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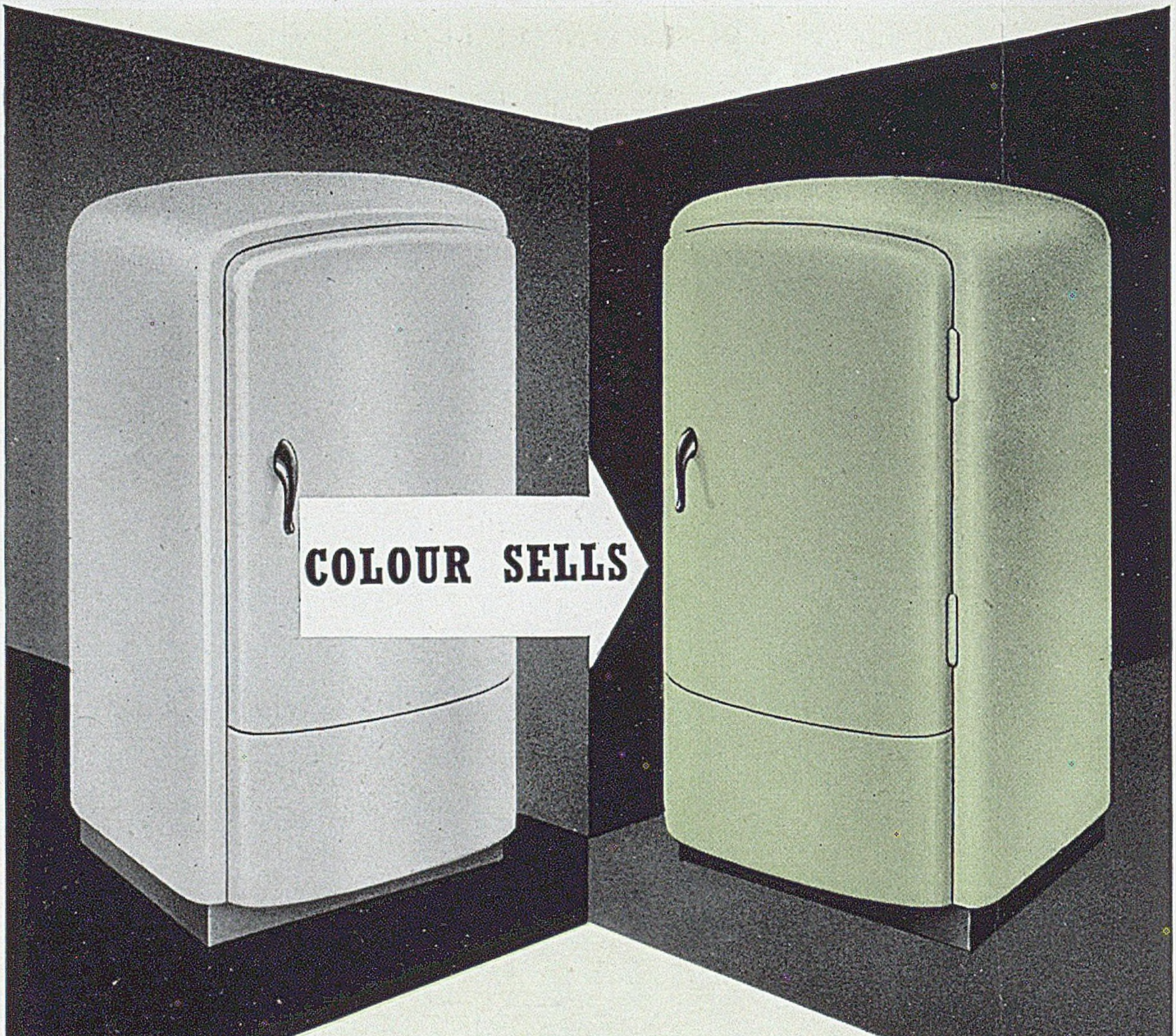
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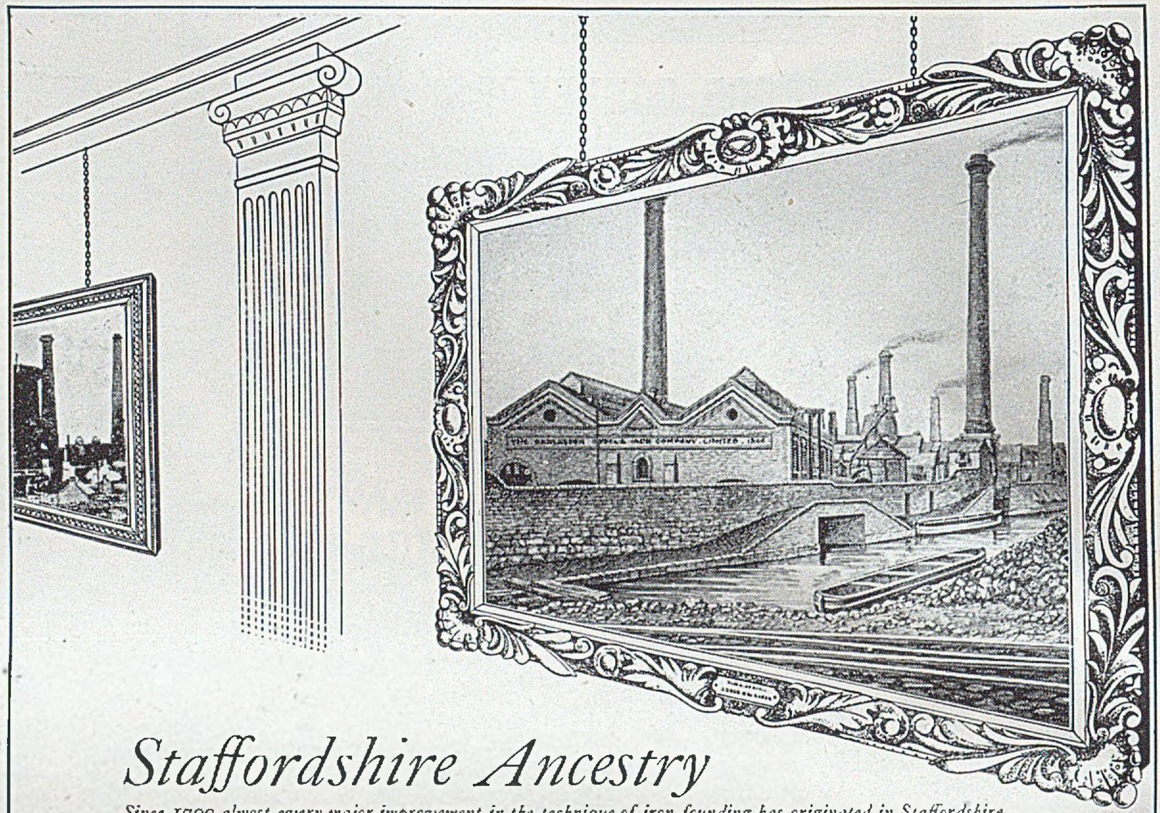

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Fordath New Type Sand Mixer, Model "Ca": Batch capacity $\frac{3}{4}$ cwt

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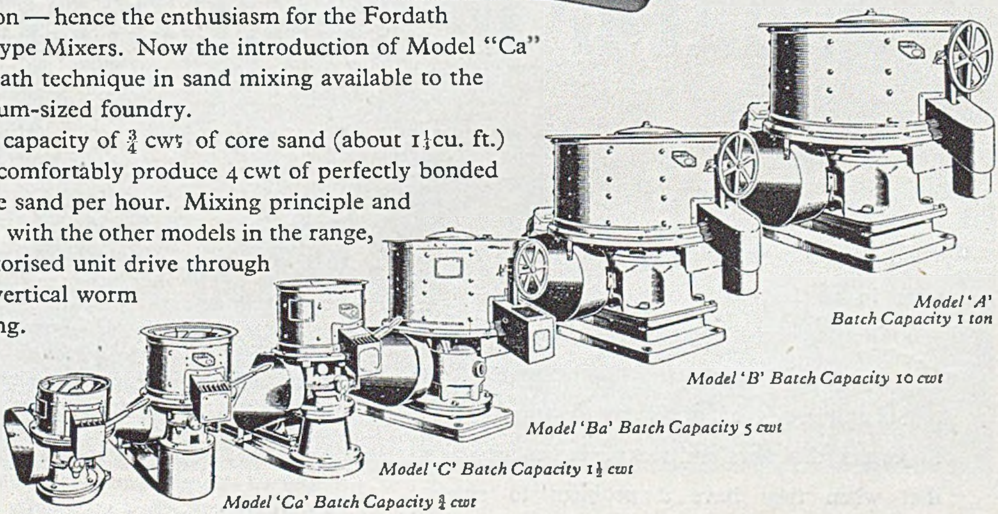
THE FORDATH RANGE OF NEW TYPE MIXERS



Model 'A' Batch Capacity 1 ton

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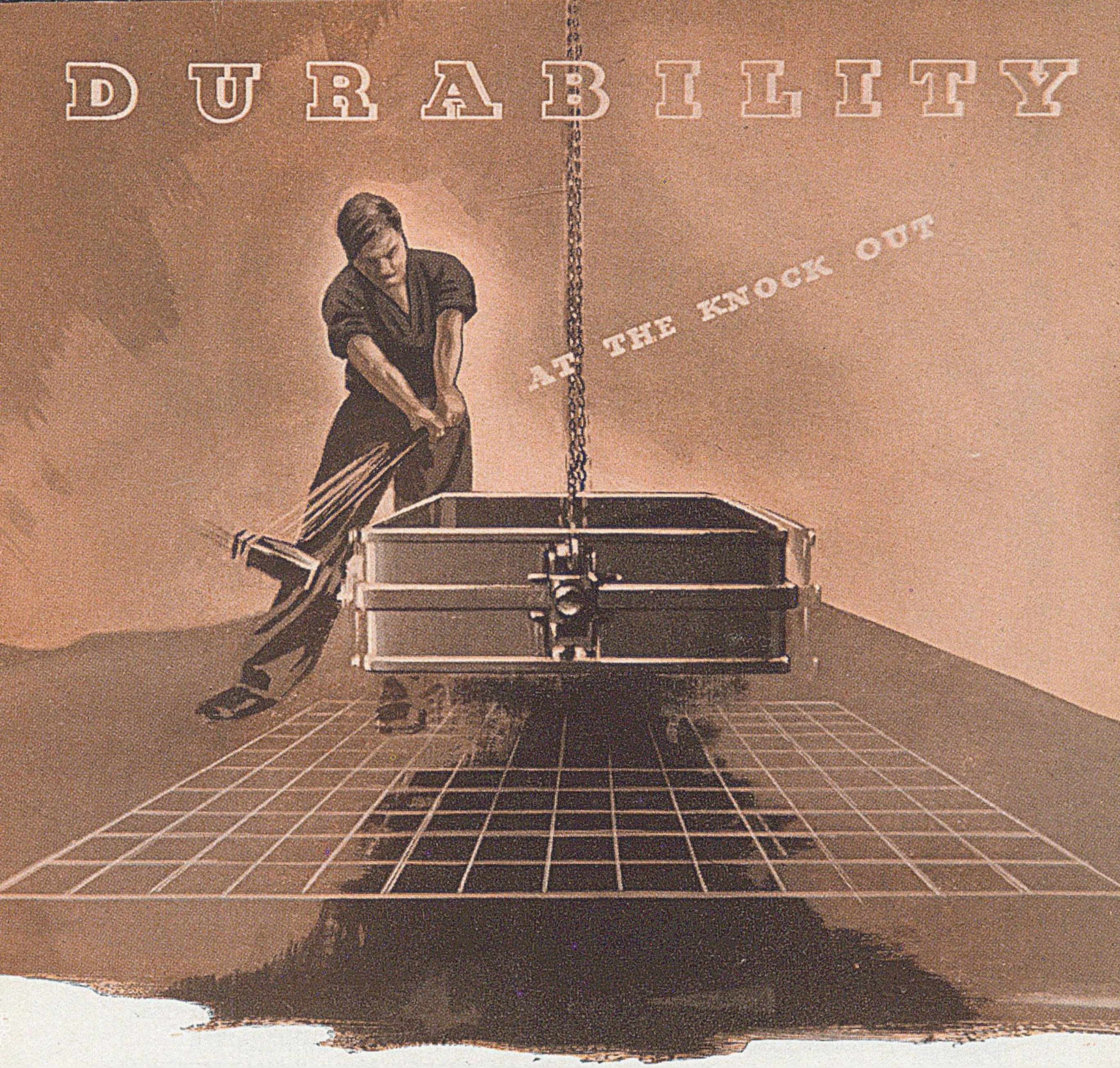
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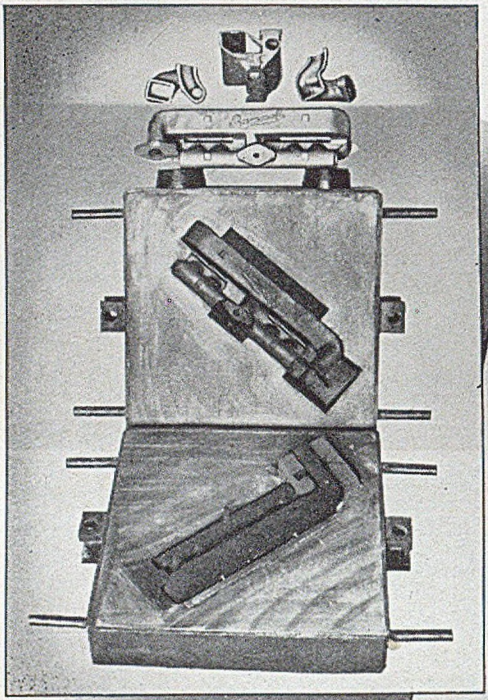

Success in Castings manufacture is dependent on the observance of certain principles applicable to all types of work, and amongst these is the selection of suitable sands and their proper treatment.

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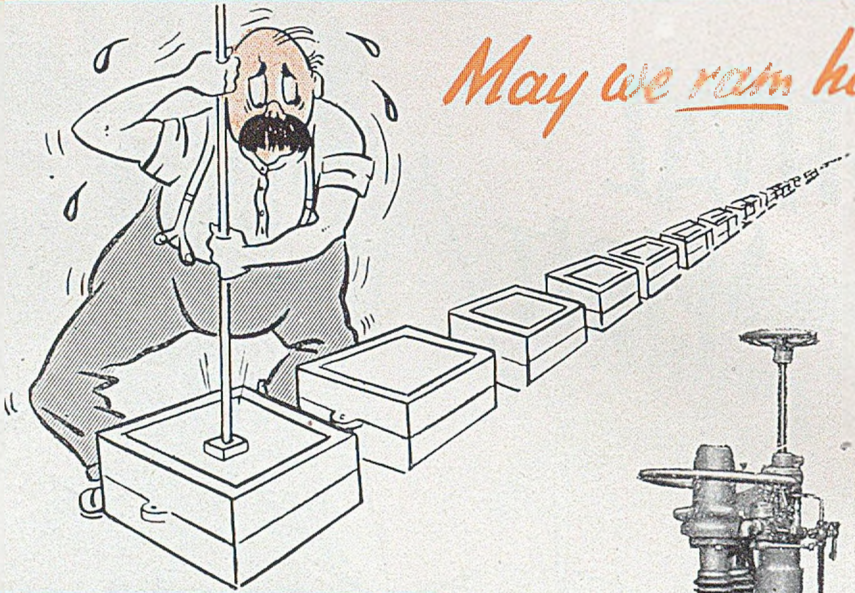
May we ram home . . .



. . . *the fact* that Molineux Machines not only make moulds, they make *more* moulds, bigger pay packets and improve management—worker relations. A Midlands Foundry with nine Molineux Machines makes 500 to 700 boxes per machine per day. One man "cores up" and "closes" for two Moulding Machines. Thus three men make 250 to 350 complete moulds per eight hour day. Box size is 16in. by 14in. by 4½in. each part. Two-parted boxes. Machines have been in service for five years.

