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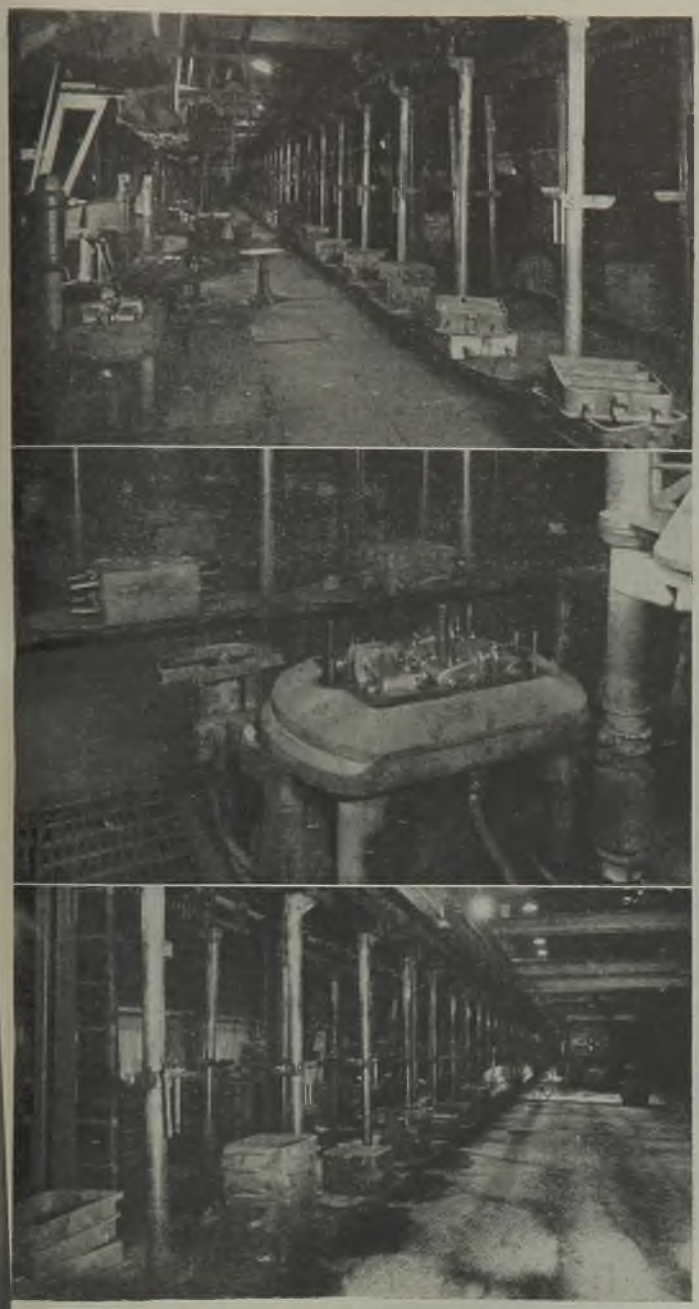

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Scottish Laboratories:—Foundry Technical Institute, Meek's Road, Falkirk. (Phone: 372.)

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## Sharing the Post-war Pie

Mr. Donald J. Reese, who has been lent by the International Nickel Company to the [American] War Production Board, has some interesting views on the prospects for the grey-iron industry in the post-war world. These he expounded to a meeting of employers who had assembled for the definite purpose of discussing post-war planning. Mr. Reese seemed to be a little worried at his inability to establish the melting capacity of the grey-iron industry, perhaps on account of the publicity given to this figure in other fields. We feel it to be immaterial, as it is so very easily expanded at a comparatively small cost. What does matter is the provision of men and machines to handle the metal melted, for man-power shortage is the most pressing need at the moment in most American foundry centres. On the other hand, Mr. Reese points out that there are cupolas installed which, if properly worked, could each melt 500,000 tons a year.

"The interested public only learns about a material or an industry from the information released by that industry." This phrase was the keynote of the address, and references to the American equivalent of such bodies as development departments of the copper, nickel, aluminium, plastics and other interests, which do so much propaganda to popularise extended use of their products, brought into relief the difficulties of similar action by ironfoundries. In this case there are several thousands of makers, who as individualists find difficulty in sponsoring a permanent organisation devoted to commercial developments, due no doubt to internal competition.

A better recognition that the industry as a whole is in competition with other industries is essential for maintaining or increasing post-war production. A second necessity is that foundrymen should know more about their own industry, for Mr. Reese is of opinion—and it is a viewpoint which we share—that a manufacturer of rolls knows virtually nothing about bath-tub making and *vice versa*. It is suggested that when foundrymen visit engineering shops, they should quiz engineers as to what the latter know about cast iron, and iron castings. Reese suggests that the factual information will be quite meagre. All the above points to the necessity of enlightened publicity as to the potentialities of that very comprehensive series of alloys entering into the classification of cast iron.

Available business is likened by Mr. Reese to a pie, and foundrymen, like all other businessmen, wonder from time to time whether or not the pie is getting larger or smaller and whether they are getting their fair share. An intensive search has convinced Mr. Reese that in the last 30 or 40 years the pie has been getting larger. As for the post-war pie, the lecturer gave consideration to the competition to be expected from light metals and plastics. In his survey of magnesium, the lecturer concluded with a doubt as to whether this metal as a competitor in the post-war engineering field would put up a great fight, but because of its place in expanding the national business level would create new markets for cast iron. Plastics, the raw materials for which are said to cost something of the order of £100 a ton, will but bring about a "mild skirmish" and, like magnesium this industry, too, will expand the market for grey iron.

In dealing with aluminium, the lecturer rather interestingly went from the general to the particular and cited the case of motor-vehicle pistons. In this case it has been prophesied that the increase in the use of aluminium in the post-war car would be 35 lbs. This would involve a loss to the Ameri-

(*Continued overleaf, column* 1.)

## Contents

## BOOK REVIEW

**Principles of Magnetic Crack Detection,** by H. Bevan Swift, A.M.I.E.E. Published by E. & F. N. Spon, Limited, 57, Haymarket, London, S.W.1. Price 10s. 10d., post free.

No doubt the routine examination of engineering components by X-rays and the like has aroused widespread interest in non-destructive testing in general. Ranking high in popularity in this field is magnetic crack detection. The literature on this subject is not extensive, and operatives will welcome the publication of this small book, the cost of which seems to the reviewer to be a little on the high side, as it only runs to 105 pages. However, it does cover the ground very satisfactorily by giving all the essential information, whilst omitting the more involved mathematics of the subject.

The final chapter—number 9—is perhaps the most interesting, as it deals with the mechanism of crack detection department. It does not, and indeed it could not, describe an ideal layout, but it does draw the attention of the executive to the variety of conditions which arise in industry. One suggestion is the installation of a testing machine in the stores where castings are received from the foundry. Why not in the despatch department of the foundry? This type of book dealing with a restricted subject appeals to the reviewer as being distinctly preferable to one chapter in the larger text book.

V. C. F.

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**Mr. Dimos Drimiotis,** of 5, Sparta Street, Nicosia, Cyprus, is opening up an import agency covering pig-iron, non-ferrous metals, crucibles, refractory materials, coke, grinding wheels, blacking, etc., and would like to establish contact with firms interested in the extension of their post-war export business to Cyprus.

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## SHARING THE POST-WAR PIE

(*Continued from previous page.*)

can ironfoundries of something of the order of a quarter of a million tons annually. Logically this must be based on strength-weight ratio. The military authorities in 1943 sought to improve the grey-iron piston rings used in aircraft. The ironfoundry industry responded by giving a ring of the same weight, but showing a 50 per cent. improvement in the mechanical properties. This leads Mr. Reese to believe that a similar strength-weight ratio could be attained for pistons and so save this production for the ironfoundry. Whilst we are full of admiration for Mr. Reese's fight for the stake of cast iron in the post-war pie, we think a still better helping could be assured if the whole of the foundry industry pooled their resources for the general popularising of castings as a whole.

## FORTHCOMING EVENTS

DECEMBER 15.

*Institution of Mechanical Engineers*:—General meeting at Storey's Gate, S.W.1, at 5.30 p.m. Papers on "Some Considerations in the Design of Class 1 Pressure Valves," by E. J. Heeley, and "A Note on Design Stresses in Class 1 Pressure Vessels," by S. F. Dorey, D.Sc., M.I.Mech.E.

*Keighley Association of Engineers*:—Foundry lecture at Devonshire Buildings, Keighley, at 7.30 p.m.

### Institute of British Foundrymen

DECEMBER 9.

*Bristol Branch*:—"Moulding Sands and Gases in Relation to Casting Defects," by G. W. Nicholls. At the Grand Hotel, Broad Street, Bristol, at 3 p.m.

*Lincoln Section*:—"Discussion of Problems in Jobbing Ironfoundries," by A. E. McRae Smith. At the Technical College, Lincoln, at 3 p.m.

*Scottish Branch*:—"The General Principles of Rate Fixing as Applied to Aero Engine Foundry Practice," by James Colville. At the Royal Technical College, George Street, Glasgow, at 3 p.m.

*West Riding of Yorkshire Branch*:—"The Determination of Liquid Metal Temperatures and the Range of Solidification in Cast Iron as a Foundry Control," by R. C. Tucker, M.A. At the Technical College, Bradford, at 6.30 p.m.

DECEMBER 16.

*East Midlands Branch*:—"Some Interesting Examples of Loam Moulding," by R. D. Lawrie. At the College of Technology, Leicester, at 6 p.m.

DECEMBER 18.

*Sheffield Branch*:—"Initial Experience in the Operation of the Hydro-blast Process in a Steel Foundry Fettling Shop," by F. N. Lloyd. At the Royal Victoria Hotel, Sheffield, at 7 p.m.

DECEMBER 22.

*Falkirk Section*:—"The Development and Production of Inoculated Cast Iron," by H. P. Hughes. At the Smoke Room, Temperance Café, Lint Riggs, Falkirk, at 7 p.m.

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## U.S. MEEHANITE RESEARCH INSTITUTE

The 16th annual meeting of the Meehanite Research Institute of America, Inc., New Rochelle, N.Y., was attended by about 200 representatives of the member foundries. The meeting was held at the Hotel Commodore on November 1-3, and the programme included the presentation and exchange of research information as developed by member foundries, and the study of service records of wartime applications of Meehanite castings in India, Australia, Africa, Great Britain and South America, where similar Institutes are in existence.

The following officers were elected:—*President*, Mr. Oliver Smalley, O.B.E., Meehanite Metal Corporation, New Rochelle, N.Y.: *Vice-Presidents*, Mr. H. B. Hanley, American Laundry Machinery Company, Rochester, N.Y., and Mr. A. C. Denison, Fulton Foundry & Machine Company, Cleveland, Ohio: *Secretary-Treasurer, Mr. C. S. Nichols*, Meehanite Metal Corporation, Chattanooga, Tennessee.

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**The Bakelite Corporation,** of 300, Madison Avenue, New York, 17, have published a 24-page booklet "Bakelite Resin Baking Coatings," which details the types of surfaces that can be coated.

# THE INSTITUTE OF VITREOUS ENAMELLERS

## ANNUAL MEETING IN MANCHESTER

The tenth annual general meeting of the Institute of Vitreous Enamellers was held at the Midland Hotel, Manchester, on November 25, Mr. W. Todd, Chairman of the Institute, presiding over a large attendance of members.

The minutes of the previous annual meeting were read by the Hon. Secretary and approved as a correct record.

### Statement of Accounts

The HON. TREASURER (Mr. W. S. Grainger) read details of the statement of accounts and of his annual report. The actual cash position was that there was a publication reserve of £150, a research reserve of £335, as well as a few pounds in the bank. There were approximately 200 members of the Institute.

The statement of accounts and the treasurer's report were unanimously approved and adopted.

### The Chairman's Report

The CHAIRMAN (Mr. W. Todd), in presenting his report, said: The year under review has been a memorable one, not because of any outstanding technical achievement, but by virtue of the reconstruction of the Institute's organisation for dealing with technical development and investigational work. Your Council has already expressed its personal indebtedness to Mr. John Gardom and his associates of the Development Committee for their work in compiling the report on the "Future Work and Policy of the Institute." When you have had an opportunity of perusing this work, you will, I am confident, re-echo their sentiments.

