 25/28 Buckingham Gate, S.W.1, have changed their name to Flushiemere Barytes Mines, Ltd.

Frigonia, Ltd., 35 New Broad Street, E.C.2, have increased their nominal capital by the addition of £2500 beyond the registered capital of £1000. The additional capital is divided into 2500 7½ per cent. non-cumulative £1 preference shares (non-redeemable). The 200 ordinary 10s. shares have been sub-divided into 2000 of 1s.

Chemical and Allied Stocks and Shares

STOCK markets have continued firm, with a rising trend in British Funds and industrial shares, although there was again no marked increase in the volume of business. Buying of industrials was selective and stores shares, including Boots Drug, which rose sharply to 55s. 6d., were favoured on hopeful views of post-war prospects. The units of the Distillers Co. were also good at the higher level of 112s. 3d., while United Molasses at 38s. and British Plaster Board at 39s. 9d. have been well maintained.

Imperial Chemical eased to 38s. 7½d., but Dunlop Rubber showed firmness at 48s. 9d., partly on the news that the company is leasing a Government factory near Liverpool. Borax Consolidated moved higher at 37s. 10½d., awaiting the dividend announcement, and Lever & Unilever at 47s. regained an earlier small decline. B. Laporte kept firm at 86s. 3d., with W. J. Bush 75s., British Drug Houses 31s. 3d., and Burt Boulton higher at 25s. 6d. Greiff-Chemicals 5s. ordinary were again 8s. 9d., Fisons 51s., and Monsanto Chemicals 5½ per cent. preference 23s.

Courtaulds strengthened to 55s. 3d. No change is generally expected in the dividend due to be announced in a few weeks, but the results and annual statement are being awaited with perhaps more than usual interest on this occasion in the market, where there has been a revival of rumours of developments between the company and British Celanese. British Celanese 10s.

ordinary have been active but showed sharp fluctuations, moving back to 33s. after touching close on 34s. Textiles generally remained firm, with Bradford Dyers good at 27s. 3d. on the possibility of a slightly higher dividend.

Iron and steels were also better, which changed, with United Steel 25s. 9d., Stewarts & Lloyds 58s. 3d., Tube Investments £5½, Guest Keen 37s. 9d., and Allied Iron 52s. Babcock & Wilcox rallied to 53s., Staveley Coal to 53½. 6d., with Dorman Long better at 28s., and the preferred ordinary 53s. 9d. Various shares connected with base metals were inclined to improve, including Amalgamated Metal (18s.) and Imperial Smelting (13s. 3d.). Elsewhere, General Refractories kept steady at 17s. 1½d., while Metal Box shares were again 90s. 7½d., and Murex 101s. 3d. British Oxygen strengthened to 84s. British Aluminium at 45s. 10½d. were virtually the same as a week ago. International Paint continued steady at 115s., awaiting the results, Pinchin Johnson were 39s., and Lewis Berger at 110s. moved higher among paint and kindred shares, while Goodlass Wall 10s. ordinary also improved to 19s.

Associated Cement remained at 63s. Elsewhere, Powell Duffryn held their recent improvement to 24s. De La Rue were again 186s. 3d., British Industrial Plastics 2s. shares 6s. 1½d., and Erinoid 12s. Thomas & Baldwins eased to 12s. 7½d., and Baldwins (Holdings) to 6s. 9d. Parkinson & Cowan changed hands up to 21s., and Cannon Iron Foundries up to 18s. 3d. United Glass Bottle were 73s. 9d., Canning Town Glass 5s. ordinary 9s. 9d., Forster's Glass 37s., and John M. Newton 1s. ordinary changed hands at 7s. 9d., shares of companies connected with the glass industry tending to attract more attention on post-war prospects. Morgan Crucible 5½ per cent. preference marked 27s., and the second preference 24s. 4½d. Triplex Glass were 42s. 9d.

Elsewhere, Sangers were 30s., Timothy Whites 40s. 4½d., and Beechams deferred strengthened to 18s. 9d. Wall Paper deferred moved slightly lower at 41s. 6d. Among oils, Anglo-Iranian strengthened to 113s. 1½d., and the general tendency was firm, with Trinidad Leaseholds improving to 96s. 3d., and Trinidad Central 10s. units moving up to 18s. W. B. Dick (Holdings) shares rose to 26s. on the pending merger developments referred to in the directors' statement.

British Chemical Prices

Market Reports

A FAIR movement of supplies of general chemicals in the London market has been reported during the past week and fresh inquiries have been on a moderate

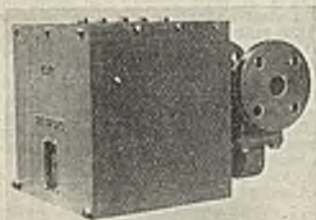
scale covering a fairly wide range. Steady price conditions are reported and the undertone throughout the market remains firm. In the soda products section there has been a steady inquiry for industrial refined nitrate of soda, while a moderate trade has been passing in acetate of soda and nitrate of soda. Interest in soda ash, Glauber salt and salt cake has been maintained at recent levels and deliveries have been steady. Bichromate of soda has met with a good inquiry and offers are fully absorbed, while the tight supply position continues for chlorate of soda and yellow prussiate of soda. Values are well held for hyposulphite of soda and a steady demand for both grades has been reported. Among the potash chemicals, supplies of solid caustic are moving steadily into consumption, while liquid caustic remains scarce. Inquiry for bichromate of potash is persistent and offers are finding a ready outlet; this applies also to yellow prussiate of potash. There is a steady demand for acid phosphate of potash. Among the miscellaneous chemicals, powdered arsenic and sulphur are firm sections, with supplies readily taken up, while alum lump has been the subject of fresh inquiry. A steady trade is passing in both crude and refined glycerine, and hydrogen peroxide is a good market. Quotations for red and white lead are maintained and a good demand is reported. In the market for coal-tar products a steady demand for pitch is reported for the home market. Carbolic and cresylic acid are in good request and a moderate business is reported in the pyridines. The toluols and benzols are steady.

MANCHESTER.—Reasonably steady trading conditions have been indicated during the past week on the Manchester chemical market. New inquiry and actual additional business have been moderately active and a satisfactory feature is that the extensive orders already placed are being steadily drawn against by the leading industrial users. Products for which a good outlet is reported include caustic soda, bicarbonate of soda, and other soda compounds, the general run of potash chemicals, the ammonia products, and sulphuric, hydrochloric, and most other acids. In fertilisers, the tendency is towards a brisker demand, though this is not by any means at its peak in several sections. The tar products generally are very firm and a steady trade is passing in crude tar, creosote oil, carbolic acid, and benzol.

GLASGOW.—In the Scottish heavy chemical trade during the past week home business has shown a decided improvement. Export trade is still rather restricted. Prices remain steady.

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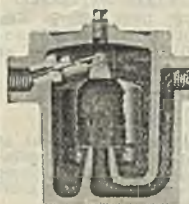
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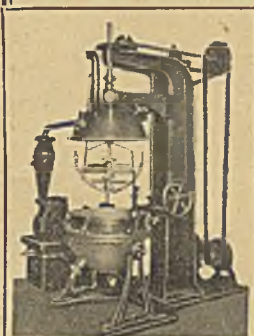
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