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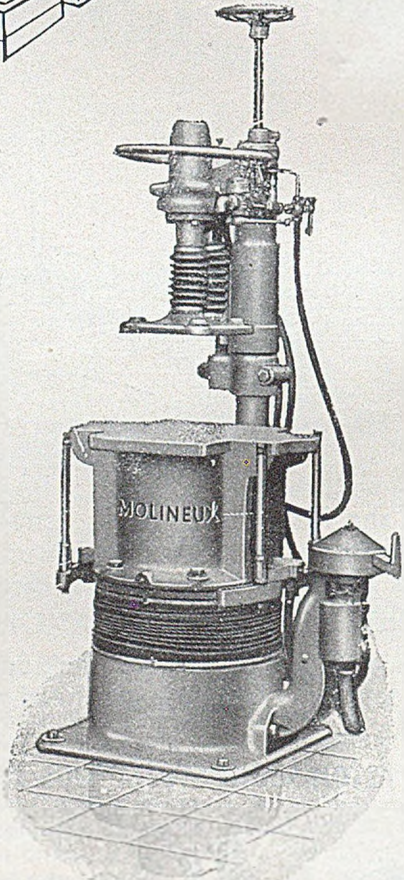

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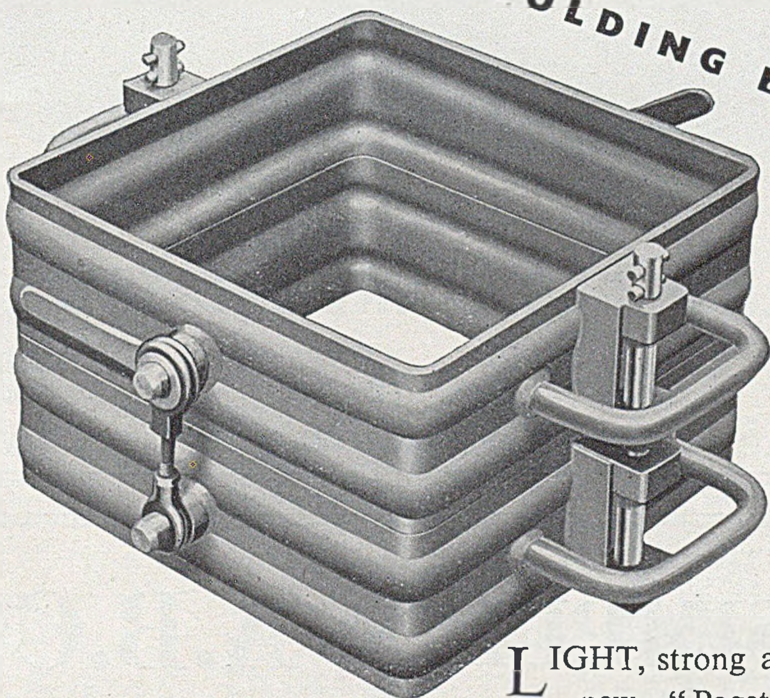

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The Paris Congress

The 24th Congress of the *Association Technique de Fonderie* was somewhat different from the earlier ones. Primarily the choice of the month of June gives a better chance of good weather than early October. A second change was that the meetings were held in a new hall forming part of the *Maison de Fonderie*—a building belonging to the employers' federation. The older part of the building is of the baroque type and possesses noteworthy decorations, such as statuary, beautifully-painted ceilings, and magnificent furniture. Here at last the French foundry industry possesses a headquarters worthy of its fundamental place in the country's economic structure. The new hall, capable of seating two to three hundred people, is of dignified design, incorporating white and cream walls and pale yellow curtains to hide the lantern screen. Excellent ceiling lighting; good accoustics; controlled atmosphere, and comfortable seating provide the very best conditions to be associated with a lecture theatre. A slight fault which needs remedying is the untidy tangle of wires across the stage, serving the microphones and speech-recording apparatus.

There was a very full programme of technical Papers—twenty or more—which required about 18½ hours for presentation, and necessitated for each of the three days a start at half-past eight. We know our French friends will not take it amiss when we suggest the possibility of economising time by the holding of simultaneous sessions, as the numerous Papers submitted admit of logical division into study groups. The British Exchange Paper was this year delivered by Mr. V. C. Faulkner, who outlined our unco-ordinated, yet quite satisfactory, training schemes for apprentices and technicians. The major awards—called medals, but really very handsome plaques—went this year to Mr. Le Thomas; Mr. Brizon; Mr. Guy Henon; Mr. Chavy, and Mr. Lecoeuvre. The international reputation which these gentlemen have gained has now been recognised in their own country, and we congratulate them. There was the usual quota of foreigners present, amongst whom were Mr. Spies, the president of the International Committee of Foundry Technical Associations; Mr. Goffart from Belgium; Mr. Sissener from Norway, and Mr. Noel Newman, Dr. Pearce, Dr. Everest and Mr. V. Delport from this country. Mr. D. Waeles, the president, has well maintained the high reputation set by a distinguished line of chairmen, and was particularly assiduous in his personal care for his overseas guests. As usual, the hospitality offered was more than generous, and of the standard which only Paris can provide. Very sincerely do we thank the members and officers of the A.T.F. and also Mr. Ricard, the managing director of the "Centre Technique." The foundry industry of the world has built up an edifice of fruitful co-operation during this last quarter of a century, which merits careful fostering. Thus we hope to see a really representative gathering of the associated nations at Brussels next September.

Notes from the Branches

Middlesbrough

At the Annual General Meeting of the Middlesbrough branch of the Institute of British Foundrymen at the session's close the following officers were appointed:—As *branch president*, Mr. H. Marshall; *as senior vice-president*, Mr. E. W. Dowson; as *junior vice-president*, Mr. G. B. Brand; as *representatives to general council*, Mr. J. K. Smithson and Mr. Wilson; as *technical council representative*, Mr. L. Johnson. Among the appointments to the *council* were those of two members who have never held office with the branch before, Mr. Peter Downing and Mr. Chadwick.

The retiring president, Mr. L. Johnson, made a short speech thanking members for their co-operation and welcoming the new president, Mr. H. Marshall.

After the meeting, the members heard an interesting lecture given by Mr. G. W. Nicholls of Modern Foundries Limited, and Mr. Charlton of C. A. Parsons & Company, Limited, who were members of the grey-iron productivity team which visited America. These two gentlemen gave a very interesting discussion on many aspects of iron founding in the U.S.A. but kept strictly within the matter published in the Report.

Balfour's "At Home"

An "at home" with a difference has been arranged by Mr. Lindsay Burns, works director of Henry Balfour & Company, Limited, gas and chemical engineers, of Durie Foundry, Leven, Fife. On the afternoons of Tuesday, June 26, and Thursday, June 28, to coincide with the local Festival week, friends and relations of employees are to have an opportunity of seeing over the factory under normal working conditions.

This event is typical of the closer co-operation between labour and management which Mr. Burns is so anxious to foster. Workers in this factory by the sea on the east coast of Scotland already have excellent welfare facilities. For many years there has been a medical department with a qualified nurse in attendance under the supervision of the works' doctor; in this way the health of the ordinary worker is continually safeguarded. Other workers who might require special watching in the interests of their health are regularly X-rayed. Visitors to the factory during the "at home" will have an opportunity of seeing much important chemical and other plant in course of assembly, and also see the industrial X-ray equipment used for examining welds under Lloyd's Class 1 standard for pressure vessels.

THE REPORT of Peat, Marwick, Mitchell & Company, appointed last March to investigate the position, discloses "a serious state of affairs," according to a circular accompanying the 1950 accounts of the London Aluminium Company, Limited. The full accounts show that a credit balance of £31,903 brought in has been converted into a debit of £188,995, as contained in the preliminary statement.

The accountants report, adds the circular, that the 1949 accounts were seriously wrong.

Institute's New President

Mr. Colin Gresty

Mr. Colin Gresty, who was elected this week to the presidency of the Institute of British Foundrymen, is a national figure in the foundry industry, in which he is esteemed and respected by a large circle of friends. He is general foundry manager and chief metallurgist of the North Eastern Marine Engineering Company (1938), Limited, Wallsend-on-Tyne and Sunderland, and their associated companies, Richardsons, Westgarth & Company, Limited, Hartlepool, and George Clark (1938), Limited, Sunderland. Early in 1912 Mr. Gresty entered the metallurgical laboratory of North Eastern Marine, being appointed chief metallurgist in 1926, foundry manager in 1927, and general foundry manager and chief metallurgist (the position he now holds) in 1938, when the three firms mentioned above became associated.

Mr. C. Gresty.

During his long period of membership of the Institute of British Foundrymen—he became a member in 1917—Mr. Gresty has had many years' experience on the General Council. He was secretary of the Newcastle branch from 1924 to 1927, branch president in 1928-9 and again in 1937-8. He is a member of council and of the technical committee of the Council of Ironfoundry Associations, of the council and of the research board of the British Cast Iron Research Association, a member of the Iron and Steel Institute, and of the Institute of Metals. He is president of the National Ironfounding Employers' Federation, and was a member of the "Garrett" committee on conditions in iron foundries, being retained on the Joint Standing Committee on Conditions in Iron Foundries which arose from it.

Institute of British Foundrymen *Annual Conference* 1951

Craftsmanship in the Foundry

Presidential Address by Colin Gresty

It is 34 years since I joined the Institute and to-day I feel a proud man and very greatly honoured at having been elected your president. At the same time I feel rather over-awed at the prospect of following such a long line of distinguished holders of this office. I can assure you that I am well aware of the heavy responsibilities which rest on my shoulders, but I hope that, with the help I know I shall get from you all, I shall be able to uphold them.

The choice of a subject for this Address has been by no means easy to make, not least because probably every aspect of foundrywork has been covered, at all events to some extent, by previous addresses. I propose, therefore, not to worry too much about this, but to deal with certain matters which, in my opinion, are of outstanding importance in our industry to-day.

A few months ago I was very much impressed by the remarks made by one of our loam moulders on the occasion of a presentation made to him on his retirement after 55 years' service in one of our foundries. He said that foundrywork was a grand craft and that, if he had to start life again, he would not wish to make any change; moreover, that after more than 50 years' practical work he was still learning. In those few words, spoken from the heart, that man expressed two fundamental truths about foundrywork: (1) that it is indeed a "grand" craft, and (2) that even a lifetime is not long enough to master all its problems.

Pride of Craft

This intense pride of craft, which still imbues many of the older craftsmen, is unfortunately not so evident in the younger men to-day. There are many reasons no doubt why this is so, the principal one being unquestionably the economic effects of two major wars during the last 37 years. Nevertheless it is a matter to be greatly deplored, because this pride of craft, this satisfaction in a difficult job well done, has a very high moral value in urging a man to give his best under all circumstances. Surely it is the finest incentive in the world because it satisfies something in a man's make-up that cannot be matched in its effect by incentives of a purely material character. I look upon this Institute as the most powerful influence to-day for the encouragement and development of pride of craft, provided that it continues its policy of building up its membership from *all* grades of foundrymen.

In speaking thus of foundry craftsmanship, you will appreciate that I am not referring only to that of moulders and coremakers, but broadly to that of all those other skilled people—patternmakers, metallurgists, engineers—who are part and parcel of the industry to-day and who, largely by their joint efforts, have enabled much progress to be made. Thus, the skill of the patternmaker is no longer confined to the production of large and small wooden patterns, but, coupled with that of the foundry engineer, has rendered possible the mass production of intricate castings by methods mainly of a mechanical character.

Metallurgical Skill

The science of the metallurgist—in particular his skill at applying it in the foundry and assisting in developing the production technique of special processes—has resulted in new casting alloys for a large variety of purposes and in great improvement in the mechanical properties of some of the older metals and alloys. Thus, to quote one example, at the beginning of the 1914-18 war—*i.e.*, less than 40 years ago—the British Admiralty Specification for cast iron called for a minimum tensile strength of 9 tons per sq. in. I well remember that when, during the war, this requirement was raised to 11 tons per sq. in. for certain castings, there was considerable perturbation in foundry circles. To-day, as you all know, cast iron having a tensile strength of over 40 tons per sq. in. can be produced. Then there are the phenomenal developments which have taken place in the light castings industry, whereby the demand for the production of large numbers of complicated castings, very light in weight and high in strength, have been met. New alloys, having the required properties, have been produced and new methods and processes developed. Similarly, when we turn to the steel-castings side of the industry, we find a record of great progress in the development and production of alloy-steel castings, particularly for heat-resisting, wear-resisting and other special purposes.

Again, for some very high-duty applications, such as turbine blades and other parts for gas turbines, we have certain nickel/chrome and cobalt/chrome alloys, coupled in some cases with the refined technique of precision investment casting—a modern adaptation of the old "cire perdue" or "lost wax" process. Added to this record of progress is the fact that, notwithstanding the present serious shortage of skilled labour, the total production of castings is at a very high level, probably higher than ever before.

Malicious Propaganda

Taking into consideration all these factors I have outlined, it is most unfortunate that, during the last few years particularly, the industry has been subjected to exaggerated propaganda about its working conditions. The chief result of this propaganda, *Craftsmanship in the Foundry*

and one which has had a disastrous effect on recruiting, is that the popular idea to-day is that a foundry is not a good place in which to work, instead of being known as a place where astonishingly clever things are done and where craftsmanship of a high order prevails. It is my view that the industry has a great deal more of which to be proud than of which to be ashamed.

In expressing this view I do not wish to be misunderstood in any way. I have been closely connected for some years with the subject of improved working conditions and am fully aware of its importance. I am well aware also, however, that some of the problems in this connection are very difficult to solve and call for much research and experimental work. It is essential, therefore, to keep a proper sense of proportion in these matters and never to lose sight of the fact that the prime function of a foundry is to produce castings.

In the Report of the chief inspector of factories for 1949, which contains a notably large section devoted to foundries, the industry receives just credit for the considerable progress made in certain directions, notably in the provision of washing facilities, clothing accommodation, improved lighting and other mattters. This progress has been continued and extended in 1950. You will appreciate, however, that these are comparatively straightforward matters, depending largely on funds and space being available to carry them out.

The same Report also draws special attention to the more difficult and complex problems of ventilation and means of suppressing dust, fumes and smoke, pointing out in particular the absence of reliable data for the design of ventilating apparatus. Progress on these matters is inevitably rather slow because, as already indicated, it depends very largely on research and experimental work.

Dust Hazard

At this Conference, as you know, there are to be two Papers on the subject of dust, one of which includes a film on "Dust Flow." These Papers cover a great deal of practical research work and describe certain new techniques which have been developed and which will, I think, become increasingly applied to the investigation of dust problems in foundries. I think you will agree, if you see the film, that we still have a great deal to learn about the whole subject, that these new techniques will enable us to get our teeth into the problem in a way which has hitherto not been possible, and that we may look forward to steady progress.

You will also agree that, in dealing with the air in the foundry which we have to breathe, we are tackling something of great importance to all those engaged in the industry. I wish to make a special appeal to you all for co-operation in this work and especially to those connected with jobbing foundries. As usual with many of our problems whether related to labour, production methods, equipment or costing—jobbing foundries present the greatest difficulties, due to the very varied character and range of size of their work. In shops which cater for such work, the segregation of dusty processes and plant is a much greater problem than in mechanised or partly mechanised foundries.

The various Committees working on the closely related subjects of the suppression and removal of dust, smoke and fumes, viz., the Foundry Atmospheres Committee of the British Cast Iron Research Association, the British Steel Founders' Association Research & Development Division, the two Factory Department Committees known as the Dust in Steel Foundries Committee and the Joint Standing Committee on Conditions in Iron Foundries, all require facilities for carrying out investigational work in foundries and for trying out new ideas. In addition—and I consider this a very important point—there is ample scope for individual thought and experiment in trying to solve some of the many interesting and intricate problems which exist in every foundry. If you are successful in curing any of your own troubles, then your method, if made known, may help others.

Logical Approach

First of all, however, I would like to remind you of the well-known proverb "Prevention is better than cure" which points the way to the first line of attack on any dust or similar problem. If it is possible by a change of method, of material or by any other means, orthodox or unorthodox, to avoid the production of dust at any operation, without introducing other still greater problems, then that is an ideal solution.

Secondly, if it is impossible to avoid producing dust, the next line of attack is to confine it to the smallest possible space and get hold of it by wetting it or by exhausting it and carrying it out of the building. It will be appreciated that the main object is to prevent its dispersal into the general atmosphere of the shop, from which it is much more difficult to remove.

I am strongly of the opinion that the solution of many of these highly practical problems can be found along the lines indicated, that is, by the exercise of individual ingenuity. One or other of the committees mentioned will, I am sure, be only too pleased to act as a channel for the dissemination of knowledge gained, which will, in fact, help them also in their research work on the more fundamental factors involved.

In conclusion, I return to the main thought behind my remarks, namely, that foundrywork should not be decried—it is a "grand" craft in the broadest sense of the term, has a fine record of progress and the industry is taking very active steps in an endeavour to solve the difficult problems relating to the improvement of working conditions.

JAPANESE PRODUCTION of pig-iron, steel ingots and rolled steel in March was at post-war record levels, according to preliminary figures. In the rolled steel category, new records were established in the fabrication of shapes, hoops, and plates.

The following are preliminary figures for March, with the February totals shown in parentheses:—Pig-iron, 234,844 (198,068) metric tons; steel ingots, 511,809 (443,880) tons; rolled steel, 388,070 (369,625) tons.

Elected Senior Vice-President

Dr. C. J. Dadswell

C. J. Dadswell, Ph.D., B.Sc. (Eng.), M.I.Mech.E., *Ingénieur* E.S.F. (Paris), F.R.S.A., who has been elected as senior vice-president of the Institute of British Foundrymen, is a director of English Steel Corporation, Limited, Sheffield. He was born at East Grinstead, Sussex, in 1906, and began his education at Shoreham Grammar School, continuing at the Brighton Technical College and University College, London. He obtained his doctor's degree following post-graduate research work under the late Professor E. G. Coker, D.Sc., F.R.S.

After a short time with the L.M. & S. Railway carriage and wagon departments, he gained steelworks experience with Cammell Laird & Company, Limited, Sheffield, and at the Grimesthorpe Works of English Steel Corporation, Limited, Sheffield. While he was

Dr. C. J. Dadswell.

there, in 1933, he was awarded the Robert Blair Travelling Fellowship, and went abroad to study at the Foundry High School in Paris, also working in several Continental foundries. On his return, he worked for nearly a year as a moulder in the iron, brass and steel foundries of Vickers-Armstrongs, Limited, at Barrow-in-Furness. As a result, in 1935 he was the first British subject to be awarded the diploma of *Ingénieur de l'Ecole Supérieure de Fonderie (Paris)*. Returning to Sheffield, he became steelfoundry manager at the Grimesthorpe Works of English Steel Corporation, Limited.