In January this year, the resignation of Dr. G. T. O. Martin, our Research Officer and Hon. Secretary, led to the cancellation of the agreement between the B.C.I.R.A. and ourselves, and was effective as from January 31, 1944. This also involved the dissolution of the Joint Committee, appointed for liaison purposes. The Council gave earnest consideration to the situation and resolved, in view of the attendant circumstances, to effect immediately one major change, *viz.*, to divorce secretarial duties from technical and research investigational work. The experiment of combining the two functions is one that the Council will not, I feel, desire to repeat. At the February meeting they set up a Development Committee, under the competent guidance of our vice-president, Mr. J. W. Gardom.

Their most important recommendation was to set up a Standing Technical Committee, whose function would be to consider and decide subjects for investigational work and to appoint sub-committees to carry out this work, reporting to the S.T.C. The Council's unanimous endorsement rewarded Mr. Gardom by appointing him convenor of the new S.T.C., with Mr. Aston, Mr. Biddulph, Mr. Hallsworth, Mr. Stone and Mr. Thomas to assist him. Since their formation they have revised and set up the following sub-committees:

#### Standards of Enamel Resistance

*Convenor,* Mr. W. S. Grainger; *Members,* Mr. Abbott, Mr. Biddulph, Mr. Clarke, Mr. Fry, Mr. Hallsworth, Mr. Stone and Mr. Thomas.

#### Enamel Colour Standards

*Convenor,* Mr. J. T. Gray; *Members,* Mr. Dunkley, Mr. Carter, Mr. Jackson, Mr. Stone, Mr. Vickery and Mr. Thomas.

#### Enamel Cast-iron Baths Standards

*Convenor,* Mr. W. H. Whittle; *Members,* Mr. Biddulph, Mr. Fuge, Mr. Laithwaite and Mr. Corfield.

#### Library and Whittle Foundation

*Convenor,* Mr. A. McLeod; *Members,* Mr. Abbott, Mr. Aston, Mr. Thomason and Mr. Thomas.

*British Standards Institution Representatives:* Mr. Thomas, Mr. S. Hallsworth and Mr. C. P. Stone.

Incidentally, the B.S.I. have accepted the Institute's method of testing for acid resistance, with particular application to metal sinks and metal draining boards.

### New Procedure

*The Development Committee further recommended:* (1) That the mode of election of members to Council be revised. A Committee was set up and the result of their deliberations is to be seen in the ballot forms now in your possession. (2) That fixed quarterly meetings of the Council shall be held in different centres, each of these meetings to be followed immediately by a full meeting of the Institute. These will probably be as follow:—February, Stoke-on-Trent; May (Whitsun), Edinburgh; August, Birmingham or Manchester; and November, London to coincide with the annual general meeting.

The mention of library service reminds the Council that they tendered on your behalf cordial thanks to Mr. Barrington Hooper for his handsome donation of £50 towards the inception of a library. We are sure the members will look forward to receiving the Committee's report at an early date with extreme interest.

### Standards

From time to time there are many expressed desires for standards for vitreous enamel and enamelled ware. One of the last recommendations of the Joint Committee on Vitreous Enamel was:—That purely technical matters, such as enamel properties, tests and specifications of types of enamel should be dealt with

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by the Institute; whilst questions of design should be considered by a conference of all interested trade organisations, and further suggested this very necessary meeting should be convened by the Vitreous Enamellers' Association. It is a matter of profound regret that such a conference did not materialise.

### Industrial Matters

In my report to you last year I said the Council would do all that lay within its powers to further the part that the enamel industry would play in the industrial rehabilitation. They had an opportunity when Mr. C. P. Stone drew their attention to the situation in regard to inadequate stocks of raw materials in this country—the difficulties that would arise in ensuring a vast increase in import, obviously necessary in order to cope with the demand for domestic appliances and utensils, consequent upon the Ministry of Works' immediate and post-war housing schemes. A deputation waited upon the Ministry of Supply authorities in London, when all aspects of the position were discussed. As a result, a meeting of representatives of the enamelling industry was convened by your Council and held in Birmingham on November 1. The Ministry had requested the Institute to obtain the following information:—

(1) The estimated total requirements of raw materials based on 1939 consumption.

(2) Estimated requirements of raw materials per 1,000 units of domestic appliances.

A Committee representing hollowware, refrigerators, general enamelling and signs, and electrical and gas appliances, was formed to watch the trade interests. The desired information was sent to the Ministry, and we shall follow up and see that action is effected.

Collaboration with the Corrosion Committee of the Iron and Steel Institute continues. Members will be interested to learn that in the latest interim report the submission is made that:—"Present tests and others have demonstrated that vitreous enamel is the only coating of a wide number included in the anti-glare investigations as a whole that will protect steel adequately for any length of time under these severely corrosive conditions (exposure in close proximity to coke ovens). The question then arises as to whether vitreous enamelling would be an economic solution of the problem. This may be considered as follows:—

(1) In 1942, the estimated cost of coating steel sheets with two coats of vitreous enamel was 9d. per sq. ft. for both sides of the sheet. At that time the price of plain black sheets was approximately £23 per ton, or, say, 6.5d. per sq. ft. for 16G sheet and 4.8d. per sq. ft. for 18G sheet. It is clear from the results of practical experience, described in Section 2, that the vitreous-enamelled sheets which would cost 4.8d. (basic 18G sheet), plus 9d. (enamelling cost), or 13.8 per sq. ft., would outlast two plain 16G sheets at 6.5d. per sq. ft. each, or 13.0d. in all. Consequently, as regards cost of materials, there would probably be little in it, but, when the heavy labour costs of stripping and erecting sheets are also taken into consideration, the advantage would undoubtedly lie with the vitreous-enamelled sheets. There are, however, several debit items to be entered against vitreous enamelled sheets, *viz.*: (i) The need for greater care in handling at all stages, *e.g.*, it might be desirable to crate them for transport by rail, which would add indirectly to their cost. (ii) The necessity for all fixing and other holes to be drilled before enamelling, which would involve a certain standardisation of roof design.

(2) To sum up, it may be said that, apart from the immediate and temporary problem of anti-glare sheeting, vitreous enamel should prove a serviceable and practical protective coating for steel exposed to corrosive atmospheres at high temperatures, and more extensive use may be made of it for such purposes in the post-war period. Such developments would be facilitated by investigations probably most properly conducted by the vitreous enamellers themselves, designed to minimise the practical difficulties outlined above that arise from the brittleness of the material. It should be added that this small-scale investigation does not point to any marked difference in the behaviour of the soft and hard ground coats, respectively The establishment of the most suitable enamel formulation for use on steel would no doubt involve considerable research, but it is already clear that it would be undesirable to use either type of ground coat without a finishing coat of acid-resisting glaze.

### Research

In March this year we endeavoured to bring home to the enamelling industry the desirability of extending the functions of the Institute by the formation of a Research Association of Vitreous Enamellers, but, unfortunately, our efforts proved abortive. Your Development Committee has given further consideration to this vital problem, and resolved to recommend to Council:—That the Institute should press forward in every possible way with research, and warmest support should be given to the proposal to impose a compulsory levy on the industry to provide funds for this purpose.

The Council desire to place on record their appreciation of the sterling work carried out by the Hon. Secretary, Mr. W. Thomas, during a year that has presented more difficulties, and involved greater strain upon the Secretary than any year in the history of the Institute. The members' thanks are also due to all members of Council and others who have given so freely of their limited leisure time in the interests of the Institute's work.

### Election of President

The RETIRING PRESIDENT (Mr. W. H. Whittle) said he entirely agreed with what Mr. Todd had said respecting the good work carried out by the different members of the Council, Mr. Gardom, the Treasurer, and Mr. Thomas and his staff. The past 12 months had proved to be a very difficult period in which to carry on the business of the Institute, but, in the cir-

cumstances, they had done very well. His pleasant duty was to introduce the newly-elected President, Mr. John W. Gardom. As there had been only one nomination, he declared that Mr. Gardom had been duly elected to the Presidential office.

The Institute had been most fortunate in its election of that gentleman for the Presidency during the ensuing year. They all knew what he had been in the past. He had been connected with the Institute since its inception, and had taken a very active part as Chairman of the Technical and Development Committees. Mr. Gardom was a gentleman of outstanding ability, and his chief interests had been closely connected with the foundry trade. Therefore, in his new position, he would be able to see that vitreous enamellers got a better class of casting than the kind from which so many troubles had been experienced in the past.

Mr. Gardom was awarded the Oliver Stubbs Gold Medal in connection with foundry work, and this year he was awarded the British Foundry Medal. He was also President of the Institute of British Foundrymen, and now had become the President of the Institute of Vitreous Enamellers. On behalf of the Institute, he had pleasure in wishing Mr. Gardom a most successful period of office, and hoping that he would have the best of health and strength in order to carry out his Presidential duties.

The CHAIRMAN (Mr. W. Todd), in supporting the election of Mr. Gardom to the Presidential chair, said it must be an especial pleasure to that gentleman to be elected to the office in his own Lancashire home town. It would have been possible to have secured someone with a brilliant military, naval or air force record to take up the office, but, speaking with all respect to everyone, it was felt that there was a job of work to be done, and that what was really required was a business man with driving force and energy as well as being a technical man.

Mr. J. W. Gardom was then unanimously elected as President of the Institute.

### Presidential Address

The newly-elected PRESIDENT (Mr. J. W. Gardom) said: Mr. Whittle and Gentlemen,—It is, of course, my first and very pleasant duty to express to you my grateful thanks for the honour which you have conferred upon me, and this I do with a very real appreciation of the responsibilities which are attached to my office.

I do not know all the members of this Institute personally, and no doubt there are many who do not know of my qualifications for this office. We have, however, a number of things in common, the chief of these being your interest in vitreous enamelling and mine in the production of castings suitable for enamelling—yours and mine in supplying a well-finished product of high quality.

Perhaps the last word in the enamelling industry has been, and still is, "quality"—a product of high quality produced by men of quality—and I accept as a very great compliment your decision to elect me as your President this year.

Enamels were used in ancient times, but the application of enamel to iron not only marked an important technical step forward, but it can be considered as the starting point of the present industrial application of enamels. While the first recorded application of enamel to cast iron was about 150 years ago, it is only within the past 100 years that sheet steel has been enamelled commercially. The absence during this period of interchange of knowledge between the metallurgist, who was developing new methods of steel production, and the enameller has delayed progress.

Our Institute is comparatively young, but I feel that its birth and development during the past 11 years reflect the industry's appreciation of the need for the continuance, in the face of increased industrial development, of those very high standards which have ensured its success in times gone by. It is probably true to say that in the last decade or so greater industrial developments have taken place than in any comparable period in history, developments in our production methods and in the materials which are being continually placed at the service of engineers, architects and other consumers. Not least has been the improvement in surface finish, a matter with which, of course, we are particularly concerned.

This industrial progress has been made possible by long years of experiment and experience, and it is now largely through the efforts of our technicians that all this accumulated knowledge is being applied to industrial production. One of the many problems facing us to-day is the reduction of the time lag between the publication of the results of pure research and the application of that knowledge to industry, and it is a problem which can only be solved by the technologist, who must continually analyse the problems of industry and the results of research.

It is he who must act as liaison officer between scientific interests and commercial craft, to ensure that in the minimum time the maximum use is made of the contributions of each. The industrial technician, and we here to-day are all industrial technicians, is therefore a highly important member of the community, and it is the responsibility of a technical institute such as ours not only to ensure that the technicians in the enamelling industry have every facility for gaining and interchanging information, but that the importance of the contributions which they can make to the wellbeing of the industry as a whole is fully recognised.

### Two Problems

All the technical problems confronting any progressive industry may be summarised under two headings. The first, how can a continual improvement in the quality of our products be secured, and the second, how can our products be developed to satisfy the changing and expanding requirements of consumers? At this time when the enamelling industry can look forward to brighter conditions than it has been allowed to have during the past few years, I would particularly direct your attention to the second of these problems.

We are continually hearing of the astonishing developments in the production of some of the newer

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materials, for example, plastics, and those who see their expanding production heralding the doom of some of the materials which have been in use for many years often fail to recognise that economic production of many articles in plastics is entirely dependent upon the availability of other materials, for example, cast iron of very superior mechanical properties. Allied to this, and of equal importance, is the development of an improved surface finish. Is this an application for vitreous enamel? Similarly, the development in the aeroplane has been dependent upon the production of improved materials, and has introduced a very important market for many other materials, from which ancillary aeronautical equipment is constructed. In this and many other new developments increased life and efficiency is being obtained by the use of vitreous enamel. It is in such applications, where enamelled finish gives increased mechanical results, that I foresee a wide field of progress for our industry.

In these days of rapid progress we must therefore look twice at every production method and material which is devised. We must look once to determine how far that method or material is likely to compete with our own product, and we must look a second time to see how far our own product may be used to aid the progress of the newcomer to our market. The technician is particularly suited for this work. He has, by years of experience, gained the necessary knowledge of production details, and by years of study has acquired the necessary technical knowledge and, what is equally important, the ability to analyse and assess the value of data placed before him.

The main work of a technical institute such as ours is to afford an opportunity to technicians to meet for discussions on common difficulties. Essentially with any technical institute it is impossible to obtain more than you are prepared to give. The greater the keenness and interest brought by the individual member, the greater the success and value of the institute to the industry as a whole, but, more particularly, to those who have worked to make it a success.

I claim to be a really good member of a technical institute, and I hope you will claim the same, because upon this basis we shall get to know each other better, appreciating and discussing one another's problems and thereby obtaining the advantages in which each one of us may share.

### Election of Hon. Secretary

The PRESIDENT (Mr. Gardom) said that if he did nothing else during his term of office than to propose that Mr. W. Thomas be elected Secretary of the Institute, and to see the proposition carried, he would feel amply repaid for all the responsibility which his office placed upon his shoulders. Of late, they had heard much of the work done by Mr. Thomas. He had himself been able to observe it, and therefore he could warmly endorse all the remarks which had been so ably made by the Chairman concerning it.

Mr. Thomas began his secretarial duties in January of this year, following upon a Secretary who had been guiding them in one particular direction upon the instructions of the Council. Then the Council decided a new direction should be taken so that Mr. Thomas had not only to pick up all the arrangements which had obtained in the past, but had also to start upon a new sphere of operations. He had had a hard experience in doing so, and had probably put in much overtime in keeping abreast of the Institute's affairs. It would seem as though the time had now arrived to make the secretarial position a permanent one.

MR. A. MCLEOD seconded the motion, and Mr. Thomas was duly elected Hon. Secretary of the Institute.

MR. THOMAS wished to thank the President and the members of the Institute for the expression of their confidence in his ability efficiently to carry on the secretarial office. It would be his aim to do everything in his power to further the interests of the Institute. It was, however, no use pretending that the job of Hon. Sec. did not entail quite a considerable amount of work which had to be sandwiched in between his other activities, but knowing the value of the Institute to the industry as he did he felt himself amply recompensed for the amount of midnight oil he had already burnt on the job. He wished also to pay tribute to the valuable services of those who had assisted him in the past, and also to his two assistants, upon whose shoulders much of the arduous work of the Institute had fallen.

### Election of Council Members

The CHAIRMAN (Mr. W. Todd) declared the following-named gentlemen to have been elected members of the Council:—Mr. C. P. Stone, Mr. Nicholls, and Mr. Baines. The two former gentlemen were existing members of the Council, while the latter was an ex-member. The vote had been extremely close, which reflected the interest taken in the election.

Upon the motion of Mr. Hallsworth, seconded by Mr. A. Biddulph, Wenham Bros. were reappointed auditors.

### Vote of Thanks to Retiring President

MR. W. S. GRAINGER had great pleasure in proposing that a very hearty vote of thanks be accorded to the retiring President (Mr. Whittle) for his services during the previous year. The Institute and the enamelling trade generally owed a great debt of gratitude to Mr. Whittle, who was one of two old stalwarts who had done so much for them. The other gentleman was Mr. Stewart, of the Chromographic Company, who, he was pleased to notice, had sent his son to attend the meeting.

Mr. Whittle was one of the prime movers in the formation of the Institute of Vitreous Enamellers, and his was the first signature on the Articles of Association. He was the first Chairman of Council, and had continued to hold that office for a number of years, until eventually it was considered fitting to reward such enthusiasm and interest by electing him to sit in the

(*Continued on page* 284, *column* 2.)

# THE MECHANISED PRODUCTION OF ALUMINIUM GRAVITY DIE-CASTINGS FOR THE MERLIN ENGINE

*Advantages of Gravity Die-Casting Oven Sand Castings*

By JOHN VICKERS

(*Continued from page* 244.)

**Chalk Test**

To prepare for this inspection, the castings are loaded in galvanised wire baskets constructed from ½ in. square mesh 12 g. wire, woven round 24-in. by 18-in. by 12-in. frames of ⅜ in. dia. mild-steel bar, and in these they are immersed in the oil tank. The hoisting and lowering of the baskets is executed by means of a 10-cwt. capacity electric pulley block, which has a speed of 30 ft. per min. and is controlled by a "push-button" box pendant at the end of a length of flexible cable. The block runs by push travel on a 7-in. by 4-in. R.S.J. runway erected above.

FIG. 39.—CHALK TEST. BASKETS OF CASTINGS BEING IMMERSED IN OIL TANKS.

Fig. 39 shows the baskets loaded with castings being lowered into the oil tanks.

These galvanised steel tanks are 7 ft. 6 in. long by 3 ft. 6 in. broad by 1 ft. 10½ in. deep, and are raised from the floor to a comfortable working level by means of a steel pedestal 1 ft. high. The contents, normally 150 galls., are a mixture of a light mineral oil and a cutting oil, in the ratio of 15 to 1, the minimum closed flash point of which is at 300 deg. F. and the maximum pour point at 38 deg. F., the specific gravity being between 0.900 and 0.920.

The oil is heated to a temperature of 185 to 195 deg. F. by means of high pressure processed water circulated through pipes running round the bottom of the tank—the approximate viscosity of the oil at this temperature being 35 to 40 secs. It is in oil under these conditions that the castings are allowed to remain for a period of between 15 to 20 min., depending upon the size of the particular casting.

After this period of soaking in this oil the baskets are raised from the tank and conveyed along the runway to the draining tray alongside, on to which the castings are emptied. When the majority of the oil has drained away, the castings are then transferred by hand into a tray containing timber sawdust, where they are dried of the remaining oil. Special care must

FIG. 40.—CHALK TEST. CASTINGS BEING DRIED AND DUSTED WITH CHALK.

be taken at this stage as it is imperative that before they are passed from this tray every casting must be perfectly dry.

The last stage in this preparation for inspection is the dusting of the dried castings with french chalk contained in a metal tray alongside. This drying and dusting treatment is illustrated in Fig. 40. The castings can now be transferred along the conveyor to the inspector, where they receive a most rigorous scrutiny.

During the soaking period in the tank, the temperature of the oil causes the castings to expand slightly, and any flaws, such as cracks, surface blowholes or porosity which may be present, would automatically expand and the oil permeate into the now

slightly enlarged orifices. Although all the castings are later thoroughly dried there still remains in these pores a certain amount of oil, and it is during cooling in the chalk tray when the casting contracts that the oil exudes from the flaws and upon contact with the french chalk causes slight decoloration.

It is this sign for which the inspectors look (Fig. 41), and all castings bearing this discoloration are laid aside for the verification of the chargehand before being finally rejected.

Fluorescent lighting is installed over the inspection benches, as experience has shown many advantages are obtained over ordinary tungsten lamps, the main parts being the absence of shadows, glare and blank spots, plus the advantage of providing an equal distribution of light over the required area. The installation of this type of lighting has resulted in the revelation of minute flaws which under normal lighting conditions may not have been disclosed at this stage, and

FIG. 41.—GENERAL VIEW OF CHALK INSPECTION DEPARTMENT.

would have been instrumental in causing labour to be expended on definite scrap.

Should a particular casting show consistently signs of the presence of such flaws a report is instantly made to the chief inspector so that a thorough investigation can be made in the casting section and the foreman acquainted for special attention to be immediately devoted to the casting to ensure that that particular fault is corrected with the minimum of delay.

The majority of the total scrap in the die-casting foundry is rejected at either visual inspection or at chalk test, so that the absolute minimum of labour is lost by discontinuing further operations on castings which are not to standard requirements. Castings passed as satisfactory at this stage are now released to have completed the final fettling operations which are necessary to remove the certain amount of excess metal, particularly in the form of flash, still remaining after the runners and risers have been removed by saw. Whether these operations are executed by machine or by hand or even by both is fully dependent upon the individual peculiarities of each casting, *e.g.*, shape, contour, etc.

Fig. 42 illustrates the removal of this flash from

FIG. 42.—TRIMMING OF "UNDERCARRIAGE PUMP DRIVE COVERS" BY "RINDIS" RING AND DISC FILING MACHINES.

one type of casting which lends itself to having this operation carried out by machine. On this machine, a "Rindis" Type 38-C, ring and disc filing machine manufactured by Lorant & Company, Limited, the particular casting shown is held firmly on the table and slowly rotated so that the profile is machine-filed by the file-faced disc revolving within a speed range of 85 to 560 r.p.m. By this same machine other types of castings may be dressed by means of the file-out revolving ring.

Fig. 43 shows this profiling operation being carried out on another type of machine, *viz.*, a "Wadkin's" Model "LU" electric high-speed router, having a speed of 24,000 r.p.m. The castings are clamped to a wooden jig which has on the underside a mild-steel former plate, and a guide pin, projecting from the centre of the table in alignment with the cutter, acts

as a centre around which the jig is worked following the contour of the former plate, while a similar profile is being milled on the casting on top of the jig. By this means, not only is the flash removed from the part, but the casting is actually being simultaneously machined to fine limits of accuracy.

At the right hand of the picture is the underside view of a duplicate of the jig in operation, revealing the lines of the former plate.

Other castings are more suitably handled in this operation on a Duplex high-speed double-ended grinder, as is shown in Fig. 44. The grinding wheels are 24-in. by 2½-in. by 8-in. bore and run at a peripheral speed of 9,000 ft. per min. A device is fitted to this machine so that, as the diameter of the wheel is reduced due to wear, the work rest can be advanced only a certain distance towards the wheel, and the speed must then be increased. This adjustment brings the peripheral velocity back to the original one, together with allowing the rest, once more, to be brought close to the face of the wheel. This operation must be repeated after the wheel has worn for

FIG. 43.—"WADKIN'S ROUTER" MILLING MACHINE PROFILING "OPERATING CYLINDER COVERS."

another predetermined distance; thus the periphery of the wheel is again speeded up to its original velocity of 9,000 ft. per min. A self-contained dust-collecting unit is fitted to this machine to trap all grinding dust, and so helps to improve hygienic conditions.

Where small sections of flash are required to be removed from a flat joint-face, an ideal machine for this linishing operation is one as illustrated in Fig. 45—a "Wadkin's" double-disc grinder. The casting is held on its edge on the table and the surface pressed firmly against the emery disc, which is revolving at a speed of 1,440 r.p.m. The exhaust ducting, which can be seen leading from the machine, carries the grinding dust to a self-contained dust-collecting unit, which is fitted to this machine also.

Pneumatic chipping hammers are used for removing, from some parts, surplus metal which may be of a heavier section and located at awkwardly placed points of the castings. The type found to be most satisfactory for female operators is a "Cleveland" type OW, fitted with hexagon tool noses and operated at 80-lb. pressure, giving 2,000 strokes per minute. Fig. 46 illustrates the surplus metal being removed from "rocker cover" castings by female fettlers operating this type of hammer.

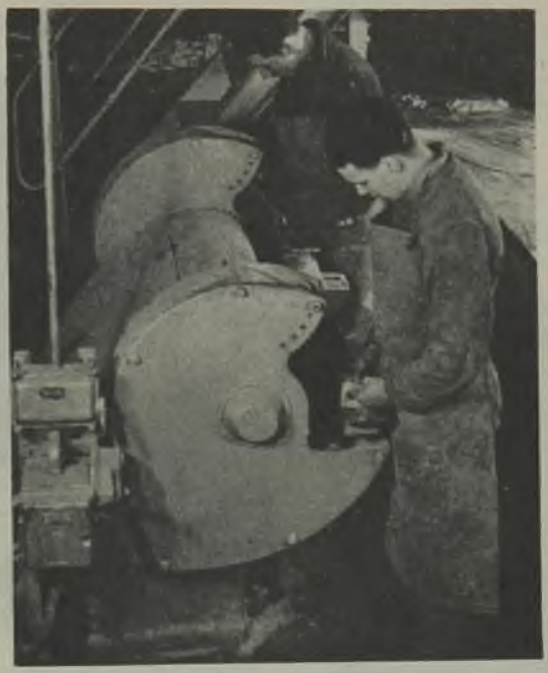

FIG. 44.—CASTINGS BEING TRIMMED ON "LUKE AND SPENCER" DUPLEX "DOUBLE-ENDED" GRINDING MACHINE.