During the war he was attached to the Ministry of Supply (Iron and Steel Control) as a director, and developed a number of specialist foundries.

In 1943 Dr. Dadswell returned to English Steel Corporation, Limited, as superintendent of the drop-forge department, later being appointed a special director. In 1946 he was elected to the Board, and is now in charge of the sales and production of drop forgings, steel castings and springs.

Dr. Dadswell is a past-president of the Sheffield branch of the Institute, has served on technical committees of the Institute and other societies, and has presented a number of Papers to branches and the Annual Conference. He is a member of the executive

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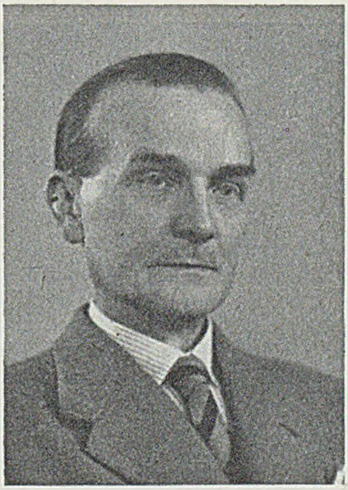
Junior Vice-President

Mr. E. Longden

Mr. E. Longden, M.I.Mech.E., junior vice-president of the Institute of British Foundrymen for 1951-52, received a practical training in the foundries of the British Westinghouse Company, now Metropolitan-Vickers Electrical Company, Limited, Manchester. He acquired a technical education in metallurgy and related subjects at the Manchester College of Technology, followed by studies in economics, engineering subjects and works management. He has occupied positions of foundry and patternshop manager with Tangyes, Limited, Birmingham, John Hetherington & Sons, Limited, Manchester, and Craven Bros, Limited, Stockport. Latterly, he held the position of works manager with David Brown-Jackson & Company, Limited, Salford. He resigned from this post to practise as a consulting foundry engineer.



Mr. E. Longden.

Mr. Longden has carried out much research work on a practical foundry scale. He has contributed extensively to foundry technical literature and has presented many papers to the Institute's branches and annual conferences. Following upon diploma awards, Mr. Longden was, in 1926, awarded the Oliver Stubbs Gold Medal and, in 1944, the British Foundry Medal and Cash Award. He was the Lancashire branch president in 1928-9-30 and has served on the General Council and its Committees since 1926. In 1937, he prepared the Institute's official exchange paper to the *Association Technique de Fonderie (France)* and, in 1948, the Institute's official exchange paper to the American Foundrymen's Congress at Philadelphia. Mr. Longden has travelled extensively in the U.S.A. and European countries and gained a wealth of experience which he is always ready and willing to impart to the younger generation.

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council of the British Steel Founders' Association, vice-chairman of their Research and Development Division, and chairman of the Lancashire and Yorkshire region of that Association. He is also a member of the steel-castings panel of the British Iron and Steel Research Association, the Institution of Mechanical Engineers, and the Iron and Steel Institute. He is also chairman of the Back-Up Roll Makers' Association.

Bradley & Foster Golf Competition

About 35 golfers, many from the staffs of Midlands foundries, entered the Golf Competition on Friday last organised by Bradley and Foster Limited, for the T. A. McKenna cup. The two-ball handicap round was won by Mr. F. Arnold Wilson who returned a net score of 74. The weather was perfect and all, including the "rabbits," enjoyed the afternoon's golf on the Whittington Barracks Course, Lichfield, and the tea in the Golf House afterwards for which the Company were hosts. Later in the day, the Company again entertained their guests, this time at dinner in the George Hotel, Lichfield. On this occasion, Dr. J. E. Hurst, chairman, asked Mr. J. J. Sheehan to present the trophy, mentioning that the function was now 18 yrs. old. The presentation of the cup and a miniature for permanent holding was made to Mr. Wilson amid applause, and suitable acknowledgement was made.

Our picture shows the presentation of the Cup to Mr. F. Arnold Wilson by Mr. J. J. Sheehan, B.Sc. (retiring president, Institute of British Foundrymen). Also in the picture are (from left to right) Mr. D. W. S. Hurst, Mr. G. E. Lunt, Mr. W. Lawson-Hurdman, Mr. K. Marshall (director, Joint Iron Council), Mr. R. J. Rogers and Dr. J. E. Hurst (managing director, Bradley & Foster, Limited, and president, Institute of Vitreous Enamellers).

House Organ

Simplex and Creda News, No. 11, Series 51. Published by Simplex Electric Company, Limited, Broadwell, Oldbury, Birmingham.

This house organ takes the form of an eight-page news sheet. The frequency of its production is not indicated, but it is probably weekly. The paper certainly lives up to its title "News," for it is essentially "newsy." The first item which attracted the reviewer's notice was the overcoming of a difficulty in obtaining tickets for the Festival Grounds in London. It seems strange that at 10.30 on the day of writing this, the queue consisted of three police—two men and a woman! So it is not overcrowding which has created a shortage. The major news in this issue is the opening of the Creda Club, which is covered by a full page of pictures.

Leaders of the Industry

Dr. R. W. Bailey

R. W. Bailey, D.SC., F.R.S., presented the Edward Williams Lecture at the Annual Conference of the Institute of British Foundrymen at Newcastle this week. The lecture is entitled "The Properties of Materials and the Engineering Uses of Cast Metals," and is published on the adjoining pages.

Dr. Bailey served an apprenticeship to mechanical engineering at the Stratford Locomotive Works of the Great Eastern Railway Company where he gained a Whitworth Exhibition. He attended Queen Mary's College (then East London College) as a Directors' Scholar and gained a Whitworth Scholarship which was held partly at the City and Guilds Central Technical College upon a special electrical-engineering course, and partly as an electrical-engineering apprentice with the British Westinghouse Company, Manchester. He became a lecturer in mechanical engineering at the Battersea Polytechnic Institute and afterwards for seven years was principal of the Crewe Technical Institute.

Dr. R. W. Bailey.

In 1919 he returned to the British Westinghouse Company, Manchester, to take charge of the mechanical engineering and chemical laboratories, and later also the metallurgical laboratory in the Company's research department, where as one of his duties he carried responsibility for all high-duty castings and forgings. During many years he devoted attention to mechanical engineering problems concerned with the strength and design of important parts of power plant, giving particular attention to the behaviour and operation of metals at elevated temperatures and high stresses in which branch he was a recognised authority. Important advances in the use of special steels for steam- and gas-turbines have resulted from his own work and that of the research section under his control. For a paper dealing with the utilisation of creep-test data in engineering design he was awarded in 1935 the Hawksley Gold Medal by the Institution of Mechanical Engineers. A D.Sc. (Engineering) degree of London University was conferred upon him for his published work.

In 1945 he relinquished administrative duties to allow his increased attention to be given to special problems concerned in power plant development by the Company for high operating temperatures, and to act as a consultant to the Company.

In 1949 he was elected a Fellow of the Royal Society. He has been a member of Council of the Institution of Mechanical Engineers for a number of years and in 1949 he was elected a vice-president.

I.B.F. "Edward Williams" Lecture

Properties of Materials and Engineering Uses of Cast Metals

By R. W. Bailey, D.Sc.(Eng)., Wh.Sc., M.I.Mech.E., F.R.S.

WHEN INVITED BY YOUR INSTITUTE to give this year's Edward Williams Lecture, an honour which I highly value, and was privileged to choose the subject, I welcomed the opportunity, and found no difficulty in selecting the title of the lecture. I felt that having during my life given considerable attention to the properties of metals from the standpoint of their engineering uses, and having had responsibility for their reliability both in cast and wrought forms, particularly in high-duty applications, a survey of the subject chosen in the light of changing views, circumstances, and trends would, I hoped, be of general interest, and might help to widen views and assist progress.

The choice of a material for any purpose whatever must of course be dependent in some measure upon the material's properties, including cost as a property, but for engineering uses the term properties has generally a restricted range, and usually refers to such qualities as strength, elasticity, ductility, ability to withstand repeated loading and shock, which would ensure reliability under operating conditions of loading and temperature. In addition there are such physical properties as density, thermal expansion, thermal conductivity, electrical resistance and magnetic properties any one of which may be of high, and in some circumstances of dominating importance, in specific cases. Even this restricted range of properties is clearly still a large one, but since most engineering structures have to be designed to transmit loads, strength would generally be given priority in importance, with ductility as a partner, but one of quite uncertain significance concerning the over-ruling requirement of reliability, and one which in my view is frequently over-valued as a property as distinct from the indication it may give of an abnormal and unsatisfactory condition. In view of the importance attached by engineers to strength and ductility attention is given first to these properties.

Question of Tensile Strength

The high importance attached to strength, (usually tensile strength is understood, since strength in compression would always be greater than in tension) is because more than any other property it determines the cross-sectional area of a part, whether the loading is static or variable. This is so in the latter case because the fatigue resistance bears a ratio to the tensile strength, termed the endurance ratio, commonly 0.4-0.5 for a wide range of metals. It is unusual however to base design directly upon fatigue-test data since failure in practice would depend so much upon other factors, such as the character of the disturbing forces, effects of notches and surface condition, and therefore experience with a particular kind of part in service is of much greater importance in determining permissible nominal variable stress. Consequently strength remains the dominant property.

Despite the information yielded by failures of parts in service, where frequently ductility has clearly played little or no part, most engineers have a feeling that ductility confers greater security. Therefore before considering engineering possibilities of cast metals from the standpoint of strength, it will be as well to enquire what measure of assured ductility is really useful in practice.

That the essential ductility must be quite small for most engineering uses, is evident if one considers the case of hardened gears, in say motor vehicles, which are subject to high loading of a repeated kind and heavy shocks at times, with stress concentration present, and where a tensile test would show not more than 1 per cent. extension including the elastic strain, which would constitute the greater part. A virtue assigned to ductility, or plastic strain, is that it accommodates stress concentrations and thus prevents the high stress values which would occur without plastic strain. But a stress of say 40 tons per sq. in. and a stress concentration factor of 3 bringing the unrelieved stress to 120 tons per sq. in., could have the difference between, say, 80 and 120 tons per sq. in. accommodated by an extension of $(40 \div 13{,}500) \times 100$, or by slightly under 0.3 per cent. It will be clear from this example that an assured ductility of 1 per cent. extension is likely to be adequate for safety in most engineering uses, but of course commonly more would be welcome, and would be essential in special cases, as for example lifting chains and gear. However, there is a considerable difference between small essential magnitudes, and those generally specified for wrought materials, which understandably tend to create a scale in the minds of engineers when considering castings.

Influence of Forging

Leaving out brass and bronze castings, which were often chosen for properties other than strength, the serious entry of castings as an alternative to wrought parts occurred with the production of steel castings, or the choice was between the same, or very similar materials, in the cast and wrought forms. In this connection the question naturally arises, what is the influence of forging? The answer from experience is, that given clean and

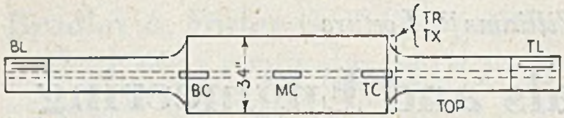

FIG. 1.—*Rotor Forging showing Test Positions. (See Table I.)*

sound material there is frequently little or no influence. The improvement often found with forging arises from its action in rendering a defective condition less harmful, though the condition may be in nowise an abnormal or remediable one. This may be exemplified by the case of a large rotor forging, where the reduction by forging on the body is 2.5:1 on cross sectional area and at each shaft end 20:1. The physical properties by tensile test, are given in Table 1, and shown by

TABLE I.—*Mechanical Properties of a Forging, Taken at Positions shown Fig. 1.*

	U.T.S., tons per in.sq.	Y.P., tons per in.sq.	Elongation, per cent.	R.A., per cent.
TL	45.6	25.5	20.0	39.2
TR	45.0	25.0	17.0	30.6
TX	45.8	26.0	18.0	24.6
BL	42.5	24.0	23.0	41.9
TC	47.5	25.5	18.0	36.4
MC	47.8	26.0	8.0	10.0
MC2 ..	41.5	23.5	6.0	11.7
BC	39.6	21.5	28.0	41.9

Fig. 1, where it will be seen that the properties at the axial position at the body, and at the shaft, are equally good for the end near the bottom of the original ingot. That a steel casting can give the properties of a high-class forging when the metal is clean, and segregation is negligible, is shown by the results of tests upon a large flywheel, cast in the usual sand mould. The results of tests

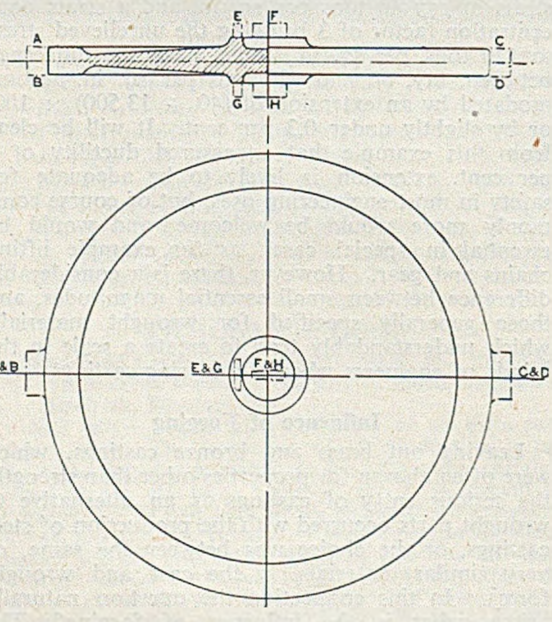

FIG. 2.—*Cast Steel Flywheel 12 ft. dia. showing positions of Test pieces. (See Table II.)*

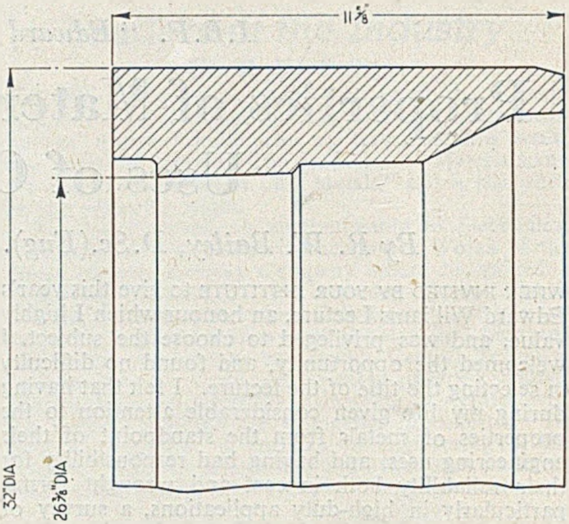

FIG. 3.—*Dimensions of a High-tensile Manganese/Aluminium/Brass Retaining Ring for a Single-phase Turbo-alternator. (See Table III.)*

are shown by Table II and are exhibited by Fig. 2. Experience in both cases shows that ductility is reduced by segregation, and that in the case of a forging, ductility may be improved by a sufficient reduction by forging.

TABLE II.—*Physical Test Figures for High Quality Cast Steel Flywheel.*

Test piece.	U.T.S., tons per sq. in.	Y.P., tons per sq. in.	Elongation, per cent.	Reduction of area, per cent.	Bend test.
A ..	37	22	27	45	180 deg. unbroken
B ..	36.5	22	27	46	180 deg. unbroken
C ..	37	22	25	36.4	180 deg. unbroken
D ..	36.5	22	29	48.8	180 deg. unbroken
E ..	37	23	27	50	60 deg. broken
F ..	37	23	26.5	50	180 deg. unbroken
G ..	37.25	23	28	50	180 deg. unbroken
H ..	37	22	17.5	30.8	180 deg. unbroken

Non-ferrous Retaining Rings

As an example of a high-duty non-ferrous casting, a high-tensile manganese/aluminium/brass retaining ring for a single-phase turbo-alternator may be cited. The dimensions of the ring are shown in Fig. 3, the chemical composition and tensile properties were as given in Table III.

Such rings have been superseded by non-magnetic steel forgings, warm worked to a tensile strength of 60 tons per sq. in. The few cases of failure in service of these non-ferrous castings were not due to any casting defects, but to intergranular

TABLE III.—*Composition and Mechanical Properties of a Manganese Aluminium Brass.*

	Cu.	Zn.	Fe.	Mn.	Al.
Per cent.	64.4	26.5	1.5	1.8	5.3

Y.P., tons per sq. in.	U.T.S., tons per sq. in.	Elongation, per cent. 4√A	R.A., per cent.
32.8	44.5	9	13

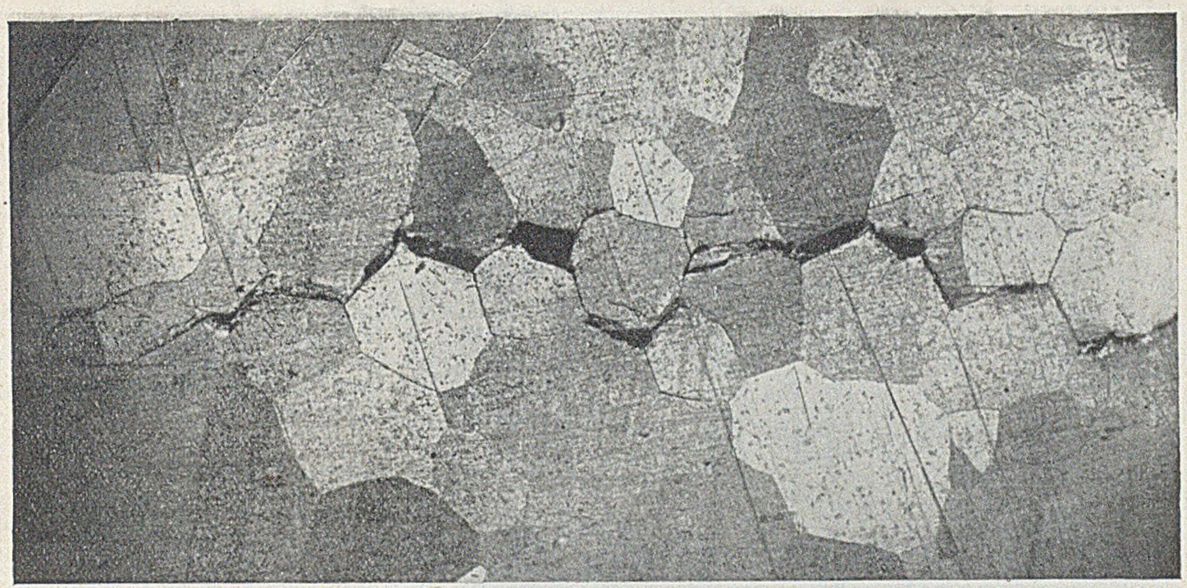

FIG. 4.—*Intergranular Crack in Cast Manganese/Aluminium/Brass Coil-binding Ring.* ×25.

cracking, of the "season cracking" type, the most serious in the lecturer's experience having been traced to the presence of ammonia in the atmosphere at the power station concerned, due to the proximity of a manure and fertiliser works. Fig. 4 is a photomicrograph showing a typical crack in this case. These examples will suffice to show that engineers have confidence in castings operating under severe conditions, provided the material has the requisite strength, cleanliness and assured ductility.

Castings at Elevated Temperatures

So far, working temperature has not been mentioned, and as tests are commonly made at atmospheric temperature, it is usual to think of material properties at this temperature. But of course there is a considerable field of usefulness for castings at elevated, and indeed quite high temperatures, where if they possess the necessary strength and reliability, they may not only offer an alternative to wrought material, but in some cases they may be constructionally and economically superior. The ability of metals to withstand loading in service at elevated temperatures is dependent upon the extent to which they undergo permanent deformation or creep, under load, and a very extensive field of special testing, as the reader will know, has come into existence during the last thiry years to determine the behaviour of metals in this respect. The phenomenon is not in itself very new and foundrymen have long been aware of one aspect of it in the distortion of castings and the use of a seasoning period or treatment to minimise its ill effects. Indeed, one of the great early pioneers in testing the properties of cast iron, E. Hodgkinson, who was responsible, according to general knowledge, for a well-known formula for the strength of cast-iron columns, and who also settled the cross-section proportions of cast-iron beams, must have been one of the first, perhaps the very first, to make creep tests. He measured the progressive shortening of a series of cast-iron columns under different loads, and their life to failure. The results of his tests were reported in the year 1840, and Fig. 5, reproduced from Hodgkinson's Royal Society Paper,[1] illustrates his tests. Now, vast numbers of tensile creep-testing machines are in use and are being added to all over the world, to meet high-temperature needs, but they are mainly applied to the testing of steels and heat-resisting alloys. Nevertheless, Hodgkinson's work on cast-iron pillars is historic, and I would quote his words. "In all the previous experiments, the pillars were broken without any regard to time, and an experiment seldom lasted longer than one to three hours. There might, therefore, be considerable doubt upon the minds of many persons whether the results obtained would be consistent with those which would arise from long continued pressure. At my suggestion, therefore, Mr. Fairbairn had the apparatus erected, by which pillars might be permanently loaded."

Two circumstances in our times which should have created a rational perspective regarding the significance of strength, microstructure and ductility of cast *vis-à-vis* wrought metals, are the behaviour of metals at elevated temperatures, and the advent and wide use of electric-arc welding. Both these developments violate earlier ideas of what appeared desirable, and what should be approved or disapproved. Together they provide a reasonable background against which properties and the engineering uses of cast metals may rationally be judged. Let us first notice the behaviour of metals at elevated temperatures.

At temperatures where creep operates, short-time tensile tests may show good strength with unimpaired ductility at fracture, but at lower stresses failure in a long time may occur at much reduced

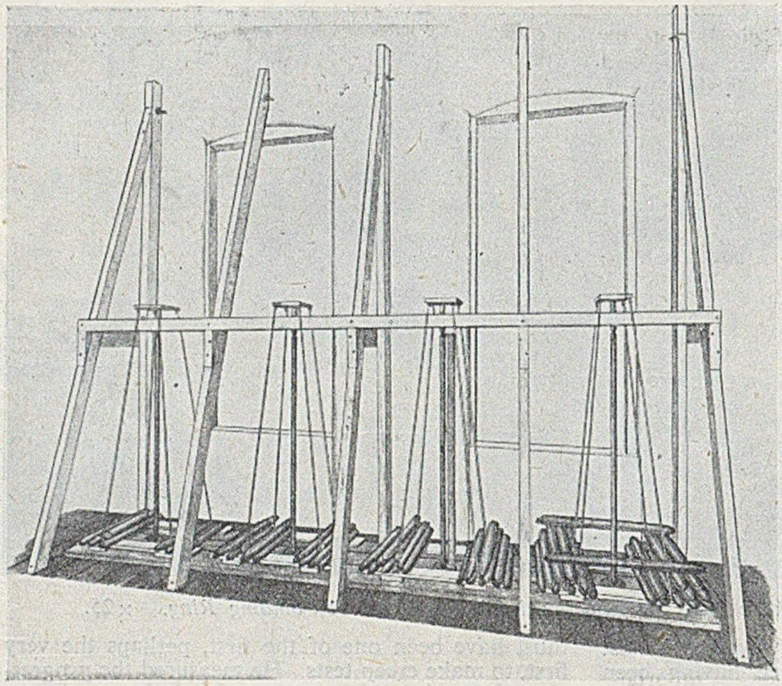

FIG. 5.—*Apparatus used by Hodgkinson for making Long-duration Creep Tests.*

ductility. This is particularly so in the case of materials of high resistance to creep, which would therefore be chosen for parts employed for strength at high temperatures. Low ductility in this case results from inter-crystalline cracking which supervenes before large deformation has developed. Commonly, the long-time ductility of the material used for high-temperature plant would not be more than a few per cent. extension. Safety against failure has to be provided by the margin this ductility has over that which takes place, and which by design is limited by the working stress. Fig. 6 shows characteristic intergranular cracking of a highly-creep-resistant steel under tension. Thus, wrought materials possessing high ductility as shown by the usual short-time tests may really operate under conditions causing the ductility at failure to be low and the normal ductility by short time test to have little or no practical significance when operation is considered. The position of cast metals for high-temperature service should therefore be judged from this more favourable standpoint.

FIG. 6.—*Charactertistic Intergranular Cracking of a 0.5 per cent. Molybdenum Steel under Tension at High Temperatures* × 10 *magnifications.*

A corresponding modification of views is to be expected from the widespread adoption of welded structures. Electric-arc welding has brought with it a wide range of microstructure and often residual stress which have now to be accepted, although many metallurgists of, say, two decades or so ago would have been greatly disturbed by their presence in structures of wrought materials. This must have compelled the conclusion in practical minds that microstructure, provided it does not reveal a dangerous feature, is in many cases of small importance in itself, and that it is upon effective physical properties that the suitability of a metal part rationally depends, and it should be judged upon this basis. Hence the high importance of properties of materials in assessing engineering uses of cast metals.

Cast Crankshaft

An outstanding example showing a full appreciation of the importance of material properties in influencing the engineering use of a cast metal, is furnished by the work done to improve the strength and ductility of cast iron, and particularly in investigating the use of cast iron for crankshafts of internal combustion engines. Members of this Institute will be closely familiar with this important work through the valuable contributions made by the British Cast Iron Research Association, through papers contributed to the Institute, to a less extent perhaps through the admirable work carried on by the Motor Industries Research Association, and lastly through personal direct experience. But this work must also have important lessons for engineers, because of its general usefulness in throwing light upon what properties are essential and what are inessential to security.

Crankshafts have rightly been regarded as a vital component of engines, subject as they are to high loading of a repeated or cyclical character producing torsional and bending stresses, associated frequently with forced and sometimes synchronous vibration of both kinds. The essential form of the part involves regions of high local stress which can only be mitigated but not removed by skilful design and generous fillets, and good resistance to wear at journals is important. Material properties of a high order, such as strength, ductility, surface hardness, notch-bar value, notch insensitivity and fatigue resistance were looked for in forged-steel shafts, and by many engineers they were regarded as essential. But clearly the successful operation of cast-iron crankshafts has assisted in creating a more reliable perspective regarding the significance of these properties, and this has been made more precise by the extensive investigation of the materials used.

Fatigue

Next to strength and ductility, or more widely the ability of a material to deform safely in service, the ability of a component to withstand repeated, fluctuating, and reversing stresses is a property of great practical value. It is embraced generally by the term fatigue, and a vast amount of fatigue test-

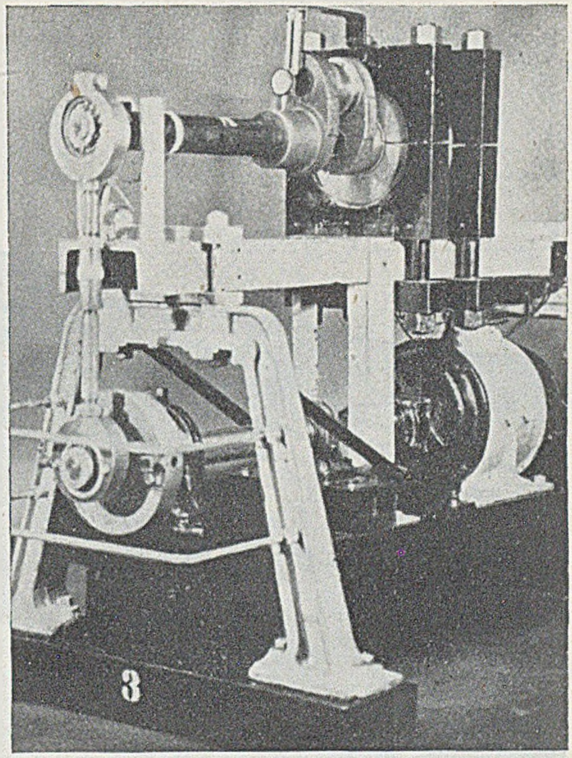

FIG. 7.—*Fatigue Testing Machine for Testing Crank Webs and Pins in Bending.*

ing of metals has been carried out over the years, of which only a small part can be said to have had much influence upon the choice and use of materials. This is because test-pieces frequently are not strictly representative of actual parts in the material, surface condition or scale, but are employed to measure or investigate a material property which has usefulness for comparative purposes, but is rarely a basic factor in design, although it may influence practice in manufacture, as for example the use of a surface treatment to increase resistance to fatigue failure. Parts should not normally fail by fatigue, but they do at times, and most frequently the cause is stress arising from vibration at a critical or natural frequency, faulty design producing high stress concentration, or the presence of a defect, or defective surface condition—a case may be cited where fatigue failure of a steel shaft resulted from an electrode welder touching the shaft with his live electrode. Change in design is usually the only satisfactory remedy, and as this is generally possible, it is the course commonly followed. Almost always a material is chosen for some property other than its specific resistance to fatigue.

In connection with fatigue, the subject of the internal damping capacity of a material or its property of absorbing energy—as by internal friction—under cyclic stress, is continually cropping up. Damping capacity has considerable scientific interest and value in the physics of metals, but because its

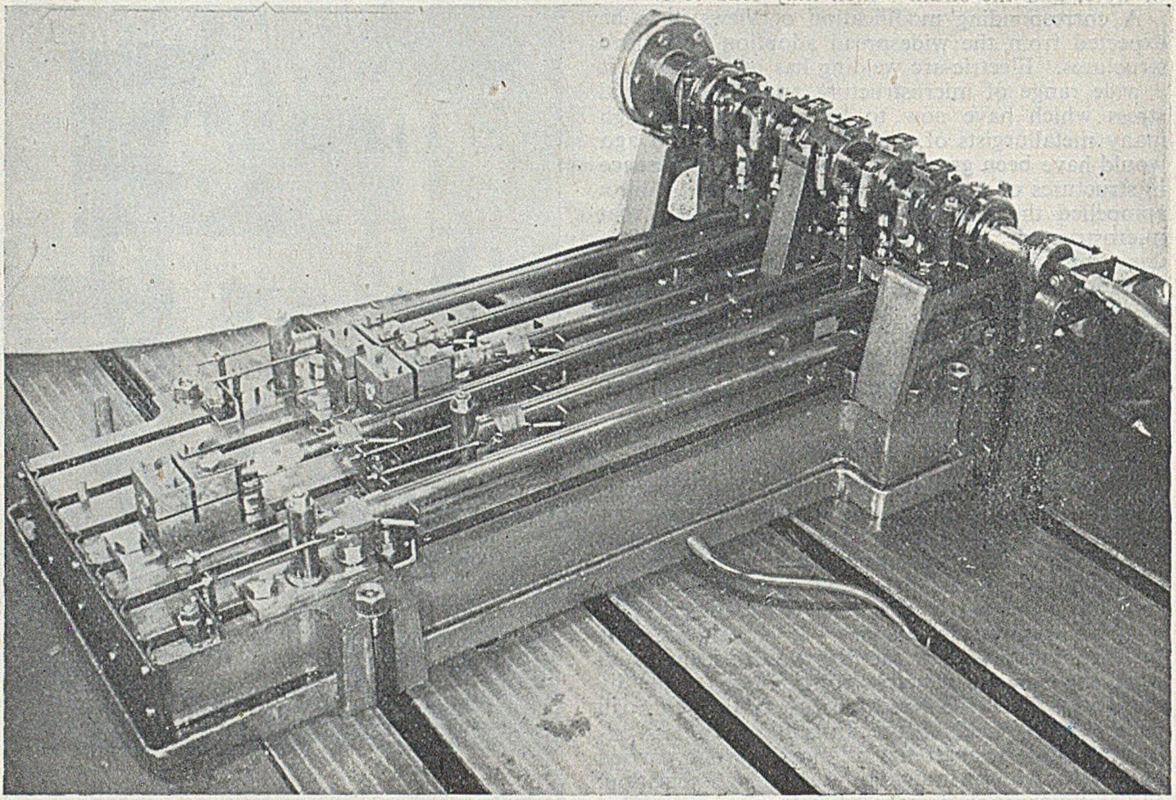

FIG. 8.—*Metropolitan-Vickers Cantilever-type Mechanically-operated Repeated-strain Testing Machine.*

amount is usually small compared with that contributed by constructional and operational features of machines and machine parts, it has very little influence in engineering practice, and none in my experience in determining the choice of a material for a particular part.

It should not be assumed from these remarks upon the fatigue resistance of a material, that fatigue is a property of little importance. Fatigue testing becomes of very considerable practical importance when it is applied to actual parts, and therefore when it makes an approach to the conditions which occur in engineering practice. Here the factors of material, surface condition, design, and perhaps the character of the loading are present, and the test becomes an endurance test under the special conditions determined by these factors in association. Strain-gauge technique may in some cases be utilised to enable actual stresses to be measured, but usually the intensity of the loading can be represented by a nominal calculated stress, which can be utilised for design.

An extremely useful type of fatigue-testing machine is one in which a movement of controllable amount can be imposed upon the part under test, to determine the loading. A valuable feature of the type is that it imposes a specific strain, as distinct from a specific load or stress. Frequently such machines are simple and readily constructed. A good example of this type of machine has been applied by the Motor Industry Research Association[2] for investigating cast-iron crankshafts. Fig. 7 illustrates the equipment and shows a single-throw crank of standard form used for the tests, which is tested stationary in the position shown. The crankshaft at the remote side of the crank is held firmly by a clamp, and the shaft at the opposite side has a shaft extension whose end is displaced up and down subjecting the crank webs and pin to bending. The movement is applied by the vertical rod shown, being derived from an adjustable eccentric mounted on the driving shaft below the crankshaft. By means of loading by weights, and the measurement of strain at some position of the part, calibration can be effected. Fig. 8 shows a battery of six cantilever mechanically-operated repeated-strain testing units employed by the lecturer's company, where the displacement and loading applied by each machine is derived from an eccentric of fixed eccentricity, and the load and displacement are varied by altering the length and flexibility of the cantilever. Thereby the bending moment it transmits to the part or material under test is determined.