Remaining pieces of flash are trimmed off by hand file, the casting being held by a vice fixed to a fettler's bench. This process is aptly illustrated in Fig. 47.

All fettling operations having been completed, the castings travel along to the final stages of inspection, *viz.*, pressure test and dimensional inspection.

### Pressure Test

Certain castings, mainly components of the coolant and fuel systems on the engine, are required to be tested under air pressure for porosity and blowholes. To execute this test, it is necessary to seal with rubber all open faces and cored bores of the casting, and this is done by means of jigs of simple design, the majority of which are fitted with quick-action cam handles (Fig. 48). The simple movement of these handles

## Aluminium Gravity Die-Castings

cause the rubber seals to be compressed against the open faces, thereby resulting in an airtight chamber being formed within the casting. Where the adoption of this type of handle is not practicable, the sealing of the casting is done in the same manner by pressing the seals by means of screw clamps, but the time saved by making use of the quick-action clamping jig is such that the use of the screw type is discouraged as much as possible.

Schrader couplings are fitted to the air line, the male portion being a fixture of the jig and the female portion at the end of a piece of rubber hose leading from the air pipe. The coupling of this connection automatically causes the internal chamber of the casting to be filled with compressed air, the required pressure being set by means of a valve fitted to the main air pipe.

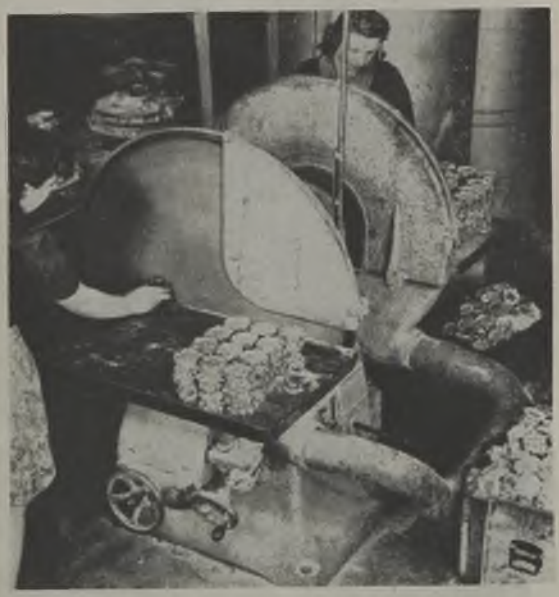

FIG. 45.—"CYLINDER BLOCK COVERS" BEING TRIMMED ON "WADKIN'S" DOUBLE-DISC GRINDING MACHINE.

Under this pressure, ranging from 30 to 50 lbs. per sq. in., the casting is immersed in water heated by the same medium as described in the chalk test section, to a temperature of between 100 to 140 deg. F., and it is held under the surface for a period of 15 to 20 sec.; the actual pressure, temperature and period of immersion is governed by the size and construction of the particular casting under test.

Any flaws in the form of porosity or blowholes will allow the compressed air to pass through the wall of the casting, and thus cause bubbles to rise to the surface, this denoting to the inspector the exact location of the fault. In Fig. 49 an inspector can be seen holding a casting under water while searching for this sign.

### Stretching and Straightening

During production operations, certain castings are liable to become slightly distorted in handling. Fortunately, the number of parts so affected is very small —actually only five out of the 103 gravity die-castings on the engine. These five castings, *viz.*, rocker cover, gearcase, diffuser vane ring, housing control bracket and the wheelcase cover, all have the same feature—a length of fairly thin section which lends itself to this slight distortion.

Fig. 51 illustrates the straightening, by press, of a rocker cover which has been distorted in handling and the nature of the twist such that the casting could not be brought into alignment by the normal method of tapping gently with a wooden mallet.

On the surface table behind the press, an inspector can be seen examining a wheelcase cover in a fixture designed to test for alignment, and the construction of this jig is such that any distortion present in the casting can be removed by gently striking with a mallet until the face of the cover agrees with the location points of the fixture.

FIG. 46.—CHIPPING HAMMERS BEING USED TO FETTLE "ROCKER COVER" CASTINGS.

A similar fixture has been designed for all of the five parts mentioned above, and in Fig. 52 an inspector can be seen removing, by means of a mallet, distortion present in a rocker cover which is being held in a straightening and inspection jig. On leaving these jigs, the castings require then to be tested for metal thickness only, and this inspection is executed by the final dimensional inspection section.

### Final Dimensional Inspection

The average output of castings from this foundry totals approximately 100,000 per week, and their

dimensional accuracy is verified by the 13 female inspectors seen seated, in Fig. 53 below, at both sides of the conveyor.

It has been the policy of the management to train each of these girls to inspect certain jobs only, so that she may very early become efficient and even expert on her own particular group of parts. It will be noted upon viewing the above illustration that no blue prints are visible, the reason being that each girl knows the castings in her "group" and is thoroughly conversant with all relative dimensions. What standard of efficiency and accuracy these girls have attained can be judged from the fact that a machine shop rejection, for dimensional errors attributable to the foundry, of five castings in any one month would be considered to be excessive.

FIG. 47.—TRIMMING OF CASTINGS BY HAND FILE.

It will be seen from Fig. 54 that fluorescent lighting is installed in order to assist the inspectors by having the lighting distributed evenly over the section.

In Fig. 54 the girl in the foreground can be seen measuring the wall thickness of a "coolant pump cover" by means of a "figure-eight" type of caliper gauge. By holding the points at one end of the gauge against the thickness to be measured, a gap of similar size is made between the points of the other end, and this is measured by means of a taper gauge, which is graduated in 0.025 in. from 0.050 in. to 0.400 in.

All castings scrapped by these girls are reviewed by a male inspector before a definite rejection is made. The reason for this being that although a casting may not be 100 per cent. to drawing standard, the fault, as found by the girl, may not be sufficiently serious to warrant scrapping, and it is upon the skilled inspector, who is conversant with the set-up of the casting on the engine, that the final decision rests.

Each inspector in this section is equipped with a steel type of $\frac{1}{16}$ in. letters with which every casting "passed" by her is stamped, and, as each stamp comprises of different code letters, any casting discovered in the machine shops to be scrapped because of dimensional inaccuracy, can be traced to the inspectors who had allowed it to leave the foundry.

### Heat-treatment

The only remaining operation to be carried out on the castings is the ageing and solution treatment where required. After they have been stamped by the inspector certifying that they have been inspected and approved, the castings are placed in metal bins, commonly known to the operators as "heat-treatment baskets," which are constructed of 16 S.W.G. sheet iron perforated with $\frac{1}{8}$ in. dia. holes to allow the free circulation of the hot air around the castings, thus automatically ensuring uniform heating while in the heat-treatment furnace.

FIG. 48.—PRESSURE TEST—CLAMPING JIGS TO CASTING.

### Solution Treatment

Certain constituents of aluminium alloys, *e.g.*, copper aluminide, magnesium silicide, magnesium, are soluble in aluminium to a much greater extent at a temperature near to the melting point of the alloy than at normal atmospheric temperature. For the purpose

## *Aluminium Gravity Die-Castings*

of bringing into solution such constituents as these, the castings are heated in an "EFCO" forced air circulation furnace (Fig. 55).

FIG. 49.—PRESSURE TEST—"BOOST CONTROL" CASTING, IMMERSED IN WATER, BEING TESTED FOR POROSITY.

FIG. 50.—GENERAL VIEW OF WATER TEST DEPARTMENT.

FIG. 51.—STRAIGHTENING OF "ROCKER COVER" BY SCREW PRESS.

FIG. 52.—"ROCKER COVER" IN STRAIGHTENING AND INSPECTION JIG.

It is a vertical cylindrical furnace, and is designed so that, by means of a 30-in. dia. fan, of the Gill screw type with a speed of 1,440 r.p.m., in conjunction with a baffle fitted between the charge and the heating elements, the air is circulated rapidly and uniformly in a definite path over the heating elements, and through the charge in turn. The method of control of the hot air guarantees the variance of the temperature to be not more than $\pm$ 2½ deg. C., and irrespective of the density of the charge the maximum volume of air is always circulated.

Overall, the furnace is about 8 ft. dia. by 12 ft. deep, the dimensions of the heating chamber being 4 ft. 6 in. dia. by 9 ft. deep. The lid, which also carries the air circulating fan, is suspended from a structural steel traversing carriage, and the outer edge is extended downwards in the form of a skirt, so that when the furnace is closed, it forms an airtight seal with the trough provided round the top of the furnace casing.

To charge the furnace, the lid is lifted clear of the seal by means of a motor-operated mechanism, and, by hand, it is traversed to one side on cast-iron wheels travelling on flat-bottomed rails carried on a steel gantry running alongside about 3 ft. from the floor level.

FIG. 53.—GENERAL VIEW OF FINAL DIMENSIONAL INSPECTION DEPARTMENT.

FIG. 54.—FINAL DIMENSIONAL INSPECTION OF CASTINGS.

On the other side of the furnace, sunk in a pit approximately 9 ft. deep, is the cylindrical quenching tank, which is overall 12 ft. deep by 6 ft. diameter. Fitted within are the immersion heaters, which raise the temperature of the quenching medium to the predetermined level—the temperature at all times being thermostatically controlled. Contained in perforated heat-treatment baskets, which have already been described, the castings are loaded on the trays of a charge carrier, as illustrated in Fig. 55, and in this manner lowered into the heating chamber.

A predetermined temperature is fixed, being slightly lower than that at which the lowest melting point constituent of the alloy would fuse, and the castings are allowed to "soak" in the air which is being circulated, at this temperature, around the charge within the furnace. This "soaking" allows the diffusion of the constituents to take place, the immersion period being governed by the time taken to bring into solution practically all the constituents of the alloy.

FIG. 55.—CHARGE OF CASTINGS BEING LOWERED INTO SOLUTION TREATMENT FURNACE.

When this point has been reached, the charge is rapidly withdrawn from the furnace and plunged into the quenching tank—the time taken to transfer from one to the other must not under any circumstances exceed 20 secs. Water, heated to a temperature of 90 deg. C., is the medium used to quench the aluminium alloys at present in production, these being described in detail at a later stage. The object of this quenching treatment is to retain in solution throughout the mass the highest possible percentage of the constituents.

The alloy in this state, however, is not completely stable at normal atmospheric temperature as the constituents in excess tend to precipitate in a microscopic form, and if no further treatment was given to the castings the precipitation would take place normally over a period of days.

*(To be continued.)*

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**Bradley's Magazine,** the house organ of Bradley & Foster, Limited, Darlaston, Staffs, has made a welcome reappearance. This one is the September issue, but suffers nothing because of its lateness, as the technical information it contains is unlikely to "date." "Moulding a Large Acid-resisting (14 to 16 per cent. Silicon Iron) Reaction Vessel" and "Inoculated Cast Iron" are the two main articles, and these will be topical for many years to come.

## VITREOUS ENAMELLED CAST-IRON BATHS

The following specification has been drawn up at the request of the Ministry of Works by a special sub-committee of the Institute of Vitreous Enamellers:

*General.*—This specification refers to the enamelled surface of cast-iron baths, and is not concerned with the cast-iron body. The specification lays down the minimum standard to which a bath to be used for domestic purposes should conform, as received from the manufacturer.

*Finish.*—Gloss, visually good; opacity, visually good.

*Solubility.*—The enamel should withstand the attack of 2 per cent. solution of anhydrous sodium carbonate in distilled water for a period of 24 hrs., applied in a similar manner to the I.V.E. acid spot test.

**Defects**

A bath shall be rejected if it shows the following defects:—

(*a*) *Crazing.*—Not to be confused with mechanical scratching which will exhibit an irregular edge under a magnifying glass.

(*b*) *Chipping.*—Unless not exposed on installation.

(*c*) *Dimples, lumps, rundown, sagging, and specks.*—Unless not readily attracting attention when viewed from normal eye level under natural light.

(*d*) *Blisters.*—Only allowable if they cannot be broken by pressure of fingernail.