The lecturer has made reference to the applied-strain type of machine because cast metals can often best be judged in comparison with wrought metal for engineering parts by tests of this kind when fatigue or repeated strain is the criterion. This is because frequently failure, if it occurs, will take place where there is a gradient of stress and strain, as at a fillet or hole, and the strain which may lead to failure is likely to be partly plastic and partly elastic, and the accompanying stress will be determined by the stress/strain characteristics of the material, which will be different with different materials. A shaft rotating in three bearings with a specific misalignment would be a case of applied strain.

Many parts which appear to fail by fatigue, do so not under millions of applications of stress, as in the common fatigue test, but under a comparatively small number of applications of excessive strain. It is the large pot-holes and heavy bumps which most damage a road-vehicle spring. The ordinary fatigue test and fatigue test results throw little useful light upon the important property of a material to withstand repeated heavy strain without developing a crack. This property is best investigated by the applied-strain type of machine. A cast material having good behaviour in this respect would have substantial claims for use as an engineering material. A measure of ductility is clearly needed, but it should be ductility which allows a large number of cycles of strain to be withstood safely—a descriptive but inelegant word for this property would be "concertina" ductility.

Spheroidal-graphite Cast Iron

The recent improvements of cast irons resulting in a measure of ductility and much improved strength, notably by causing the graphite to be spheroidal, may also have conferred the property of withstanding repeated high strain. If so, this would be an important gain and would increase the engineering value of the material.

Another direction in which one may expect cast iron having spheroidal graphite to offer interesting possibilities is in applications to parts operating at high temperatures under stress as in steam power plant. Hitherto the use of flake-graphite cast iron

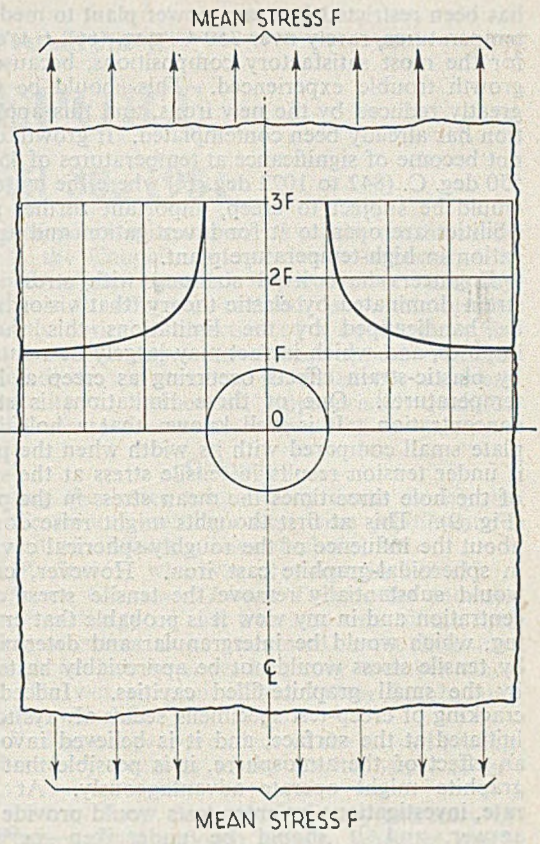

FIG. 9.—*Concentration of Stress at a Hole in a Plate under Tension.*

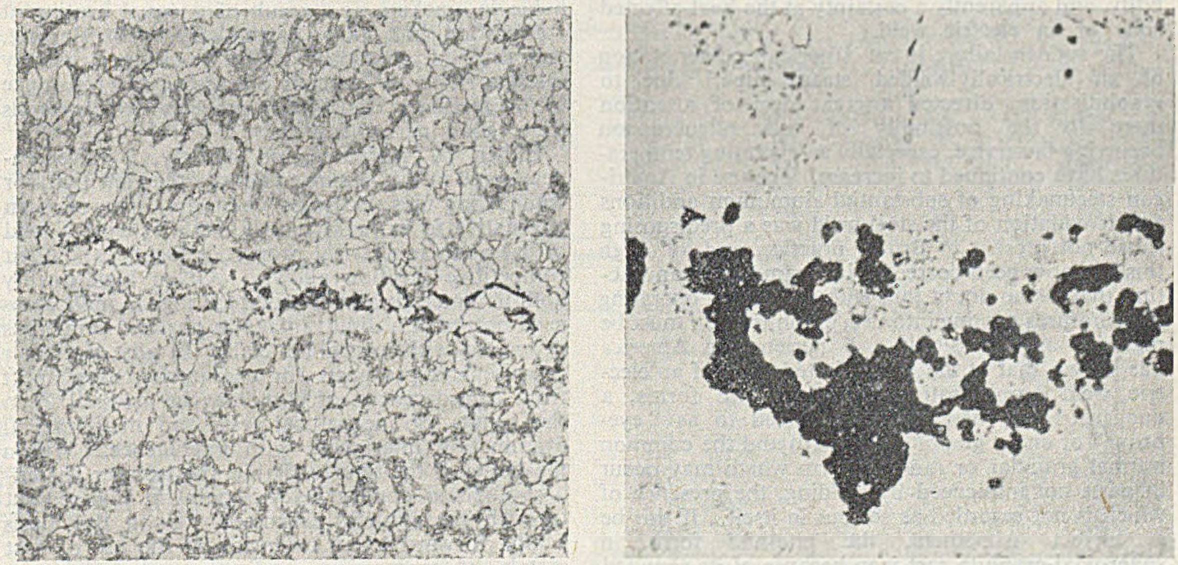

FIG. 10.—*Photomicrographs showing Chain Graphite at the Heat-affected Zone of an Electrically-welded Steam Pipe. On the left* × 100, *and on the right* × 1000

has been restricted in steam power plant to medium temperatures, rarely over 350 C. deg. (662 F.), even for the most satisfactory compositions, because of growth trouble experienced. This should be very greatly reduced by the new irons, and this application has already been contemplated. If growth does not become of significance at temperatures of 450 to 550 deg. C. (842 to 1022 deg. F.) where the material would be subject to creep, important further possibilities are open to it for investigation and application in high-temperature plant.

Engineers have lived so long with stress and strain dominated by elastic theory, that vision may be handicapped by the limitations this theory imposes, and which in fact may largely be removed by plastic-strain effects occurring as creep at high temperatures. One of these limitations is stress concentration. It is well known that a hole in a plate small compared with its width when the plate is under tension results in tensile stress at the sides of the hole three times the mean stress in the plate (Fig. 9). This at first thoughts might raise doubts about the influence of the roughly-spherical cavities in spheroidal-graphite cast iron. However, creep would substantially remove the tensile stress concentration and in my view it is probable that cracking, which would be intergranular and determined by tensile stress would not be appreciably hastened by the small graphite-filled cavities. Indeed as cracking of creep-test specimens seems always to be initiated at the surface, and it is believed involves an effect of the atmosphere, it is possible that the graphite might operate advantageously. At any rate, investigations by creep tests would provide the answer, and it should be undertaken—perhaps interested individuals are doing this or may have done so. However this may be, operating temperatures have now reached a level such that the long operating life expected of steam power plant has made graphitisation of wrought steels a possibility, and apparently a certainty at the heat-affected zone of an electric weld.

The sudden failure in an American power station of an electrically-welded steam pipe,[3] due to graphitisation, directed a great deal of attention there to the possibility of this phenomenon occurring in service, especially as operating temperatures have continued to increase. The use in American steelmaking of substantial aluminium additions for deoxidation of the steel weld was a predisposing cause not present in British practice, and although this has now been corrected in steam-pipe manufacture there is no doubt that with the higher operating temperatures coming into use, graphitisation must be regarded as a possibility. Experience in America has shown that at the heat-affected zone of an electric weld graphitisation may take two forms, a dangerous one descriptively referred to as "eyebrow" or chain graphite[1] (Fig. 10) and the common normal granular or random form which may occur in parts not influenced by welding, the presence of which is not regarded as serious in itself. If this be a correct assessment, the graphite form in spheroidal-graphite cast iron because of its rounded character, should be even less of a risk. One may expect, however, that as a steel may graphitise because of its long life at a high operating temperature, a cast-iron having spheroidal graphite as cast, because of the great activity conferred by the accelerating element used, e.g., cerium, or magnesium, would undergo considerable changes as a result of similar operating conditions, and it would be a matter for investigation to determine what these changes might be, and their effect upon physical properties.

It is a circumstance of considerable interest that the development of wrought ferritic steels for high-temperature service, and the improvement of cast irons stimulated by the need for improved tensile strength and ductility should have resulted in materials which under advanced operating conditions promise comparable ductility, may be graphitic, and may not be widely different in their physical properties at operating temperature. There seem to be good grounds for hope from recent developments that the range of usefulness of cast iron for high-temperature steam plant may be increased. This would no doubt be welcomed by iron foundries already producing castings for the lower range of temperatures.

Lost-wax Process

For very high operating temperatures which gas-turbine development has necessitated, it is recognised that superior alloys may be impracticable in wrought form or may present production difficulties which would be avoided by castings, and it is because of this possibility, that particular interest has been taken in the "lost wax" process of precision casting, and it accounts largely for its most common application to the production of gas-turbine blades. Cast blades have proved satisfactory for the stationary guide vanes, but the need has not yet arisen for their use as moving blades, where operating stress is more severe. Experience has shown that stationary blades of jet-aircraft gas-turbines are liable to cracking as a result of unequal heating at combustion hot spots, particularly when starting, and that the character of the cracking is usually intergranular. Materials are tested for resistance to this tendency, and in this property cast materials show good performance.

Either by inference, or directly, I have endeavoured in this lecture to convey the view that, for engineering uses, castings, where they may offer an alternative to wrought metals, have as wide a field of use as their physical properties justify, and their competitive position allows. Given high quality both in materials and product, castings in most cases need not be at a disadvantage in physical properties compared with wrought metals. In any case their promise and prospects for engineering uses, apart from considerations of cost, may be assessed upon the results of mechanical tests and metallurgical examination interpreted with intelligence. Within the limits of the time available, the lecturer has endeavoured to convey his viewpoint in this respect through the subjects discussed. Upon this basis I look forward to an extension of the use of cast metals in engineering application, commensurate with their material properties of essential character.

(*Continued on page* 641, *column* 2)

Institute of British Foundrymen

ANNUAL REPORT

May 1, 1950, to April 30, 1951

The report of the work carried out by the Institute of British Foundrymen during the twelve months ended April 30, 1951, records a period of very satisfactory progress. Accompanying the report are the Income and Expenditure Account for the year ended December 31, 1950, and the Balance Sheet as at that date. What follows is a slightly abridged version of the Report:—

Finance

The special resolution amending Bye-Law 9, passed at the Annual General Meeting held at Buxton on June 7, 1950, was approved by the Privy Council, and the increased rates of subscriptions became effective on January 1, 1951. As the accompanying income and expenditure account covers the year ended December 31, 1950, it does not reflect the improvement in the Institute's resources which should accrue from these higher subscription rates during the present year.

Membership

Tables I and II show the aggregate membership at April 30, 1951, to be 4,773. The corresponding figure at the same date last year was 4,588. A measure of satisfaction is afforded by this increase in the Institute's membership, but it is the view of the Council that the influx of new members is far below the highest rate which could be achieved. The advantages of membership are brought to the notice of potential members by all the means available to the Council, but particular importance is attached to the personal approach, as being by far the most effective method of attaining the eminently desirable objective of a substantially increased membership. An earnest appeal is therefore made to all members to endeavour at every opportunity to induce all appropriately-qualified foundrymen to become associated with the Institute.

Obituary

Among the losses sustained by death during the year are several members who were prominent in the Institute's affairs. These include:

R. W. Stubbs, who was president in 1934-35.

Professor Emeritus Thomas Turner, the founder of the metallurgy of cast iron and one of the first eminent scientists to be interested in the Institute, of which he had been an honorary member since 1910. He was recipient of the Oliver Stubbs and E. J. Fox Medals.

A. V. Biggs, a past-president of the Bristol branch and honorary treasurer of the Cheltenham Conference.

J. J. McClelland, formerly honorary secretary of the Wales and Monmouth branch, who did much for the Institute's work, in South Wales and in the West of England.

G. W. Brown, a past-president and active member of the Birmingham branch.

F. H. Hurren, who had given many papers to the

TABLE I.—*Changes in Membership,* 1950-1951.

	Subscribing firms.	Members.	Associate members.	Associates.	Totals.
At April 30, 1950	224	1,698	2,155	511	4,588
Additions and transfers from other grades ..	11	146	183	135	475
	235	1,844	2,338	646	5,063
Losses and transfers to other grades	8	71	189	22	290
At April 30, 1951	227	1,773	2,149	624	4,773

TABLE II.—*Analysis of Membership at April 30,* 1951.

Branch.	Subscribing firms.		Members.		Associate members.		Associates.		Totals.	
Birmingham	21	(20)	269	(247)	315	(315)	129	(95)	734	(677)
Bristol	5	(6)	74	(82)	69	(66)	8	(7)	156	(161)
East Midlands	9	(8)	95	(89)	188	(192)	48	(36)	340	(325)
Lancashire	34	(32)	212	(196)	317	(313)	64	(48)	627	(589)
Lincolnshire	1	(1)	19	(19)	58	(54)	11	(9)	89	(83)
London	29	(33)	391	(362)	284	(288)	53	(33)	757	(716)
Middlesbrough	2	(2)	47	(41)	79	(82)	63	(68)	191	(193)
Newcastle	23	(20)	48	(45)	79	(83)	69	(63)	219	(211)
Scottish	25	(23)	169	(164)	248	(277)	61	(61)	503	(525)
Sheffield	9	(8)	115	(114)	105	(99)	13	(13)	242	(234)
Wales and Monmouth ..	6	(6)	60	(63)	77	(65)	27	(25)	170	(159)
W.R. of Yorks	11	(12)	94	(94)	175	(180)	35	(22)	315	(308)
South African	45	(47)	106	(110)	106	(102)	27	(22)	284	(281)
General	7	(6)	74	(72)	49	(39)	16	(9)	146	(126)
TOTALS	227	(224)	1,773	(1,698)	2,149	(2,155)	624	(511)	4,773	(4,588)

Figures in brackets are totals at April 30, 1950.

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Institute in the past, and who was well-known in the Midlands.

G. D. Lawrence, of London, who was well-known in technical college circles.

T. R. Walker, who had completed over 23 years as secretary of the Sheffield branch.

C. T. Monseur, of Liége, a member of the London branch.

The complete list of members who have passed away during the year is as follows:—

Name.	Grade.	Branch.	Date Joined.
J. Adderley	A.M.	Lancashire	1943
W. Auckland	A.M.	Lancashire	1930
J. C. R. Baker	A.M.	Bristol & W.E.	1945
J. G. Bell	M.	Scottish	1949
A. V. Biggs	M.	Bristol & W.E.	1936
G. E. Booth	A.M.	W.R.Y.	1922
G. W. Brown	M.	Birmingham	1931
E. A. Carlisle	M.	London	1937
R. W. Cuthill	A.M.	Scottish	1948
T. W. Duthie	M.	Scottish	1942
J. W. Etchells	A.M.	Lancashire	1938
G. S. Graham	M.	South Africa	1944
S. Holding	A.M.	Lancashire	1946
J. M. Hood	M.	Scottish	1914
F. H. Hurren	M.	Birmingham	1907
J. P. Ibbotson	M.	Sheffield	1937
G. D. Lawrence	M.	London	1921
W. G. Maw	M.	Bristol & W.E.	1945
J. J. McClelland	M.	Wales and Mon.	1922
J. A. MacKinlay	M.	London	1939
C. T. Monseur	M.	London	1933
N. P. Partlow	A.	Birmingham	1946
W. J. Petersen	M.	South Africa	1938
H. Reeve	A.M.	East Midlands	1933
H. S. Rooke	M.	London	1931
W. H. Smith	A.M.	Lancashire	1937
Wm. Stead	M.	Lancashire	1932
R. W. Stubbs	M.	Lancashire	1919
P. G. Thompson	A.	London	1946
Prof. Thomas Turner	M.	Birmingham	1910
T. R. Walker, M.A.	M.	Sheffield	1918
J. Wasteney	A.M.	Sheffield	1911
W. H. Wright	M.	East Midlands	1928

Honours Conferred upon Members

The Council congratulates the following members who have been honoured during the year:—

J. D. Carmichael, O.B.E., M.I.Mech.E. (member), past president of the Newcastle branch of the Institute, has been appointed a Justice of the Peace for the borough of South Shields.

Ambrose Firth (member) past president of the Sheffield branch, has been appointed a Justice of the Peace for the city of Sheffield and has been elected president of the Sheffield and District Engineering Trades Employers' Association.

J. W. Gardom (past president) has been elected president of the National Trades Technical Society.

R. L. Handley (member) has been elected chairman of the information committee of the British Cast Iron Research Association.

Dr. J. E. Hurst (past president) and immediate past president of the National Trades Technical Society, has been elected a permanent member of the national executive committee of that body.

Sir Andrew McCance, D.Sc., LL.D., F.R.S. (member), has been elected president of the British Iron and Steel Research Association and of the Institution of Engineers and Shipbuilders in Scotland.

A. E. Peace (member) has been re-elected chairman of the research board of the British Cast Iron Research Association.

Professor A. Portevin (honorary member) has been promoted to the grade of Commander of the Order of Leopold.

John J. Sheehan (president) has been elected chairman of council of the British Cast Iron Research Association. He has also been elected chairman of the Association's Development Committee.

R. C. Shepherd (member) has been elected president of the North Midlands branch of the Ironfounders' National Confederation.

Oliver Smalley, O.B.E. (member) received the Gold Medal of the Gray Ironfounders' Society of America.

A. W. W. Taylor (member) has been appointed an officer of the Order of the British Empire. Mr. Taylor is vice-president of the West Wales section of the Wales and Monmouth branch of the Institute.

W. G. Thornton (past president of the West Riding of Yorkshire branch) received a presentation from the members of the West Riding Ironfounders' Association, as a mark of their appreciation for his two years' service as president of the Association.

P. H. Wilson, O.B.E. (past president) has been admitted to the Venerable Order of the Hospital of St. John of Jerusalem as a serving brother.

Awards

The following awards were presented at the Annual General Meeting held at Buxton, in June, 1950:—

Oliver Stubbs Medal.—To Mr. John Arnott, F.R.I.C. in recognition of his outstanding services to the Institute by his work in presenting several valuable papers of a particularly high standard and by his active participation in the work of the technical council and technical committees.

E. J. Fox Medal.—To Mr. S. H. Russell (past president) in recognition of the great contributions he has made in the technical educational, research organisation and administrative fields of the industry over a long period of service.

British Foundry Medal.—To Mr. A. R. Martin, B.Sc., A.R.S.M., for his paper "Some Notable Aluminium Alloy Castings," which was published in volume XLII of the Proceedings.

Meritorious Services Medals.—To Mr. T. R. Walker, M.A. (Cantab.) and Mr. A. S. Wall for the outstanding services which they have rendered to the Institute as honorary secretaries respectively of the Sheffield and Wales Monmouth branches.

Diplomas.—Diplomas were awarded to the following members for papers presented at the branches named below:—

Mr. L. W. Bolton, London branch.
Mr. J. Caven, Birmingham branch and Slough section.
Mr. H. W. Keeble, Birmingham branch and Slough section.
Mr. E. S. Renshaw, London branch.
Mr. A. Talbot, London and Bristol branches.
Mr. W. Wilson, London and Bristol branches.

Edward Williams Lecture

The Edward Williams Lecture for 1950 was delivered at the Annual General Meeting at Buxton, on June 7, 1950, by Sir Andrew McCance, D.Sc., LL.D., F.R.S., the title being "Gases and Steel."

The 1951 Edward Williams Lecture will be delivered at the Newcastle Conference by R. W. Bailey, D.Sc., F.R.S., whose subject will be "The Properties of Materials and the Engineering Uses of Cast Metals."*

Branch Activities

The special thanks of the Council and members must again be expressed to the branch presidents, branch secretaries and other branch officials, for their enthusiastic work which has resulted in a year of branch activity unsurpassed in usefulness and interest. Particular reference may perhaps be made to the Scottish branch who have held special meetings in the Dundee and Arbroath areas, and to the Lancashire branch, whose officers have arranged, in addition to the normal programme, special meetings in outlying towns in the branch area. By this means it is hoped to enlist the interest of foundrymen whose hesitation to become associated with the Institute is based on the difficulty of attending meetings. As a result of this work the Council, at its April meeting, authorised the formation of a North East section of the Scottish branch.

The Council was specially pleased to welcome on a visit to this country Mr. H. Godwin, junior vice-president of the South African branch. Mr. Godwin was able to be present at the Buxton Conference and was in close touch with officials of the Institute during the several months of his stay in the United Kingdom. As a result of consultation with Mr. Godwin several measures having the object of overcoming difficulties inherent in the great distance which separate the South African branch from the central organisation have been approved, and the Council is confident that the manifest goodwill and desire for the closest co-operation will find even fuller expression in the future.

National Works Visits Day

Organised by the Birmingham branch, the first National Works Visits Day was held at Birmingham on Friday, October 6, some 211 members participating in eight groups of visits to foundries in the area. Intended to supplement the arrangements which are already made by the branches and at the Annual Conference, these visits provide an opportunity to take part in an annual national gathering for those members who cannot spare the time to attend the whole of the Annual Conference.

The thanks of the Council are due to Mr. R. B. Templeton (past-president) who fostered the scheme. and to Mr. E. R. Dunning, the Birmingham branch secretary, for the efficient manner in which he dicharged the duty of organising the arrangements.

The 1951 National Works Visits Day will be held on Friday, October 12. On this occasion the London branch will be responsible for the arrangements.

Technical Development and Education

From the funds raised by the pig-iron levy, the Joint Iron Council has maintained the grant to the Institute in reimbursement of expenditure incurred in expanding the Institute's work in the field of technical development and education. These funds have been most usefully employed in such projects as a further foundry foremen's training course, an additional grant to a selected student for studying purposes, the publication of a number of special reports, a revised edition of the lecture notes in foundry practice, and the provision of additional facilities for the work of the Technical Council and its Sub-committees.

It is highly gratifying to the Council that, without exception, these several ventures intended to advance the aims of the J.I.C. grant have been conspicuously successful.

Educational Activities

Publication of the new and revised edition of the specimen notes for teachers entitled "Lectures in Foundry Practice" based on the Foundry Practice Intermediate Examination syllabus of the City and Guilds of London Institute foreshadowed in last year's report took place in March. Work on the corresponding lecture notes for the final examination is now proceeding.

The Institute's active participation in the management of the City and Guilds of London Institute examination in Foundry Practice and Patternmaking, which it was instrumental in establishing some years ago, has been maintained during the past twelve months. The results of the 1950 examinations which are recorded below indicate that the examinations continue to meet the needs of an increasing number of students.

	Number of candidates.	Pass 1st Class.	Pass 2nd Class.
Patternmaking—Intermediate.	313	70	136
Patternmaking—Final.	83	20	41
Foundry Practice—Intermediate.	232	40	118
Foundry Practice—Final.	62	6	27

The Institute has been associated with the awards of the following prizes in connection with the examinations:—

Foundry Practice: Final Grade.—Buchanan Medal to R. Lindsay of Brighouse; a Buchanan Prize to D. Lane of Sheffield.

Patternmaking: Final Grade.—Buchanan Medal

* Printed elsewhere in this issue.

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to G. F. Aston, of Cradley; a Buchanan Prize to F. J. C. Pearson, of Coventry.

Foundry Practice: Intermediate Grade.—P. H. Wilson Prizes to F. J. C. Pearson, of Coventry (first prize) and D. F. J. Thurkettle, of Ipswich (second prize).

Patternmaking: Intermediate Grade.—P. H. Wilson Prizes to R. D. Line, of Rugby (first prize) and I. McGillivray, of Dundee (second prize).

Publications

Serious delay, arising from the London printers strike and ban on overtime, prevented the issue of volume XLIII of the *Proceedings* until the late spring of 1951.

Preprints of Papers presented at the Buxton Conference were made available without charge to all members on request. In addition, the following publications have been issued during the past twelve months:—

Vol. XLIII of *Proceedings*.

Journal of the Institute, which has been published at two-monthly intervals.

Lecture notes entitled: "*Lectures in Foundry Practice.*"

Final report of Sub-committee T.S. 23 on: "*The Repair and Reclamation of Grey Iron Castings by Welding and Allied Methods.*"

Final report of Sub-committee T.S. 26 on: "*The Repair and Reclamation of Non-ferrous Castings.*"

The second impression of the "*Atlas of Defects in Castings*" continues to sell at a satisfactory rate. Sales of this exceedingly successful publication now total 2,300 copies.

Foundry Foremen's Training Course

An overflow of applications for the foundry foremen's training course, held at Ashorne Hill, Leamington Spa, from March 8 to 10, 1951, confirmed the Council's view that the usefulness of this comparatively new activity of the Institute is far from exhausted.

Visitors numbering 218 attended the entirely fresh series of lectures forming the course, which has clearly become one of the most valuable developments to which funds from the J.I.C. grant have been applied.

The Council takes this opportunity to acknowledge its indebtedness to the many past-presidents who, in support of the president and vice-presidents, accepted exacting duties, involving a great sacrifice of working time and leisure, to ensure the success of the course.

Students' Grant

In view of the successful outcome of the Council's decision in 1949 to make an award from the funds available from the Joint Iron Council's grant to assist the studies of a suitably-qualified young foundryman, a further grant was announced for award during the past year.

A large number of applications was again received and as a result of the adjudication of the panel of assessors, consisting of Mr. L. W. Bolton, Dr. A. B. Everest, Mr. A. S. Worcester and Mr. G. L. Harbach, the award was made to Mr. R. K. Jackson, of Great Harwood. Mr. Jackson chose to use the grant to enable him to take a course at the National Foundry College at Wolverhampton and he commenced his studies there in September. The Council are pleased to announce that Mr. Brinley Edwards, who received the first grant, was awarded a scholarship which has enabled him to spend a further year at the National Foundry College. The Council proposes to offer yet another grant for award in 1951.

International Co-operation

The Council are pleased to record that Mr. N. P. Newman, J.P., during his presidency of the Institute, attended the Annual Congress of the American Foundrymen's Society at Cleveland from May 8 to 12, 1950, as the Institute's official delegate. The most cordial relations continue to be maintained with the American Foundrymen's Society and with the various Continental associations. An official exchange of Papers has again been effected with several overseas associations.

The meetings of the International Committee of Foundry Technical Associations were held immediately preceding the Institute's Annual Conference at Buxton in June. The overseas delegates represented some 10 countries, and most of them remained to take part in the Institute's Conference which followed. They were entertained to dinner by the Council at the Palace Hotel, Buxton, on the evening of Monday, June 6.

Relations with other Organisations

During the past year the Institute has co-operated with a large number of outside organisations, including the Joint Committee on Metallurgical Education, the Committees administering the Mond Nickel Fellowship and many technical committees of the British Standards Institution. As will be noted from the report of the Technical Council,* co-operation on technical matters has also been fostered with the British Cast Iron Research Association, the British Steel Founders' Association, the British Non-Ferrous Metals Research Association, and the Association of Bronze and Brass Founders.

Annual Golf Meeting

At the Annual Golf Meeting of the Institute, held at Woodhall Spa, Lincs, on September 23 to 24, forty-four members and ladies were present, twenty-eight members actually participating in the play. The arrangements were made by Mr. F. Arnold Wilson, honorary secretary of the I.B.F. Golfing Society formed in 1949. Mr. R. B. Templeton (past-president) has been re-elected president of the Society.

Australian Food Parcels

Maintaining a generous practice established some four years ago, the members of the Victorian

* Shortly to be printed in the JOURNAL.

division of the Institute of Australian Foundrymen have sent a large number of food parcels during the past twelve months for distribution to members of the Institute in this country. These parcels were distributed on a branch basis. The Council is assured that all members will associate themselves in expressing warm appreciation of the sustained generosity of our Australian confreres.

Council and Committees

Four meetings of the Council, four meetings of the Technical Council, and numerous meetings of the Executive and other standing committees and of the Sub-committees of the Technical Council have been held during the past twelve months.

The arrangement whereby representatives of the British Cast Iron Research Association and the British Non-Ferrous Metals Research Association are co-opted as members of the Council has been extended during the past year to include the British Steel Founders' Association, who have appointed Mr. J. F. B. Jackson to serve in this capacity.

Of the members of the Council elected by ballot for two-year periods, five retire each year by rotation. Those who so retire at the Annual General Meeting in 1951 are:— Mr. L. W. Bolton, Mr. E. Longden, Mr. J. H. Pearce, Mr. P. A. Russell, B.Sc. and Mr. H. J. Young.

The Council takes this opportunity of paying tribute to the many members who have actively participated in the work of the Institute during the past year and who have thus made contributions to the steady progress which has been maintained. In particular the work of the honorary treasurer, Mr. C. W. Bigg, and of the chairman and vice-chairman of the Technical Council, Mr. A. E. Peace and Mr. L. W. Bolton respectively, calls for special mention.

At the Annual General Meeting to be held at Newcastle-on-Tyne on June 11, the Council will nominate the following officers for the year 1951/52:—

As president: Mr. Colin Gresty.
As senior vice-president: Dr. Cyril J. Dadswell, B.Sc.
As junior vice-president: Mr. E. Longden.

1950 Annual Conference

The Council wishes to express special appreciation of the work of the Conference Committee, the Conference treasurer and all others who were responsible for the arrangements for the highly-successful Conference held at Buxton in June, 1950. The 48th Annual Conference will be held at Newcastle-on-Tyne from June 10 to 13, inclusive and is organised by the Newcastle branch.

The report is signed by:

MR. JOHN J. SHEEHAN, *president*.
MR. T. MAKEMSON, *secretary*.

ACCORDING TO PROVISIONAL ESTIMATES, Italian production of crude steel in February amounted to 213,000 tons (183,500 tons of rolled steel) and of pig-iron to 46,100 tons. Compared with the corresponding two months of 1950, production of steel in January and February of this year increased by 21 per cent. and that of pig-iron by 17 per cent.

Luxemburg Steel Output

Luxemburg's steel production was higher in January and March than in any month of 1950. February output was lower because of fewer working days in that month. Steel output in the first three months of this year was as follows, pig-iron production figures being given in parentheses:—January, 246,013 (247,659) tons; February, 241,518 (237,788) tons; March, 256,856 (260,713) tons.

The steel industry, it is reported, is still grappling with the problem of obtaining raw materials, particularly coke. Internal B.L.E.U. prices have remained stable since November, 1950, and have been fixed at 3,750 fcs. a ton. Export prices have risen and are now 7,500 fcs. a ton for B.L.E.U. steel.

The mining industry has not been in a particularly healthy state and the production index figure was going down. The present monthly production, however, is greater than the average figure for 1950. Belgium and Germany are traditionally the chief clients of Luxemburg, but, since February, Germany has ceased all mineral imports from the Grand Duchy and Belgium has reduced her imports considerably. This gap has been more than made good by the increased demands for ore for the local steelworks. The March iron-ore production figure of 406,167 tons is a record for the post-war years.

Export Restrictions on Semi-manufactures of Copper and Zinc

Since April 1 last, exports of semi-manufactures of copper and copper alloys have been restricted to approximately half the rate prevailing in the first six months of 1950. The Board of Trade has now announced that, because of the continuing world shortage in the supply of the raw materials involved and the high level of the demand for these semi-manufactures for essential purposes, these restrictions are to be extended in the same form for a further period of three months from the end of June.

The export of semi-manufactures of zinc will continue to be permitted only in exceptional circumstances.

Applications for export licences should be addressed, fully documented, to the Export Licensing Branch of the Board of Trade, Regis House, King William Street, London, E.C.4. The validity of existing licences is not affected by this notice.

Edward Williams Lecture

(*Continued from page 636*)

Acknowledgments

The lecturer acknowledges his indebtedness to the directors of Metropolitan-Vickers Electrical Company Limited, in particular to Sir Arthur P. M. Fleming, C.B.E., D.Eng., director of Research and Education, for permission and facilities in preparing this lecture, to Mr. Fogg, M.Sc., M.I.Mech.E., director of the Motor Industry Research Association for access to the Association's Report No. 1950/2 and the use of Fig. 7.

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2 Motor Industry Research Association Report No. 1950/2, "First Report on the Influence of the Crankshaft Material of Bending Fatigue Strength," by R. J. Love.

3 "Symposium on Graphitization of Steel Piping." A.S.M.E. Annual Meeting, New York, N.Y., December, 1944.

4 Hopping, E. L., and White, A. E., "Report on Graphitization Studies on High-temperature Welding Piping of the Philadelphia Electric Company," A.S.M.E. Annual Meeting, New York, N.Y., December, 1946.

More Foundry Amenites

At a time when the technicalities of the foundry industry are being extensively discussed at the Newcastle Conference of the Institute of British Foundrymen, it is fitting to record that there are again notable advances in æsthetic considerations. The installation of an amenities block at the works of K. & L. Steelfounders and Engineers, Limited, of Letchworth, which is described below, probably embodies the best out of present-day ideas on this subject.

FOUNDRY WORK, by the nature of the materials and processes used, is inevitably not one of the cleanest jobs in industry. Since the war, increased attention has been paid in all progressive foundries to improving working conditions, particularly as regards heating, lighting, and ventilation, and general cleanliness. In this work, K. & L. Steelfounders and Engineers, Limited, have been to the forefront, and have recently completed a new block for the use of their steelfoundry workers embodying the latest ideas on toilet, washing, and cloakroom facilities.

The instructions to their works engineering department were to design this building to provide the fullest facilities, using the highest quality of materials and designs which were available. The results show not only the best ideas from previous practice in other foundries, but many novel features to increase the attractiveness and encourage the fullest use of the facilities provided.

General Arrangement

Broadly speaking, the block, which is designed to cater for 420 men and 40 to 60 staff and women, is divided into five sections, some of which are illustrated in Figs. 1 to 4. The first room through which the employee passes on his way to the foundry is the overcoat cloakroom and drying room. Here his overcoat is hung on a special hanger, and a constant circulation of hot and dried air is maintained in wet weather. From there, the man enters a second room which contains the clean-clothes lockers. Here he takes off all his street clothes, takes his soap and towel, passes through the washing and showerbath section to the working-clothes lockers. He puts his towel and soap in his other locker, dresses himself in his working clothes, passes on to the clocking station, and begins his day's work. At the end of the day or shift the procedure is reversed. The man clocks out, passes into the working-clothes locker section, divests himself of his foundry clothes, hangs them up in his own locker, takes his towel and soap, and goes to the washing and shower section. Here he can please himself whether he has a full shower or merely a good wash; there is ample accommodation for both. He then goes to his street-clothes locker, dresses himself, leaves his soap and towel in this locker, passes through the overcoat cloakroom, and away home. Each man has thus two lockers for which he has a private key.