(*e*) *Pinholes.*—Unless not penetrating to metal.

**Constitution of the Sub-Committee**

The constitution of the sub-committee was as follows:—W. H. Whittle, chairman, President of the Institute; A. Biddulph, A. J. D. Black, Dr. T. H. Caulfield, C. A. Fuge, J. G. Keith, H. Laithwaite, W. E. Read, W. Thomason, W. Thomas, hon. secretary.

## NEW TRADE MARKS

*The following applications to register trade marks appear in the "Trade Marks Journal":—*

"CRESTALLOY"—Common metal alloys in sheet form. TRANSFORMER STEELS, LIMITED, 22, Old Broad Street, London, E.C.2.

"AUTACOKE"—Coke-burning fire grates and cooking and heating apparatus. TRIPLEX FOUNDRY, LIMITED, Locarno Road, Tipton, Staffs.

"ROAD-MARSHALL"—Road-making and agricultural machines. MARSHALL, SONS & COMPANY, LIMITED, Gainsborough, Lincs.

"CANNONZONE"—Solid fuel and gas cookers, water heaters, and boilers. CANNON IRON FOUNDRIES, LIMITED, Deepfields, Bilston, Staffs.

"MOTOSUDS"—Centrifugal pumps. S. M. STUART-TURNER & COMPANY (SURREY), LIMITED, Sentinel Works, Fairview Road, Norbury, London, S.W.16.

"METCO"—Apparatus for spraying molten metal, rotary shaft tools for roughening metal surfaces, air compressors, grinding machines, etc. METALLIZING ENGINEERING COMPANY, INC., c/o Marks & Clerk, 57-58, Lincoln's Inn Fields, London, W.C.2.

## THE INSTITUTE OF VITREOUS ENAMELLERS

(*Continued from page* 276.)

presidential chair. It was a distinction he amply merited, and he had filled that position with unqualified success.

It was very encouraging to learn that they could rely upon a continuance of his valuable guidance in the future, because he would not be the first life member of the Council.

MR. ASTON seconded the vote of thanks, saying that when Mr. Whittle became the first Chairman of the Council no one else wanted the job, and if he had been a different type of man from what he was there might have been very great difficulty in filling the position. He had kept them from doing foolish things, and by his tact and kindly nature had caused the business of the Institute to run smoothly.

MR. W. H. WHITTLE, in responding, said that, after all, there was something more to be gained in life than could be got by merely chasing business, because in all walks of life the human element must be taken into account. Everyone might rest assured that anything he could do to promote the best interests of the Institute or its members would be most willingly done.

The business of the annual general meeting was then concluded.

## ENAMELLING INDUSTRY AND POST-WAR PROBLEMS

(*Continued from facing page.*)

Institute Committee who were dealing with the matter had had very wide experience and contacts, so the figures had amply taken care of the electrical industry. However, the Institute would be pleased to receive any figures that the B.E.A.M.A. put forward.

After some further discussion, MR. W. S. GRAINGER proposed the following motion:—"That this meeting is in full agreement that joint action be taken in providing the appropriate authority with the necessary data, enabling the raw materials to be made available for the permitted post-war programme."

This motion was seconded by MR. J. NICHOLLS, and carried unanimously.

MR. GRAINGER then moved that the Committee already formed by the Council of the Institute be augmented by co-option of a member from the following sections of the industry:—(1) Hollow-ware, Mr. G. H. Eveson; (2) refrigerators, Mr. W. Gellman; (3) general enamelling and signs, Mr. W. H. Whittle; and (4) electrical, a nominee of the B.E.A.M.A.

This motion was seconded by MR. H. F. POTTER, and, after discussion, was carried unanimously.

**Umgeni Iron Works (Pty.), Limited,** Durban, have supplied a number of high-silicon castings, which are being used to replace glass in the extraction of citric acid. These castings have been in service during the past few months and appear to give satisfactory results.

# ENAMELLING INDUSTRY AND POST-WAR PROBLEMS

A meeting of representatives of the enamelling industry was held at the Grand Hotel, Birmingham, last month. It was called by the Council of the Institute of Vitreous Enamellers. Those present included Mr. W. Todd (chairman), Mr. H. H. Aston, Mr. J. W. Gardom, Mr. W. S. Grainger, Mr. S. Hallsworth, Mr. J. Nicholls, Mr. C. P. Stone, and Mr. W. Thomas, representing the Institute.

The Non-Ferrous Metals Control, Ministry of Supply, was represented by Mr. W. R. Lewis; the B.B.M.A., by Mr. J. G. Keith; the B.E.A.M.A., by Mr. J. M. Sunrall; the British Iron Founders' Association by Mr. H. Laithwaite; the International Tin Research and Development Council, by Mr. W. R. Lewis; the Sheet Steel Makers' Conference, by Mr. H. N. Breeze and Mr. L. C. Salter; the Society of British Gas Industries, by Mr. H. F. Potter; the Vitreous Enamellers' Association and the Wrought Hollow-ware Trade Employers' Association, by Mr. G. H. Eveson; Borax & Chemicals, Limited, by Mr. A. Rodway; Borax Consolidated, Limited, by Mr. A. J. Somers; Ferro Enamels, Limited, by Mr. H. Tonkinson; I.C.I. Alkali, Limited, by Mr. N. L. Evans; I.C.I., Limited, by Mr. H. R. Feeny; Stewart & Gray, Limited, by Mr. W. F. Parker; C. J. Baines & Company, Limited, by Mr. C. J. Baines; Union Oxide & Chemical Company, Limited, by Mr. W. Astles; Electrolux, Limited, by Mr. W. Gellman; John Summers & Sons, by Mr. G. E. Tregoning; C. E. Ramsden & Company, Limited, by Mr. A. Bobb; E.I.S.P. Company, Limited, by Mr. J. H. Price.

The CHAIRMAN opened the meeting by explaining that certain members of the industry were concerned about the lack of raw materials at present held in this country, in view of the probable rapid increase of production by the enamelling industry, to cope with the Ministry of Works' post-war housing problem. Those members had interviewed the Ministry of Supply concerning certain specific materials, and arising therefrom the Ministry had realised the very important implications and had asked for a deputation from the Institute to meet them.

### Ministry's Programme for 1945

This meeting duly took place, when the Ministry put forward their tentative programme for the year 1945, which was that 90,000 temporary houses be built, 30,000 permanent houses and 80,000 houses in course of erection. Also, replacements for bomb-damaged houses covering the whole country to the extent of 500,000 houses.

The Ministry had requested the Institute to obtain for them the following information:—(1) The estimated total requirements of raw materials based on the 1939 consumption, and (2) estimated requirements of raw materials per 1,000 units of domestic appliances.

The chairman explained that, while it was not the function of a technical institute such as the I.V.E. to undertake such an investigation, which was more a matter for the various trade associations, the I.V.E. were anxious to assist the industry in every manner. As no one association covered the whole industry, and the I.V.E. had contact throughout, it was felt that in this instance the Institute should undertake the calling of this meeting of the trade.

Referring to the two questions asked by the Ministry, the figures for the total requirements of raw materials could be obtained in two ways, namely, from figures submitted by the various enamel suppliers and users through their trade associations, and also by estimates made from the quantities of borax, or other key raw materials used in the industry during the basic period. However, as the Ministry wanted these figures urgently, and they had been promised by November 8, it was felt that perhaps the latter method would be the more desirable. With regard to the second question, these figures could only be obtained from the manufacturers of the various appliances, and it was hoped that those attending the meeting would supply these.

The meeting was then thrown open for discussion.

MR. A. J. SOMERS, speaking on behalf of the borax suppliers, intimated that they would be willing to supply the figures necessary to satisfy the first requirement, but pointed out that a difficulty arose from the fact that certain manufacturers of frits also manufactured glazes for the pottery industry, and that the borax-supplying companies had no means of separating what was used for frit, and what was used for pottery glazes. He undertook, however, to endeavour to obtain from the few firms doing this, figures which would allow a close approximation to be made of the borax used in the enamelling industry. MR. A. RODWAY intimated his agreement with the above.

MR. G. H. EVESON, representing the Wrought Hollow-ware Trade Employers' Association, explained that it was not possible to give figures per 1,000 units for hollow-ware production, owing to the multiplicity of production, but that he would be prepared to give figures of raw materials required per ton of hollow-ware manufactured. The CHAIRMAN considered that this would be the best method of submitting the figures for this particular section of the industry.

The CHAIRMAN quoted figures for the gas-cooker industry, with which, as the meeting knew, he was intimately connected, and MR. H. F. POTTER, representing the Society of British Gas Industries, asked whether gas water heaters had been taken care of. It was explained that no figures had been obtained for this particular item, and Mr. Potter undertook to forward these to the hon. secretary.

MR. W. GELLMAN, representing Electrolux, Limited, agreed, subject to his company's approval, to supply figures for refrigerators.

MR. J. M. SUNRALL, representing the B.E.A.M.A., said that he could not accept the figures submitted by the gas industry would hold for the electric industry, but the chairman pointed out that members of the

(*Continued on facing page, column* 2.)

# BRITAIN'S WAR EFFORT

## MOBILISATION OF MEN AND MATERIALS

Between June, 1939, and June, 1944, the total number of men aged 14 to 64 and of women aged 14 to 59 in the Services or in industrial employment in Great Britain rose by 3½ millions—from 18½ to 22 millions—an increase of nearly one-fifth. This increase was achieved by (*a*) reducing the number of unemployed by 1¼ millions, and (*b*) a net addition to the labour force of the country of 2¼ million persons not previously in industrial employment. In these figures, two women working part-time have been counted as equivalent to one whole-time worker. If the comparison between 1939 and 1944 had been made counting each woman working part-time as equal to one whole-time worker, and the comparison had covered men and women of all ages, the increase in the number in the Services or in industrial employment since 1939 would have been 4½ millions.

These figures, and others which follow, are given in a White Paper, "Statistics Relating to the War Effort of the United Kingdom," issued by the Government last week.

Of the total of 22 millions at the middle of 1944, 47 per cent., or 10.3 millions, were in the Services or whole-time Civil Defence or employed in engineering, shipbuilding, metals and chemicals—industries mainly concerned in the output of munitions.

The scale of mobilisation of man-power achieved has been far greater than was attained in the last war. The number of men and women in the Services or in industrial employment reached its highest level towards the end of 1943, by which time labour was fully mobilised.

It is estimated that the monthly output of munitions in the United Kingdom in the first half of 1944 was about six times as great as at the outbreak of war. This increase relates to the over-all rate of production of naval and merchant vessels, aircraft, ground munitions and other munitions and warlike stores.

### Iron and Steel

One of the important problems facing the Government during the war has been to meet the demand of the munitions and other industries for essential raw materials and, at the same time, to economise in the use of imported raw materials and semi-finished products. This has been particularly important in the case of the iron and steel industry, which had previously relied on large imports of iron ore. To this end the home output of iron ore has been increased by more than one-half since before the war. In spite of the fact that this has meant using low-grade home ore instead of high-grade imported ore, the output of pig-iron has been maintained at a high level. The total steel production has been consistently above the pre-war average (notwithstanding the need to increase greatly the proportion of alloy and high-grade steels produced), so limiting the increase in imports which the activity of the munitions industries would otherwise have made necessary. Another substantial contribution to the domestic supply of steel has been made by a severe curtailment of our exports of steel products. The collection of iron and steel scrap for steelmaking is one-third larger than before the war.

Some of the most outstanding increases in production have been made by the light metals industry to meet the requirements of aircraft and incendiary bomb production. Magnesium production is more than eleven times the pre-war rate—an achievement which has meant the creation of virtually a new industry.

Home production of iron ore, pig-iron and steel is shown below:—

Iron ore (average ferrous content about 30 per cent.).—1935-38 average, 12,417,000 tons; 1939, 14,486,000; 1940, 17,702,000; 1941, 18,974,000; 1942, 19,540,000; 1943, 18,487,000 tons.

Pig-iron.—1935-38, 7,350,000 tons; 1939, 7,980,000; 1940, 8,205,000; 1941, 7,392,000; 1942, 7,604,000; 1943, 7,187,000 tons.

Scrap for steelmaking.—1935-38, 5,800,000 tons; 1939, 6,379,000; 1940, 6,527,000; 1941, 6,622,000; 1942, 7,688,000; 1943, 7,782,000 tons.