The whole of washing, shower, and locker rooms are ventilated by a Plenum system which passes dry, clean, and disinfected air through both sets of lockers and throughout the building. The system and boiler house is designed to maintain an even temperature of 75 deg. F. to prevent any discomfort in changing and maintain all clothes in the lockers in a dry condition. Normally the sections of the amenities block described above are kept locked during the day or shift, but for use during working hours there is another section which contains all the usual toilet and washing facilities.

Second Floor

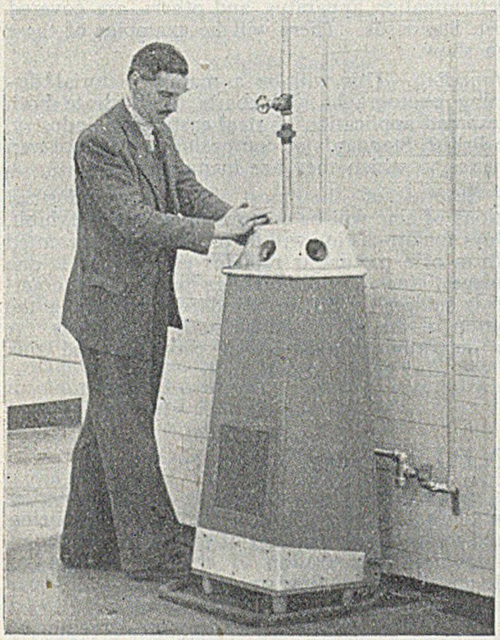
On the second floor of the building, similar but smaller sections provide facilities for the women coremakers and also for the foundry staff. This second floor also houses a full-scale laundry with automatic washers, centrifuges, and drying cabinets to deal adequately with the heavy requirements for clean towels.

The whole internal fabric of the building has been designed, and materials chosen, so as to enable every part to be kept scrupulously clean and to withstand the hard wear to which such accommodation is naturally subjected. All the walls are white-tiled throughout, and are thus easily kept clean by hosing. Wood has been strictly avoided in all the construction. All metal parts and fittings are either heavily galvanised or chromium plated. A special feature are the floors—a special grade of red asphalt was chosen for its warm non-slipping qualities. All floors are laid with large-radius coves and sloping towards channels and drains to ease the problem of high-pressure hosing. Much care and thought went into the design and construction of the showerbaths. These are of the individual type, ensuring the optimum degree of privacy, with the most effective type of water-mixing control, enabling the bather to get with ease the temperature of the water to his liking.

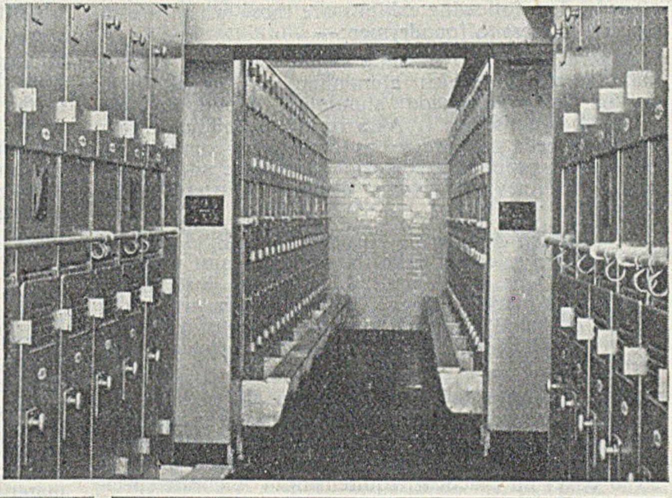
All lockers and air ducting, after galvanising, were painted with special hard-wearing aluminium paint. Lighting is ample, and all fully enclosed. Drinking fountains are placed in suitable situations throughout the building, as also are hot-air hand dryers to supplement the towels. The boiler house, to provide a constant supply of hot water and the heating for the Plenum system, consists of two Robin Hood sectional boilers fired with automatic coal-burning underfeed stokers, each capable of over 1,000,000 B.T.U. per hour. In addition, the boilers provide steam for two calorifiers, each of which has a capacity of 650 gallons of water. The boilers are automatically controlled for both temperature and time, varying the coal feed both day and night, according to the load on the system.

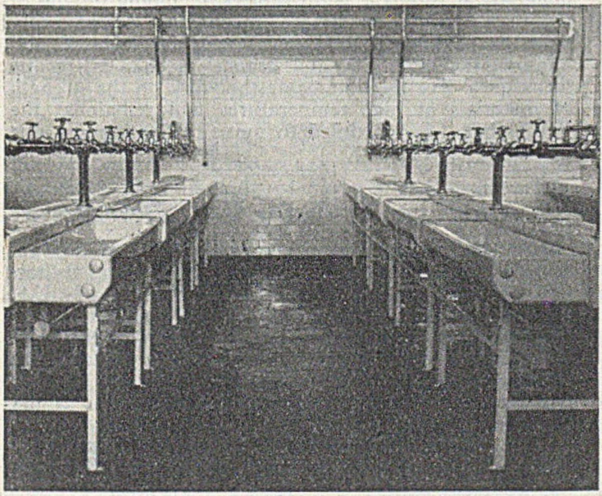
There is little doubt that the facilities provided are greatly appreciated by all the men. There is, in fact, some jealousy from other departments which are not catered for in such a lavish manner.

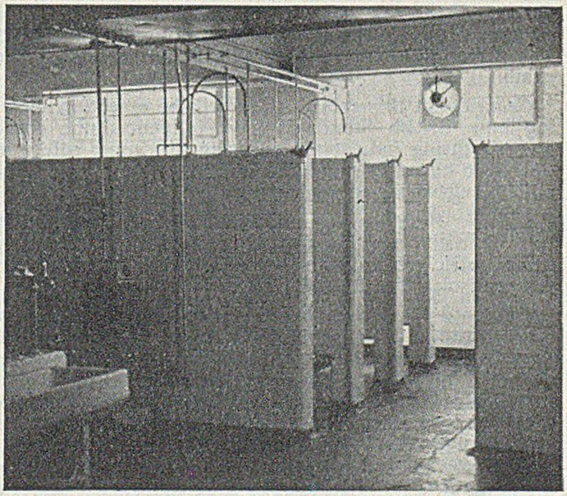
No doubt the ones who derive the greatest benefit from this scheme are the men's wives, since their kitchens and bathrooms and furnishings no longer need be soiled with foundry sand. A scheme of this type cannot be undertaken to-day at a less cost than £60 per man catered for, but as an aid to recruitment and for creating a real sense of satisfaction among the men, it is well worthwhile.



FIGS. 1 TO 4.—*Views of the Amenities Block at K. & L. Steelfounders & Engineers, Limited; (top, left) One of the Hand Driers, (right) a Locker Room; (bottom, left) Individual Washbasins and (right) Shower Cubicles.*







FIVE MEN were injured, two seriously, when an explosion occurred on June 5 in the Glasgow foundry of Mirrlees Watson & Company Limited. A foreman labourer was taken to the Victoria Infirmary suffering from burns to his neck and back. His son, who went to his assistance and tried to tear blazing clothing from his father's body, was badly burnt on the hands but was allowed home after treatment. Another worker was detained in hospital with severe burns to his back and two others also received treatment. The explosion appears to have occurred when a moulding box containing a 20 ft. long metal casting burst, throwing fragments in all directions and showering molten metal for more than 20 yds.

THE PRESIDENT, the Rt. Hon. Sir John Anderson, will preside over the Annual General Meeting of the British Standards Institution on June 22, at 3.0 p.m. at the British Institute of Management.

AT THE ANNUAL GENERAL MEETING of the Institution of Metallurgists held at 4, Grosvenor Gardens, London, last Thursday, the retiring president, Mr. E. W. Colbeck, M.A., welcomed Dr. C. J. Smithells as his successor. Other officers elected were:—*as vice-presidents,* Dr. H. O'Neill and Dr. L. B. Pfeil; *as honorary treasurer,* G. L. Bailey; *as members of Council* (representing Fellows), Dr. A. G. Quarrell and Dr. F. Hunter; *as members of Council* (representing Associates), J. G. Ball and K. W. Clarke; *as member of Council* (representing the Iron and Steel Institute), R. A. Hacking.

British Standards Institution

World's First Standards Exhibition

The Exhibition of the British Standards Institution, the first of its kind, is being held at the Science Museum, South Kensington, from June 18 to 28, from 10 a.m. to 7.0 p.m. daily. There will be many features there of general interest, among them one which answers the question "What are Standards?" while another shows by means of a continuous film-strip how standards are worked out by representative groups of the producers, distributors and users of each class of product concerned. The following exhibits are those which are of especial interest to foundrymen:—

Aluminium.—The exacting requirements of aircraft manufacture, in which aluminium was largely used during the war, made aluminium producers very "standards conscious." As a result, aluminium alloys have now been standardised as to chemical composition, mechanical properties, corrosion resistance and dimensional accuracy. Graphic displays illustrate these techniques.

Certification Marking.—This will be a B.S.I. exhibit illustrating a selection from the wide range of products which are now manufactured under the Institution's certification mark scheme. This permits the use under licence of the B.S.I. mark to indicate conformity with the relevant British Standards for the products concerned.

Copper.—Some hundreds of copper alloys, including phosphor bronzes, gunmetals, aluminium bronzes, brass and many more, were formerly produced by foundries in this country. Standardisation has reduced these to 23 to cover all practical requirements. Accurate specification of the raw materials used has also reduced the number of grades of copper itself to a total of nine. The effect of these economies will be shown on the exhibit.

Cranes.—In this exhibit there will be a section showing how British Standards have influenced the crane manufacturing industry in ensuring maximum safety in operation through standards applied to hooks, chains, pulleys, electrical equipment and other parts.

Electric Welding.—Standardisation has been widely applied in the welding field. This exhibit deals only with electric welding, and shows first the standardisation and classification of electrodes.

Iron and Steel.—As befits the industry which gave birth to the national standards movement, the iron and steel industry is presenting a large exhibit demonstrating and illustrating the application of nearly 400 standards which have been developed in the last fifty years to cover steel for general engineering, electrical engineering, building construction, shipbuilding, pressure-vessel and gas-cylinder materials, and many applications in road, rail and air transport, mining, and almost every industrial activity. A most impressive part of the display includes an animated "flow chart," showing the complex structure of the iron and steel industry and its impact on productive industry in many different fields.

Ironfounding.—Cast-iron products are used in such a wide range of industries that there are over 100 British Standards relating to them. According to the nature of the application these standards specify qualities of material, methods of testing, and standard sizes for a great variety of cast-iron pipes and fittings, valves, rain-water goods, gulleys, and building components of all kinds. The exhibit displays a representative group of these important British Standards.

Laboratory Glassware.—Much valuable time of laboratory technicians is saved by the use of standard glassware such as distillation flasks, measuring cylinders, flasks, pipettes, and burettes. In addition, many specialised pieces of apparatus, such as viscometers, water-determination apparatus, and others, are covered by British Standards. There will be examples of these items on show.

Steelfounding.—This will be a mainly pictorial display, using photographs and charts to illustrate both the widespread application of steel castings in industry, and the British Standards of composition, structure and performance to which they are manufactured.

Zinc.—Several of the most important industrial applications of zinc will be demonstrated in this exhibit. Zinc alloys for die-casting will be dramatically presented in the form of a motor-car radiator grill, which is one of the biggest zinc-alloy die-castings made in this country, and is subject to British Standards controlling the composition of the alloy and methods of analysis. A test for determining thickness of cadmium and zinc plating will also be illustrated.

N.P.L. Research for Scotland

Some of the work being done in the Engineering Division of the National Physical Laboratory is being transferred to the new laboratory of the mechanical engineering research organisation of the Department of Scientific and Industrial Research at East Kilbride, near Glasgow. The main section of the research work to be transferred is that concerned with the strength of materials at ordinary temperatures, including fatigue of materials, failures in service, mechanical design problems, gas cylinders, mechanical tests on metallic and non-metallic materials, and general mechanical testing techniques. For the time being the work on the strength of materials at high temperatures will remain at the N.P.L. but it is scheduled to move to Scotland in due course.

American Tools for U.K. Defence

The Economic Co-operation Administration announced on June 4 that Britain has been authorised to use $112,000,000 (£40,000,000) of U.S. Military Aid Funds for American-made machine tools. Finance for these tools, which are needed for the U.K. defence production programme, will be provided from funds appropriated by Congress for the Mutual Defence Assistance Programme to help the North Atlantic Treaty Nations to rearm.

The authorisation does not affect the suspension, since January 1 last, of direct economic aid to the U.K. under the Marshall plan.

Canadian Iron and Steel Output Rises

April's production of iron and steel in Canada showed a sharp increase over April, 1950.

Pig-iron output at 211,112 tons compared with 188,143 tons in April of last year, and for the first four months of the year at 821,967 (715,224) tons. Output of ferro-alloys in the month was 19,552 (11,743) tons, and for the four months 76,996 (44,008) tons. The combined production of steel ingots and castings in April totalled 312,005 (279,320) tons, and 1,217,864 (1,121,693) tons for the first four months.

Birthday Honours

The Birthday Honours List, published last week, announced awards to many people associated with the iron and steel, and allied industries, in recognition of their services. Brief notes on some of the principal awards are given below.

Knights Bachelor

MR. D. ANDERSON, senior partner, Mott, Hay & Anderson, consulting civil engineers, president of the Institution of Civil Engineers, 1943-44; MR. R. DUNCALFE, chairman of the general council of the British Standards Institution; MR. B. G. HARRISON, chairman of Harrison & Sons, Limited (printers of the FOUNDRY TRADE JOURNAL); DR. H. W. HUGH WARREN, managing director of Associated Electrical Industries, Limited, and a director of British Thomson-Houston Company, Limited, Edison Swan Electric Company, Limited, Metropolitan-Vickers Electrical Company, Limited, and other companies and MR. J. R. YOUNG, a director of Vickers, Limited, and Vickers-Armstrongs, Limited, and chairman of a number of companies, including Steel Investments, Limited, and Robert Boby, Limited, of Bury St. Edmunds.

Order of the Bath

K.C.B.

SIR EDWIN N. PLOWDEN, chief planning officer and chairman of the Economic Planning Board since 1947, a director of C. Tennant, Sons & Company, Limited, and of the British Aluminium Company, Limited.

C.B.

MR. T. E. HARRIS, chief superintendent, Royal Ordnance Factory, Woolwich.

Order of the British Empire

G.B.E.

THE EARL OF CRAWFORD AND BALCARRES, joint vice-chairman of the Lancashire Steel Corporation, Limited, and a director of Rylands Bros., Limited.

K.B.E.

SIR FREDERICK LEGGETT, formerly deputy secretary to the Ministry of Labour and National Service; and MR. H. D. MACLAREN, director of electrical engineering, Admiralty, since 1945.

C.B.E.

MR. J. ALEXANDER, general manager and secretary, Belfast Harbour Commissioners; MR. J. C. BENNETT, director of Henry Gardner & Company, Limited; MR. W. K. BRASHER, secretary of the Institution of Electrical Engineers; MR. H. T. CHAPMAN, managing director of Armstrong-Siddeley Motors, Limited; MR. W. H. CHATTEN, assistant director of Dockyards, Admiralty; MR. E. CROWTHER, chairman of the Northern Gas Board; MR. G. F. EARLE, chairman and joint managing director of Associated Portland Cement Manufacturers, Limited; MR. A. N. EAST, chief engineering Inspector Ministry of Fuel and Power; MR. J. W. ELLIOTT, chairman of Swan, Hunter & Wigham Richardson, Limited, and other companies; MR. G. W. H. GARDNER, director of guided weapons research and development, Ministry of Supply; MR. G. W. HARRIMAN, deputy managing director of Austin Motor Company, Limited; MR. H. A. HEPBURN, deputy chief inspector of factories, Ministry of Labour and National Service; MR. L. HOWLES, chairman of the South Wales Electricity Board; PROF. D. T. JACK, chairman of the Newcastle-upon-Tyne Local Employment Committee; MR. V. A. G. LAMBERT, director-general of armament production, Ministry of Supply; MR. W. T. OTTWAY, chairman and managing director of W. Ottway & Company, Limited; MR. W. E. W. PETTER, deputy managing director of Folland Aircraft, Limited; MR. GEORGE WOOD, chairman of Thos. W. Ward, Limited, Sheffield, chairman of several other companies, including John Fowler & Company (Leeds), Limited, and who holds directorships in several other companies.

O.B.E.