Steel ingots and castings.—1935-38, 11,256,000 tons; 1939, 13,221,000; 1940, 12,975,000; 1941, 12,312,000; 1942, 12,764,000; 1943, 13,031,000 tons.

Imports of steel and steel-making materials as a whole were maintained in the first two years of the war to meet the expanding requirements of the munitions industries, but by 1943 they had been cut to about 3 million tons below their pre-war level. The greatest economy in shipping was obtained by reducing imports of iron ore and scrap, while importing more finished and semi-finished steel.

# DISPOSAL OF SURPLUS STORES

The House of Commons Select Committee on National Expenditure has issued a preliminary report on the departmental organisation now being set up for the disposal after the war of Government surplus stores. Whether or not the scheme devised requires modification can only be seen when it has started to work. The Committee considers that it should be put to the test by immediate application to the disposal of current surpluses.

The report emphasises the desirability of the disposal of metal scrap "in circumstances which indicate no undue preference for certain firms." With regard to battlefield scrap, the report says that in North Africa arrangements were made to divide such scrap between the Allies on a zoning basis. It is understood that no such arrangements have yet been made in the European theatre of war. The Committee recommends that steps be taken as soon as possible to reach agreements on the division of the large quantities of battlefield scrap arising in Europe.

The Committee considers it urgent from the point of view of ultimate economy and restoration of trade that the departmental machinery for the disposal of surplus raw materials, etc., should be settled and a co-ordinated scheme presented to the House.

## PERSONAL

MR. W. H. CRUDGINGTON, works engineer with Dorman, Long & Company, Limited, has retired after 32 years with the company.

MR. A. G. CLARK has been appointed chairman of the Plessey Company, Limited, in the place of the late Mr. Henry Morgan. MR. J. A. SMITH has been elected to the board and will continue to act as secretary.

MR. M. L. JAMIESON, J.P., who has been appointed by the Minister of Labour and National Service as chairman of the Glasgow South Side Advisory Committee for Juvenile Employment, is a director and production manager of G. & J. Weir, Limited, engineers, Cathcart. He has already taken a leading part in youth training as chairman of the Joint Technical Training Advisory Committee for the Engineering Trades.

MR. D. A. OLIVER, research director of William Jessop & Sons, Ltd., and J. J. Saville & Company, Limited, Sheffield, while continuing in this position, has also been appointed director of research to the Birmingham Small Arms group, of which Jessops and Savilles form part. The B.S.A. group research activities, in addition to being carried on in the existing laboratories situated at the different works of the group, notably the Daimler Company, Limited, Coventry, the B.S.A. Company, Limited, Small Heath, Birmingham, and B.S.A. Tools, Limited, Birmingham, are to be considerably expanded. New facilities and equipment are being provided. Some recent additions to the research staff include DR. A. J. BRADLEY, F.R.S., late of the Cavendish Laboratory, Cambridge, and past holder of the Warren Research Fellowship of the Royal Society in X-ray crystallography, and MR. P. H. LAWRENCE, late of the Ministry of Aircraft Production, London. MR. H. W. PINDER, who has been for several years responsible for metallurgical research under Mr. Oliver, becomes head of technical sales in the Jessop-Saville organisation.

## MORE NICKEL FOR CAST IRON

Owing to improvements in the supply position, the Non-Ferrous Metals Control have made it known that they are now prepared to authorise the use of nickel in iron castings for a greatly increased list of applications. This list covers castings for most engineering purposes, including the motor-vehicle, Diesel-engine, machine-tool, electrical and chemical industries and mining, steam-raising and power plant, whilst it also allows an increased use of nickel in iron castings for resistance to wear, corrosion and heat. It also permits the extended use of nickel in high-strength and high-duty iron castings generally.

THE GENERAL ELECTRIC COMPANY, LIMITED, is to create 2,000,000 4¼ per cent. "C" preference shares of £1 each. No public issue is contemplated. The proceeds will be applied to repay a loan granted to the company from outside sources.

## OBITUARY

MR. T. E. STARKEY, who was with the Turner Manufacturing Company, Limited, Wolverhampton, for 38 years, died recently. Starting with the firm as a workman, he became works manager, and during the last three years was general manager.

MR. JAMES GEDDIE, manager of the bridge department of Dorman, Long & Company, Limited, has died at Saltburn at the age of 75. Second son of the late Mr. John Geddie, of "The Scotsman," he was educated at Edinburgh, was mentioned in despatches for bridge replacement work at Salonika in the last war, and during his 20 years' service with Dorman, Long & Company helped to build the Tyne and Lambeth bridges.

COL. DAVID ROSS MACDONALD, formerly manager of Sir W. G. Armstrong Whitworth & Company, Limited, Walker; Wood Skinner & Company, Limited, shipbuilders, Bill Quay; and Palmers (Hebburn) Company, Limited, died recently, aged 80. He retired 10 years ago. Col. MacDonald served his apprenticeship with William Denny & Bros., Limited, Dumbarton. He was a vice-president of the North-East Coast Institution of Engineers and Shipbuilders.

DR. GEORGE STANLEY WALPOLE, who died recently at the age of 60, was the founder and chairman of the Walpole Group—an association of industrialists, politicians, trade union leaders, and professional men, created to focus opinion on matters of immediate or post-war importance. The discussions of this group had much to do with the demand for a Ministry of Production. Born in Australia, of English parents, G. S. Walpole took the degree of D.Sc. at Queen's College, Melbourne University, and came to London at the age of 23. Early in the 1914-18 war he was appointed to the technical directorate of the Air Inspection Department, subsequently transferring to the operational side of the R.N.A.S., with the rank of captain. On demobilisation he began practice as a technical consultant, but in 1920 he created his own precision-engineering business in South London. He was a Fellow of the Institute of Industrial Administration, honorary associate of the Institute of Labour Management, and a member of the Industrial Co-Partnership Association.

## HAROLD WRIGHT LECTURE

Dorman, Long & Company, Limited, have recognised the outstanding work of Mr. Harold Wright, their chief metallurgist, by endowing a triennial lecture to be given under the auspices of the Cleveland Scientific and Technical Institute. Known as the Harold Wright Lecture, it will be given by an eminent authority in metallurgical, chemical or kindred subjects in which Mr. Wright's interests have been centred. The first lecture will be delivered by Dr. C. H. Desch, F.R.S., in the Cleveland Scientific and Technical Institute, Middlesbrough, on December 13 next, at 7.15 p.m. His subject will be "The Past and Future of Steel."

## COMPANY RESULTS

*(Figures for previous year in brackets.)*

**J. Stone & Company**—Interim dividend of 10% (nil) on the ordinary shares.

**Masson Scott**—Dividend of 5% (dividend of 5% and a special bonus of 5%).

**Allied Ironfounders**—Interim dividend of 5%, less tax, at 9s. 10½d. (same).

**Birmid Industries**—Dividend of 10% (same) and a cash bonus of 10% (7½%) for the year ended October 31, 1944.

**Cornercroft**—Trading profit to June 18 last, after charging depreciation, £58,060 (£48,713); E.P.T. and income-tax, £45,000 (£35,500); ordinary dividend of 15% (same); forward, £3,845 (£3,838).

**Perry & Company**—Trading profit for the year ended July 31, 1944, £152,958; depreciation and taxation, etc., £135,779; net balance, £17,179 (£15,862); ordinary dividend of 10% (same); forward, £27,705 (£26,066).

**Sir Lindsay Parkinson & Company**—Net profit for 1943, after tax, £27,872 (£34,187); ordinary dividend of 10¼% (12½%), and extra dividend of 3% on the 5% cumulative participating preferred shares, making 8% (9⅜%).

**Brett's Stamping**—Net profit from July 18, 1943, to July 31 last, after depreciation, taxation, A.R.P., war damage insurance, etc., £15,249 (£15,297); ordinary dividend of 25% (same); taxation reserve, £7,000; forward, £12,136 (£11,987).

**Wellworthy Piston Rings**—Gross profit to July 31, £68,274 (£78,155); income-tax, £38,054 (£44,368); ordinary dividend of 15% (same); deferred repairs, £5,000 (£10,000); to general reserve, £5,000 (£10,000); forward, £18,945 (£16,125).

**Bell Bros. (Manchester 1927)**—Trading profit to March 31, £18,639 (£25,898); depreciation, £1,220 (£1,359); reserve for taxation, £9,000 (£15,000); net profit, £7,619 (£8,739); year's preference dividend to March 31, 1939 (same to 1938); forward, £8,249 (£8,130).

**Associated Equipment**—Trading profit, £1,154,304 (£1,291,594); interest, £10,589 (£7,308); depreciation, £150,000 (£100,000); deferred maintenance reserve, £25,000 (nil); general reserve, £20,000 (same); dividend for the year of 7½%, free of tax (same, plus a bonus of 5% free of tax).

**J. A. Crabtree & Company**—Trading profit for the year, £246,431; income-tax and E.P.T., £162,451; surplus, after writing off capital expenditure and allowing depreciation, £72,439; brought in, £79,435; tax-free dividends of £65,000 to Crabtree Electrical Industries, Limited; to reserve, £10,000; forward, £76,875.

**Thomas Blackburn & Sons**—Trading profit for the year to June 30, £41,800 (£42,855); net profit, after taxation, depreciation, etc., £12,623 (£11,566); preference dividend, less tax, £1,800; dividend on the ordinary shares of 8% (7½%); to freehold properties reserve, £1,500; to general reserve, £4,000; forward, £3,040 (£2,917).

**Stewarts and Lloyds of South Africa**—Profit to June 30, 1944, £193,500 (£200,636); over-provision of taxation, £10,817 (nil); profit on realisation of non-trading assets, £768 (nil); to contingencies reserve, £75,000 (same); debenture redemption reserve, £6,000 (£5,600); ordinary dividend of 20% (same); forward, £94,353 (£87,768).

**Drake & Gorham**—Trading profit, including part profit to date on work in progress and interest on investments, etc., £83,218 (£71,587); general charges, depreciation, etc., £45,460 (£43,284); taxation, £24,800 (£14,357); debenture interest, £1,785 (£1,928); net profit, £10,173 (£11,018); dividend of 5% (same), £6,250; forward, £21,585 (£17,662).

**Fairfield Shipbuilding & Engineering Company**—Net trading profit to June 30 last, after providing for taxation and depreciation, £95,975 (£95,949); interest on "A" mortgage debenture stock, £12,500; dividend on the 6% cumulative preference shares, £15,000; reserve for contingencies, £50,000 (same); dividend of 10% on the ordinary shares (same); forward, £58,132 (£52,157).

## VICKERS ANNOUNCE NEW APPOINTMENTS

Vickers, Limited, announce a number of changes in the directorate and management following the death of Commander Sir Charles Craven.

Mr. A. A. Jamieson, chairman of Vickers, has been granted temporary leave of absence by all other companies with which he is concerned, in order that he may devote the whole of his time and attention to his duties as chairman.

Sir Frederick Yapp has been appointed managing director of Vickers, and he will in addition be chairman of Vickers-Armstrongs, Limited. Sir Charles Callander and Commander E. R. Micklem have been appointed directors of Vickers, Limited.

Mr. J. Reid Young, relinquishing the secretaryship of Vickers and of Vickers-Armstrongs, is appointed Director of Finance and Administration. Mr. E. J. Waddington becomes secretary of both companies, with Mr. G. M. Dunbar as joint assistant secretary with Mr. J. A. F. Valentine.

Commander E. R. Micklem becomes deputy chairman and managing director (engineering works and shipyards) of Vickers-Armstrongs, with Major H. R. Kilner, M.C., managing director (aviation).

At an early date Sir James Callander will relinquish his position as general manager of the Barrow works of Vickers-Armstrongs, and will be succeeded by Mr. Hubert Thompson, who is at present deputy general manager of these works. Mr. P. H. Muirhead is to be deputy general manager of the Elswick, Scotswood and Chertsey works.

Sir Alexander Dunbar relinquishes the office of managing director of the English Steel Corporation, Limited, and becomes chairman. Mr. F. Pickworth is to be general manager of the Corporation, and Commander E. R. Micklem has been appointed a director.

Mr. J. Reid Young is to be a director of the Metropolitan-Cammell Carriage & Wagon Company, Limited, in place of Sir Frederick Yapp, who resigns in view of the other responsibilities he is assuming.

## *Raw Material Markets*

### IRON AND STEEL

There is beyond doubt a trade movement, affecting particularly the light-foundry trade, resulting in increased demands for castings for domestic utensils, heating apparatus, baths and other requirements. It is hoped that this demand will be gradually expanded, although it is necessary to bear in mind that the labour position at the foundries is such that they could not take a large amount of work until they had additional skilled men. In the light-foundry trade, high-phosphorus iron is the general requirement, and though there is, as yet, no stringency in supply, the situation is not without anxiety, because stocks at the furnaces are extremely low and deliveries to the foundries which are now being effected are from current make. Obviously, the Control are fully conversant with the position, and this is shown in the licensed quantities they are now permitting to be taken up by individual consumers. In many instances the tonnage asked for is whittled down considerably, the idea being to distribute the iron available as equitably as possible.

With regard to the general engineering and allied trades, including the jobbing foundries, slightly more work is coming through, but there is room for a great deal of improvement, as these foundries have felt severely the curtailment or cancellation of Government contracts. Of course, some of the foundries remain reasonably well occupied, as Government work is still extensive, and there must be from time to time urgent requirements in special castings for munitions and armaments and replacements. The pig-iron supply position to these foundries is satisfactory. There appears to be ample low- and medium-phosphorus iron and refined iron available, and at the moment there is no actual difficulty in scrap, both steel and cast-iron scrap being in reasonably good supply. These foundries also utilise in their mixtures ferro-alloys in considerable quantities, and in recent months no difficulty has been experienced in getting their requirements promptly.

The general engineering foundries would like to secure increased allocations of hematite pig-iron, but strict control remains and hematite is released to foundries only when no other type of iron can be utilised.

The suggested scheme in respect to foundry coke has not yet come into force. Meanwhile, the foundries are acquiring what supplies of coke they can and, in view of the difficulties under which the ovens are working, the position is fairly satisfactory. Many of the foundries have substantial stocks of coke which were accumulated in the summer and early autumn, but it must not be forgotten that many others rely upon regular weekly supplies forthcoming.

Although in one or two districts it is reported that the re-rollers are not so heavily committed for the future as they were, in some areas the whole of the output for the current period is taken up, and a good portion of Period I, 1945, also. They are extremely active in the production of small bars, black strip, light structural sizes and special sections, and, as this material is wanted almost entirely for Government contracts, it is essential that they have adequate supplies of billets, sheet bars, blooms, etc.

### NON-FERROUS METALS

The Non-ferrous Metals Control has decided that licences will now be granted for the acquisition of non-ferrous materials for melting into secondary ingots and/or billets for stock. All such applications must be accompanied by an undertaking from the applicant, or, if the ingots and/or billets are required to be held by the applicant's customer for his stock, then by that customer, that he will not sell or further process the ingots and/or billets until the Control's approval has been first obtained.

This is further evidence of the cautious manner in which the Control is following its policy of releasing metal wherever that course is possible without detriment to the war effort. So far only a relatively small tonnage has actually been incorporated in the manufacture of civilian goods, and it may perhaps be argued that, in view of the huge needs, current and potential, of the fighting forces for metal in the form of arms and ammunition, a cautious policy is fully justified. It is expected, however, that releases for civilian purposes will gradually be increased and involve a growing tonnage of metal. Aluminium and magnesium are now to be released to manufacturers for civilian production. They are also available, states the Ministry of Aircraft Production, to build up working stock against the time when machine tools, space and labour will become available for peacetime purposes.

# CURRENT PRICES OF IRON, STEEL AND NON-FERROUS METALS

*(Delivered, unless otherwise stated)*

Wednesday, December 6, 1944

## PIG-IRON

**Foundry Iron.**—CLEVELAND No. 3: Middlesbrough, 128s.; Birmingham, 130s.; Falkirk, 128s.; Glasgow, 131s.; Manchester, 133s. DERBYSHIRE No. 3: Birmingham, 130s.; Manchester, 133s.; Sheffield, 127s. 6d. NORTHANTS No. 3: Birmingham, 127s. 6d.; Manchester, 131s. 6d. STAFFS No. 3: Birmingham, 130s.; Manchester, 133s. LINCOLNSHIRE No. 3: Sheffield, 127s. 6d.; Birmingham, 130s.

(*No. 1 foundry 3s. above No. 3. No. 4 forge 1s. below No. 3 for foundries, 3s. below for ironworks.*)

**Hematite.**—Si up to 3.00 per cent., S & P 0.03 to 0.05 per cent.; Scotland, N.-E.Coast and West Coast of England, 138s. 6d.; Sheffield, 144s.; Birmingham, 150s.; Wales (Welsh iron), 134s. East Coast No. 3 at Birmingham, 149s.

**Low-phosphorus Iron.**—Over 0.10 to 0.75 per cent. P, 140s. 6d., delivered Birmingham.

**Scotch Iron.**—No. 3 foundry, 124s. 9d.; No. 1 foundry, 127s. 3d., d/d Grangemouth.

**Cylinder and Refined Irons.**—North Zone, 174s.; South Zone, 176s. 6d.

**Refined Malleable.**—North Zone, 184s.; South Zone, 186s. 6d.

**Cold Blast.**—South Staffs, 227s. 6d.

(NOTE.—*Prices of hematite pig-iron, and of foundry and forge iron with a phosphoric content of not less than 0.75 per cent., are subject to a rebate of 5s. per ton.*)

## FERRO-ALLOYS

*(Per ton unless otherwise stated, basis 2-ton lots, d/d Sheffield works.)*

**Ferro-silicon** (5-ton lots).—25 per cent., £21 5s.; 45 per cent., £25 10s.; 75 per cent., £39 10s. Briquettes, £30 per ton.

**Ferro-vanadium.**—35/50 per cent., 15s. 6d. per lb. of V.

**Ferro-molybdenum.**—70/75 per cent., carbon-free, 6s. per lb. of Mo.

**Ferro-titanium.**—20/25 per cent., carbon-free, 1s. 3½d. lb.

**Ferro-tungsten.**—80/85 per cent., 9s. 8d. lb.

**Tungsten Metal Powder.**—98/99 per cent., 9s. 9½d. lb.

**Ferro-chrome.**—4/8 per cent. C, £46 10s.; max. 2 per cent. C, 1s. 3½d. lb.; max. 1 per cent. C, 1s. 4½d. lb.; max. 0.5 per cent. C, 1s. 6d. lb.

**Cobalt.**—98/99 per cent., 8s. 9d. lb.

**Metallic Chromium.**—96/98 per cent., 4s. 9d. lb.

**Ferro-manganese.**—78/98 per cent., £18 10s.

**Metallic Manganese.**—94/96 per cent., carb.-free, 1s. 9d. lb.

## SEMI-FINISHED STEEL

**Re-rolling Billets, Blooms and Slabs.**—BASIC: Soft, u.t., 100-ton lots, £12 5s.; tested, up to 0.25 per cent. C, £12 10s.; hard (0.42 to 0.60 per cent. C), £13 17s. 6d.; silico-manganese, £17 5s., free-cutting, £14 10s. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £15 15s.; case-hardening, £16 12s. 6d.; silico-manganese, £17 5s.

**Billets, Blooms and Slabs for Forging and Stamping.**—Basic, soft, up to 0.25 per cent. C, £13 17s. 6d.; basic hard, 0.42 to 0.60 per cent. C, £14 10s.; acid, up to 0.25 per cent. C, £16 5s.

**Sheet and Tinplate Bars.**—£1 2s. 6d. 6-ton lots.

## FINISHED STEEL

[*A rebate of 15s. per ton for steel bars, sections, plates, joists and hoops is obtainable in the home trade under certain conditions.*]

**Plates and Sections.**—Plates, ship (N.-E. Coast), £16 3s.; boiler plates (N.-E. Coast), £17 0s. 6d.; chequer plates (N.-E. Coast), £17 13s.; angles, over 4 un. ins., £15 8s.; tees, over 4 un. ins., £16 8s.; joists, 3 in. × 3 in. and up, £15 8s.

**Bars, Sheets, etc.**—Rounds and squares, 3 in. to 5½ in., £16 18s.; rounds, under 3 in. to ⅝ in. (untested), £17 12s.; flats, over 5 in. wide, £15 13s.; flats, 5 in. wide and under, £17 12s.; rails, heavy, f.o.t., £14 10s. 6d.; hoops, £18 7s.; black sheets, 24 g. (4-ton lots), £22 15s.; galvanised corrugated sheets (4-ton lots), £26 2s. 6d.; galvanised fencing wire, 8 g. plain, £26 17s. 6d.

**Tinplates.**—I.C. cokes, 20 × 14 per box, 29s. 9d. f.o.t. makers' works, 30s. 9d., f.o.b.; C.W., 20×14, 27s. 9d., f.o.t., 28s. 6d., f.o.b.

## NON-FERROUS METALS

**Copper.**—Electrolytic, £62; high-grade fire-refined, £61 10s.; fire-refined of not less than 99.7 per cent., £61; ditto, 99.2 per cent., £60 10s.; black hot-rolled wire rods, £65 15s.

**Tin.**—99 to under 99.75 per cent., £300; 99.75 to under 99.9 per cent., £301 10s.; min. 99.9 per cent., £303 10s.

**Spelter.**—G:O.B. (foreign) (duty paid), £25 15s.; ditto (domestic), £26 10s.; "Prime Western," £26 10s.; refined and electrolytic, £27 5s.; not less than 99.99 per cent., £28 15s.

**Lead.**—Good soft pig-lead (foreign) (duty paid), £25; ditto (Empire and domestic), £25; English, £26 10s.

**Zinc Sheets, etc.**—Sheets, 10g. and thicker, ex works, £37 12s. 6d.; rolled zinc (boiler plates), ex works, £35 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £30 10s.

**Other Metals.**—Aluminium, ingots, £110; antimony, English, 99 per cent., £120; quicksilver, ex warehouse, £68 10s. to £69 15s.; nickel, £190 to £195.

**Brass.**—Solid-drawn tubes, 14d. per lb.; brazed tubes, 16s.; rods, drawn, 11⅜d.; rods, extruded or rolled, 9d.; sheets to 10 w.g., 11½d.; wire, 10⅞d.; rolled metal, 10½d.; yellow metal rods, 9d.

**Copper Tubes, etc.**—Solid-drawn tubes, 15½d. per lb.; brazed tubes, 15½d.; wire, 10d.

**Phosphor Bronze.**—Strip, 14½d. per lb.; sheets to 10 w.g.; 15½d.; wire, 16½d.; rods, 16½d.; tubes, 21½d.; castings, 20d., delivery 3 cwt. free. 10 per cent. phos. cop. £35 above B.S.; 15 per cent. phos. cop. £43 above B.S.; phosphor tin (5 per cent.) £40 above price of English ingots. (C. CLIFFORD & SON, LIMITED.)

**Nickel Silver, etc.**—Ingots for raising, 10d. to 1s. 4d. per lb.; rolled to 9 in. wide, 1s. 4d. to 1s. 10d.; to 12 in. wide, 1s. 4½d. to 1s. 10½d.; to 15 in. wide, 1s. 4½d. to 1s. 10½d.; to 18 in. wide, 1s. 5d. to 1s. 11d.; to 21 in. wide, 1s. 5½d. to 1s. 11½d.; to 25 in. wide, 1s. 6d. to 2s. Ingots for spoons and forks, 10d. to 1s. 6½d. Ingots rolled to spoon size, 1s. 1d. to 1s. 9½d. Wire, round, to 10g., 1s. 7½d. to 2s. 2½d., with extras according to gauge. Special 5ths quality turning rods in straight lengths, 1s. 6½d. upwards.

## NON-FERROUS SCRAP

**Controlled Maximum Prices.**—Bright untinned copper wire, in crucible form or in hanks, £57 10s.; No. 1 copper wire, £57; No. 2 copper wire, £55 10s.; copper firebox plates, cut up, £57 10s.; clean untinned copper, cut up, £56 10s.; braziery copper, £53 10s.; Q.F. process and shell-case brass, 70/30 quality, free from primers, £49; clean fired 303 S.A. cartridge cases, £47; 70/30 turnings, clean and baled, £43; brass swarf, clean, free from iron and commercially dry, £34 10s.; new brass rod ends, 60/40 quality, £38 10s.; hot stampings and fuse metal, 60/40 quality, £38 10s.; Admiralty gunmetal, 88-10-2, containing not more than ½ per cent. lead or 3 per cent. zinc, or less than 9½ per cent. tin, £77, all per ton, ex works.

**Returned Process Scrap.**—(Issued by the N.F.M.C. as the basis of settlement for returned process scrap, week ended Dec. 2, where buyer and seller have not mutually agreed a price; net, per ton, ex-sellers' works, suitably packed):—

Brass.—S.A.A. webbing, £48 10s.; S.A.A. defective cups and cases, £47 10s.; S.A.A. cut-offs and trimmings, £42 10s.; S.A.A. turnings (loose), £37; S.A.A. turnings (baled), £42 10s.; S.A.A. turnings (masticated), £42; Q.F. webbing, £49; defective Q.F. cups and cases, £49; Q.F. cut-offs, £47 10s.; Q.F. turnings, £38; other 70/30 process and manufacturing scrap, £46 10s.; process and manufacturing scrap containing over 62 per cent. and up to 68 per cent. Cu, £43 10s.; ditto, over 58 per cent. to 62 per cent. Cu, £38 10s.; 85/15 gilding metal webbing, £52 10s.; 85/15 gilding defective cups and envelopes before filling, £50 10s.; cap metal webbing, £54 10s.; 90/10 gilding webbing, £53 10s.; 90/10 gilding defective cups and envelopes before filling, £51 10s.

Cupro Nickel.—80/20 cupro-nickel webbing, £75 10s.; 80/20 defective cups and envelopes before filling, £70 10s.

Nickel Silver.—Process and manufacturing scrap; 10 per cent. nickel, £50; 15 per cent. nickel, £56; 18 per cent. nickel, £60; 20 per cent. nickel, £63.

Copper.—Sheet cuttings and webbing, untinned, £54; shell-band plate scrap, £56 10s.; copper turnings, £48.

## IRON AND STEEL SCRAP

(*Delivered free to consumers' works. Plus 3¾ per cent. dealers' remuneration. 50 tons and upwards over three months, 2s. 6d. extra.*)

**South Wales.**—Short heavy steel, not ex. 24-in. lengths, 82s. to 84s. 6d.; heavy machinery cast iron, 87s.; ordinary heavy cast iron, 82s.; cast-iron railway chairs, 87s.; medium cast iron, 78s. 3d.; light cast iron, 73s. 6d.

**Middlesbrough.**—Short heavy steel, 79s. 9d. to 82s. 3d.; heavy machinery cast iron, 91s. 9d.; ordinary heavy cast iron, 89s. 3d.; cast-iron railway chairs, 89s. 3d.; medium cast iron, 79s. 6d.; light cast iron, 74s. 6d.

**Birmingham District.**—Short heavy steel, 74s. 9d. to 77s. 3d.; heavy machinery cast iron, 92s. 3d.; ordinary heavy cast iron, 87s. 6d.; cast-iron railway chairs, 87s. 6d.; medium cast iron, 80s. 3d.; light cast iron, 75s. 3d.

**Scotland.**—Short heavy steel, 79s. 6d. to 82s.; heavy machinery cast iron, 94s. 3d.; ordinary heavy cast iron, 89s. 3d.; cast-iron railway chairs, 94s. 3d.; medium cast iron, 77s. 3d.; light cast iron, 72s. 3d.

(Note.—*For deliveries of cast-iron scrap free to consumers' works in Scotland, the above prices less 3s. per ton, but plus actual cost of transport or 6s. per ton, whichever is the less.*)

## SITUATIONS

FOUNDRY PLANNING ENGINEER seeks position as Foundry Manager; age 33; practical and technical training; expert repetition; fully mechanised plant, grey and malleable iron, also alloy steels; disciplinarian and good organiser; guarantee results.—Box 788, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOREMAN PATTERNMAKER (late thirties) requires change to live firm; sound experience in modern foundry methods; wood and metal plate patterns, etc.; time or price quotations.—Box 798, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

OVERSEAS MARKET.

The Indian Iron & Steel Co., Ltd., require the services of a FOUNDRY MANAGER, with experience in the production of medium and heavy grey iron castings. Experience in the production of vertical cast pipes would be an advantage. The successful applicant would be given a 4 years' contract, with a minimum salary of 1,100 Rupees per month (£82), with free passages, medical attention, unfurnished quarters, and Provident Fund.

Applications in writing (no interviews), stating date of birth, full details of qualifications and experience, including present employment; also Identity and National Service or other registration particulars, and quoting reference No. O.S. 481, should be addressed to the MINISTRY OF LABOUR AND NATIONAL SERVICE, Appointments Department, Sardinia Street, Kingsway, London, W.C.2.

WORKING MANAGER wanted for Small Foundry, Cornwall; light agricultural castings, rapidly developing; excellent prospects; good wages for right man.—Box 796, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

WANTED. — Head Foreman for specialised ironfoundry in North Midlands; knowledge of high duty and alloy irons an advantage; the position is a permanent one, and there are good opportunities for the future.—Applicants should write to the Manager, MINISTRY OF LABOUR AND NATIONAL SERVICE, Employment Exchange, Chesterfield.

## PROPERTY

AN OPPORTUNITY SELDOM OCCURRING. — Old - established Foundry Premises; outskirts flourishing market town; adjacent to railway and trunk road; existing buildings approximately 6,400 sq. ft.; total area 1 acre; same hands over 30 years; easily adaptable for light engineering, foundry, warehousing, garage of large vehicles, etc.; main services, good offices; immediate possession; price without plant, £4,000; open to reasonable offer; plant can be left if required—Apply JACKSON STOPS, Castle Street, Cirencester (Folio 7783).

## BUSINESSES FOR SALE

IRON and BRASS FOUNDRY Business; established 1894; Glos.; stone and brick buildings; 3,000 sq. ft.; cranes and machinery; castings up to 5¼ tons; price £4,750.—Full particulars from HENRY BUTCHER & Co., 73, Chancery Lane, London, W.C.2. Telephone No.: Holborn 8411 (5 lines).

## BUSINESSES FOR SALE—*contd.*

FOR SALE.—SOUTH WALES: LARGE OLD - ESTABLISHED NON-FERROUS FOUNDRY AND ENGINEERING WORKS AS A GOING CONCERN; BUILDINGS COVERING LARGE AREA; EXCELLENT FACILITIES; CAPABLE LARGE OUTPUT; ROOM FOR EXTENSIONS; ENQUIRIES INVITED.—Box 802, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

## MACHINERY

WANTED.—Hand Ram Moulding Machines; any type; state condition.—Box 800, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

HOLLAND/SLM 2-STAGE WATER-COOLED ROTARY AIR COMPRESSOR; size K.55/40; capacity 305 cub. ft. air per min. at 100 lbs. pressure, or 275 cub. ft. at 150 lbs. pressure; complete with 3 ft. by 7 ft. air receiver 100 lbs. pressure; intercooler, automatic unloader, with electro-pneumatic switch; extended bedplate to take motor, 65 h.p., to drive at 100 lbs. pressure.

DITTO MACHINE.

HOLLAND/SLM SINGLE STAGE WATER-COOLED ROTARY AIR COMPRESSOR; size K.40; new 1941; capacity 177 cub. ft. per min. at 60 lbs. pressure; requiring 41 h.p. to drive at 980 r.p.m.; complete as above.

12 in. by 18 in. REAVELL ROLLING DRUM ROTARY LOW PRESSURE COMPRESSOR; capacity 670 cub. ft. per min. at 940 r.p.m. at 15 lbs. pressure; requiring 54 h.p. to drive; at present direct coupled to 20 h.p. Verity S.R. motor, 400/440 volts, 3-phase, 50 cycles, 940 r.p.m.; having capacity of 900 cub. ft. per min. at 3 lbs. pressure.

NEWMAN INDUSTRIES, LTD., YATE, BRISTOL.

Broadbent Brick Crusher Jaws 8 in. deep.

6-ft. Bonvillain Flat Plate 2-Roller Sand Mill.

Herbert's "Cloudburst" Hardness Testing Machine, by Massey; 3/50/550 volts; 1,430 r.p.m.

Morgan Type "S" Oil-fired Tilting Furnace; 400-440 lbs. capacity.

5-ft. Under-driven Stationary Pan Sand Mill.

Jackman Foundry Sand Riddle.

Electric Vibratory Sand Riddle; 2/50/200 volts.

Sand Mills; 5 ft., 4ft. 6 in., and 5 ft. 6 in.

S. C. BILSBY, Crosswells Road, Langley, Birmingham.

AVERY DUST WEIGH HOPPER; having hopper 5½ ft. dia. by 3 ft. deep on the straight, with 5 ft. 8 in. conical bottom tapering to 12 in. outlet; carried in mild steel framework, and connected to 28 in. dia. AVERY Weighing Machine, capacity 15,000 lbs. in 5 lbs. divisions; new 1935.

DITTO PLANT, but Weighing Machine 10,000 lbs. capacity.

DITTO PLANT, but fitted with mild steel Tank, 10 ft. long by 3½ ft. wide by 3 ft. deep in place of hopper.

10,000 lbs. capacity AVERY Dial Weighing Machine; graduated in 5 lbs. divisions for use with tanks or hopper.

NEWMAN INDUSTRIES, LTD., YATE, BRISTOL.

## THOS. W. WARD LTD.

LANCASHIRE BOILER; 30 ft. by 8 ft. by 120 lbs. w.p.

COCHRAN MULTI - TUBULAR BOILER; 11 ft. 3 in. by 5 ft. by 100 lbs. w.p.

VERTICAL MULTI - TUBULAR BOILER; 4 ft. by 1 ft. 8 in. by 80 lbs. w.p.

VERTICAL CROSS-TUBE BOILER; 7 ft. 6 in. by 3 ft. 2 in. by 80 lbs. w.p.

VERTICAL CROSS-TUBE BOILER; 10 ft. 6 in. by 4 ft. 3 in. by 80 lbs. w.p.

VERTICAL CROSS-TUBE BOILER; 7 ft. by 2 ft. 9 in. by 80 lbs. w.p.

PORTABLE BOILER and ENGINE; 30 b.h.p.; 120 lbs. w.p.

Good secondhand 2 in. by 1 in. by 3/16 in. section ANGLES; available for immediate delivery, subject unsold, in random lengths 10 ft./12 ft. 11 in.

Good secondhand 3 in. by 2 in. by 5/16 in. section STEEL TEES; in about 15 ft. lengths; immediate delivery, subject unsold.

LARGE AND VARIED STOCK GOOD SECONDHAND ROLLED STEEL JOISTS, ANGLES, CHANNELS, ROOF PRINCIPALS, ETC.

LOW PRICES. QUICK DELIVERY.

ALBION WORKS, SHEFFIELD.

'Grams: "Forward." 'Phone: 26311 (15 lines).

## MISCELLANEOUS

WANTED.—Castings of a small repetition character, *i.e.*, suitable for plates approximately 15 by 13.—Please reply, giving particulars of capacity, to Box 804, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

SAFEGUARD your Foundrymen against Burns; asbestos gloves, mitts, gauntlets, leggings, capes, hoods and overalls; ex stock or to specific designs.—SOMMERFIELDS, 8, Camden Road, N.W.1. Gulliver 3443-4.

JOHN REDGATE (IRONFOUNDERS), LTD., CROCUS STREET, NOTTINGHAM, have capacity available for about 2 tons of Grey Iron Castings weekly, and will be glad to receive enquiries.

NON-FERROUS capacity available up to 1½ cwts.; good deliveries, at competitive prices.—WARWILL, LTD., Abertillery. 'Phone 71.

GREY IRON and Alloy Castings up to 2 tons; prompt deliveries.—Please send enquiries to WARWILL, LTD., Abertillery. 'Phone 71.

'Phone: 22877 SLOUGH

**NEW SHOT BLAST CABINET PLANTS with motor driven Exhaust Fans, complete, all sizes; air compressors to suit in stock, also motors if required.**

**Britannia large size plain jolt and pattern draw moulding machine, 8 in. dia. cylinder, table 4 ft. x 3 ft. reconditioned.**

**Genuine Morgan lip axis 600 lbs. capacity furnace.**

**Pneulec swing frame Grinder, motorised, as new.**

**Jackman taper roll Sand Mill, reconditioned.**

**Several good Foundry Ladles 1 ton to 10 tons capacity.**

**Alex. Hammond,** Foundry Machinery Merchant.

14 AUSTRALIA Rd. SLOUGH

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