MR. J. F. ALCOCK, chief scientist, Ricardo & Company (1927), Limited; MR. A. H. J. BOWN, general manager and clerk, River Wear Commissioners; MR. L. CLEAVER, harbour engineer, Docks and Canals Division, Ministry of Transport; MR. H. A. COCHRAN, manager, minerals division, Colonial Development Corporation; DR. R. FRITH, principal scientific officer, Air Ministry; MR. H. GARRATT, principal, Chance Technical College, Smethwick; MR. P. H. GOFFEY, principal patents and awards officer, Ministry of Supply; MR. W. J. HANDY, deputy director of contracts, Ministry of Supply; DR. H. HOLLINGS, controller of research, North Thames Gas Board; MR. S. R. HOWES, a director and general manager of Samuel Fox & Company, Limited; MR. W. B. JOHNSTONE, a director of Alexander Stephen & Sons, Limited; MR. C. A. MEEK, principal scientific officer, Ministry of Supply; MR. H. O. MISSENDEN, general manager, Birmingham British Industries Fair; MR. H. NOBLE, senior principal scientific officer, Admiralty Signal and Radar Establishment; MR. T. H. O'BRIEN, member of the Cumberland and Westmorland District Committee, Northern Regional Board for Industry; MR. F. V. PIPE, chairman, Derby District Committee, North Midlands Regional Board for Industry; MR. H. R. M. POLLARD, lately senior Scottish officer, Ministry of Fuel and Power; MR. M. H. THOMAS, chief industrial officer, Council of Industrial Design; MR. G. L. TURNEY, assistant director, Directorate of Scientific Intelligence, Ministry of Defence; MR. J. W. T. WALSH, senior principal scientific officer, Department of Scientific and Industrial Research; and MR. J. W. WILKINSON, lately chief of armament design, Vickers-Armstrongs, Limited.

M.B.E.

MR. D. M. BARCLAY, manager, Mountstuart Dry Docks, Limited, Cardiff; MR. J. J. CULLION, vice-chairman, Lanarkshire District Committee of the Scottish Board for Industry; MR. A. DAVENPORT, general works manager, Salford Electrical Instruments, Limited; MR. C. B. DICKENS, head of purchasing department, Richard Johnson & Nephew, Limited; MR. W. J. ENGLISH, vice-chairman, Somerset District Committee of South-Western Regional Board for Industry; MR. A. C. FRANKLIN, chief engineer, Worthington-Simpson, Limited; MR. J. S. GILLIES, assistant engineer manager, William Doxford & Sons, Limited; MR. W. J. GOWER, senior executive officer, Department of Scientific and Industrial Research; MR. W. GRAHAM, personnel manager, Darlington & Simpson Rolling Mills, Limited, Darlington; MR. G. B. JONES, chairman, Huddersfield and Halifax District Committee of the East and West Ridings Regional Board for Industry; MR. J. C. KIRKPATRICK, chief welfare officer, English Electric Company, Limited, Liverpool; MR. W. C. MEREDITH, foundry manager, Hadfields, Limited, Sheffield; MR. E. H. NIBLETT, technical and works director, Wright & Weaire, Limited, electrical and radio engineers, of South Shields; MR. R. PARKES, managing director, Whites-Nunan, Limited, engineers, etc., of Salford; MR. G. F. W. PATTERSON, chief metallurgist, Murex, Limited, Rainham; MR. A. E. PICKERING, chief engineer, design and drawing office, Parsons Marine Steam Turbine Company, Limited, Wallsend-on-Tyne; MR. C. G. PURKIS, labour officer, Harland & Wolff, Limited, North Woolwich; MR. W. R. SNELL, Diesel works production manager, Ruston & Hornsby, Limited, Lincoln; MR. A. L. THOROGOOD, principal scientific officer, Department of Scientific and Industrial Research; MR. W. A. WILLIAMS, works manager, Perry Chain Company, Limited.

News in Brief

DOUBLING of the present £150,000 of capital by a one-for-one scrip bonus is proposed by the directors of Yarrow & Company, Limited, the Glasgow shipbuilders and engineers.

THE EXECUTIVE OFFICES of Blaw Knox, Limited, as from June 11, are at 90-94, Brompton Road, London, S.W.3 (telephone: Kensington 5151; telegraphic address: Blawnox Southkens London).

A PORTABLE, type 241, transformer welding set made by Murex Welding Processes Limited, Waltham Cross, Herts., is exhibited in the County Pavilion in the South Bank section of the Festival of Britain.

BLABY (LEICS.). RURAL DISTRICT COUNCIL HOUSING AND PLANNING COMMITTEE has rejected plans in connection with a proposed foundry to be built at Glen Ford Grange, Little Glen Road, Glen Parva, Leics.

WHILE WORKING at the Gildersome Foundry of Robert Hudson Limited, light railway engineers, on June 9, Mr. E. Naylor, aged 64, collapsed and died before the arrival of an ambulance bringing a doctor.

RUSTON & HORNSBY, LIMITED, of Lincoln will supply machinery for a passenger-cargo motor ship for the Straits Steamship Company, Limited, Singapore, to be made by the Caledon Shipbuilding and Engineering Company, Limited, Dundee.

SHELL-MEX AND B.P., LIMITED, announce an increase under their inland trade price schedule of ⅛d. per gallon for B.P. Britoleum, effective on June 7. This advance is due to the increase in freight rates which has already been reflected in the prices of other petroleum products.

OWING to the shrinkage in the arrivals of foreign ore and scrap, the volume of Tees imports in the first four months of this year fell to 809,258 tons, compared with 1,191,920 tons in the corresponding period of 1950. In the same period exports increased from 560,531 tons to 605,636 tons.

PRELIMINARY ARRANGEMENTS have been made between the Midland section of the Institute of Vitreous Enamellers and the Curator of Wolverhampton Art Gallery and Museum for there to be installed in the Museum an exhibit of vitreous enamelling. Firms are being approached for suitable showpieces.

AN OFFER for the shares of Bowden (Engineers), Limited, Willesden Junction, London, N.W.10, at present privately held, is being made under the auspices of Robert Benson, Lonsdale & Company, Guinness, Mahon & Company and Read, Hurst-Brown & Company. The ultimate view is the opening of the company to the public investor.

THE EXHIBITION OF SCIENCE at South Kensington is now closing at 6 p.m. instead of 10 p.m., but will continue to open at 10 a.m. Opening times will be kept under review and extended as demand warrants it, but it is stated by the Festival of Britain office that the public is concentrating on the South Bank exhibition at the moment. Up to May 31, more than 40,000 people paid for admission to the science exhibition.

MR. FRANK WADE, managing director of Frank Wade Limited, ironfounders, Stambermill, Stourbridge, has flown to Nairobi. He proposes to investigate the conditions under which ploughing is carried out in tropical countries. The information collected will be of considerable importance to the firm, which specialises in the manufacture of ploughshares, particularly for use under modern conditions of tractor ploughing.

A MEETING of holders of the preference and ordinary stock of Hadfields, Limited, will be held at East Hecla works, Sheffield, on June 22, in order that Mr. A. G. Thomas, the stockholders' representative, may present his statement. The stockholders' representative was nominated under the Iron and Steel Act to represent the interests of holders of securities in connection with the determination of the amount of compensation payable.

THE LIBRARIAN of the Board of Trade, who is always glad to receive copies of publications about their trade issued by individual firms or trade associations, is particularly concerned that publications on the organisation of trades and industries should be well represented in the board's library. He would welcome histories of firms and associations, whether in the form of books or of descriptive brochures. They should be addressed to the Librarian, Board of Trade, I.C. House, Millbank, London, S.W.1.

THE CENTRAL STATISTICAL OFFICE'S index number of industrial production in the United Kingdom during March is provisionally estimated to be 142, which represents a fall of eight points from the level of the previous month. The decline is largely the result of the Easter holiday, which occurred during the month, but shortages of raw materials may also have had some effect in lowering the index. The index figure for March, 1950, was 144.

THE WEST HARTLEPOOL WORKS of the South Durham Steel & Iron Company, Limited, has resumed full production, following a hold-up caused by a cracked entablature in the slabbing mill. Repairs have been carried out by the company's Stockton-on-Tees works in conjunction with Head, Wrightson & Company, Limited, and Blackett, Hutton & Company, Limited. During the repair period output was down to 70 per cent. of normal, but this loss is expected to be made up during the next few weeks.

THE STORY of the origin and development of Queen's Island, one of the largest single shipyards in the world, is told in the shipbuilding section at the Northern Ireland Festival of Britain Farm and Factory Exhibition, which was opened by the Queen at Castlereagh, Belfast, on June 1. Champagne bottles bearing the names of some of the famous ships built by Harland & Wolff, Limited, are displayed, and there is a scale model of the shipyard area of Belfast harbour in a tank 14 ft. long, containing ships in motion under electro-magnetic control.

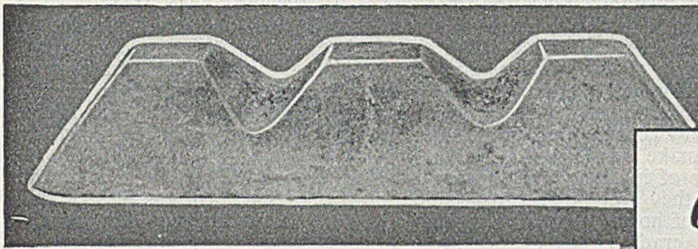
ARRANGEMENTS ARE BEING MADE to market the 5s. ordinary shares and the 5½ per cent. £1 cumulative redeemable preference shares of J. A. Prestwich Industries, Limited. The company is a recent formation which is taking over the engine-making business founded about 50 years ago by Mr. J. A. Prestwich, the present chairman. Production in latter years has turned largely to the manufacture of industrial engines for small electric light plants, pumping machinery, etc. The company is also taking over a pencil-making business started by Mr. Prestwich about 1919.

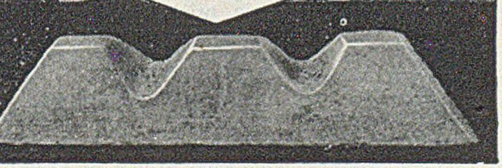
Personal

MR. FRANK M. ROBINSON, who for the past 13 years has been general manager of the iron-ore mines and quarries of Richard Thomas & Baldwins, Limited, has retired and has taken up residence at Fox Ghyll, Saltburn-by-the-Sea (Yorks).

MR. CECIL THOMAS WILSHAW, chief metallurgist with F. Perkins, Limited, Diesel engine manufacturers, of Peterborough, has been elected to the national executive committee of the Association of Scientific Workers. Aged 34, he joined the association in 1942.

MR. R. W. GREGORY, of R. W. Gregory & Partners, consulting engineers, of Newcastle-upon-Tyne, has completed 50 years' service in the electrical industry on Tyneside. He was with Merz & McLellan for 30 years before starting business on his own account 17 years ago and has twice been chairman of the north-eastern centre of the Institution of Electrical Engineers.





Raw Material Markets

Iron and Steel

The shrinkage in the tonnages of scrap at the disposal of the steelmakers has been partly offset by the use of more pig-iron in the open-hearth furnaces. This has been made possible by the diversion of certain blast furnaces from the production of foundry to basic pig-iron. For the foundry trade the results are unfortunate. Blast-furnacemen are unable to provide consumers allocated tonnages at present, and the latter are compelled to resort to all sorts of expedients to make up their furnace mixtures. No doubt their stocks of iron have dwindled to very small proportions, but they are apparently able to carry on, and as production of home ore rises, and the fuel situation improves, a gradual expansion of blast-furnace outputs is promised. Meanwhile, quite a few stacks are still on slack blast.

The prospects of an increased intake of foreign semis are not very bright. A rise in Belgian steel export quotations is symptomatic of the increasing pressure on Continental productive capacity. There is, in fact, a widening gap between supply and demand and European producers are falling heavily into arrears with their deliveries. At home the drop in steel production has also involved some reduction in billet deliveries and the sheetmakers are also concerned about the maintenance of essential supplies of sheet bars and slabs. The deficiencies are not yet serious, but it is noticeable that re-rollers of light sections and bars and sheetmakers in general are developing a keen interest in defectives as well as primes.

Some of the finishing mills are working below capacity limits in consequence of the reduced ingot output. Hence the imposition of the export licensing system. Moreover, the shipping position is still difficult and delays unavoidable. But deliveries of finished steel to home consumers are maintained at a fairly high level except in Scotland, and fulfilment of rearmament orders has not involved more than modest encroachments upon supplies to commercial users. There is, however, intense pressure for sheets, light plates, and sections. Rail mills have very heavy commitments and wire drawers are offered far more business than they can handle.

Non-ferrous Metals

In the unofficial trading session on the London Metal Exchange last Friday afternoon, the three months' tin quotation fell to £999 per ton buyers, with sellers at £1,000. Not since December last had the quotation been under £1,000, while in February the forward price soared to £1,560, with cash at the record high level of £1,615. It will be recalled that last week brought the news that the Reconstruction Finance Corporation had reduced its offering price of tin to United States consumers by 7 cents per lb. to 129 cents, which was equivalent to a decline of about £55 per ton, making the American quotation about £1,032 per ton.

New weakness developed in tin prices in London on Monday, the decline in prices continuing during the week.

Official tin quotations on the London Metal Exchange were as follow:—

Cash—Thursday, £1,045 to £1,050; Friday, £1,040 to £1,045; Monday, £995 to £1,005; Tuesday, £990 to £995; Wednesday, £980 to £990.

Three Months—Thursday, £1,028 to £1,029; Friday, £1,012 10s. to £1,015; Monday, £970 to £972 10s.; Tuesday, £967 10s. to £970; Wednesday, £957 10s. to £960.

Export zinc was quoted higher in New York last week, but the domestic price for copper remained at 24½ cents, although consumers buying Chilean brands were required to pay 27½ cents.

The revised non-ferrous scrap prices came into force at the beginning of last week, but, so far, there is no indication that metal is flowing more freely. The scrap distribution Order is due to become effective on July 2. This means that from that date a licence will be necessary for the sale or purchase of scrap metal, and would-be purchasers will be required to furnish details of their stocks. It is hoped that by this means a check will be kept upon the movement of secondary metal.

The Bureau of Non-ferrous Metal Statistics reports that consumption of copper in April was 46,997 tons, making a total of 190,357 tons for the four months, compared with 165,548 tons in the corresponding period last year. United Kingdom stocks at April 30 were 115,040, or about 6,000 tons up on March 31. Stocks of zinc stood at 31,582 tons, compared with 34,985 tons a month earlier, while reserves of lead fell from 32,470 tons at March 31 to 24,669 tons at April 30. Consumption of lead rose by about 1,300 tons, but usage of zinc was practically unchanged.

Conservation of Scarce Matals

The Anglo-American Council on Productivity is shortly sending an unusual special mission to the United States to find how British industry can improve its industrial housekeeping and use scarce materials in the strictest possible way. In the metal-using industries it is now increasingly necessary to employ "skinflint metallurgy." The group is a small and specially selected one chosen in consultation with a number of the principal associations. A list of members of the group includes:—Sir Graham Cunningham, K.B.E., LL.B., as leader; Mr. H. W. Bowen, O.B.E., M.I.MECH.E., managing director, E. M. I. Factories, Limited; Mr. F. E. Chappell, director, Harold Whitehead & Partners, Limited; Mr. F. V. Everard, M.I.MECH.E., works executive director, Belliss & Morcom, Limited; Mr. J. Hampson, chief buyer, Leyland Motors, Limited; Mr. D. A. Oliver, M.SC., metal economy adviser to the Ministry of Supply and director of research, the B.S.A. Group Research Centre; Major P. L. Teed, deputy director of aircraft research and development, Vickers-Armstrongs, Limited, and Mr. B. White, B.SC., technical director, Federation of British Industries, who is acting as secretary.

The team leaves by air on June 17, and returns in the "Mauretania" on July 13.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference E.P.D. or C.R.E. can be obtained from the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, London, S.W.1.

BANGKOK, June 15—Machine tools, steel sheet piles, reinforced steel bars, etc., for the Royal Irrigation Department, Thailand. Room 1081 (CRE (IB) 62165/51).

NAIROBI, July 2—Cast/spun iron pipes and specials, for the City Council. Howard Humphreys & Sons, Victoria Station House, 191, Victoria Street, London, S.W.1.

NAIROBI, July 2—Sluice valves, penstocks, handstops, etc., for the City Council. Howard Humphreys & Sons, Victoria Station House, 191, Victoria Street, London, S.W.1.

CAISTOR, June 29—Supplying and laying about 490 yds. of 5 in. dia. spun-iron pumping mains, etc., for the Rural District Council. Mr. J. H. Haiste, consulting engineer, 4, Queen Square, Woodhouse Lane, Leeds, 2. (Deposit, £3 3s.)

NEW ZEALAND, June 21—Three electric overhead travelling cranes, for the New Zealand Railways. Room 1092 (CRE (IB) 62317/51).


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Photo micrograph of SOMERFORD SAND
Photo micrograph of K.L. SILICA SAND
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Photo micrograph of MAXIMUM SAND
GENERAL REFRACTORIES LIMITED SHEFFIELD

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered, unless otherwise stated)

June 13, 1951

PIG-IRON

Foundry Iron.—No. 3 Iron, Class 2:—Middlesbrough, £10 17s. 9d.; Birmingham, £10 13s.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £12 9s., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si)—North Zone, £12 16s. 6d.; South Zone, £12 19s.

Scotch Iron.—No. 3 foundry, £12 7s. 9d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £13 7s. 6d.; South Zone, £13 10s.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £13 17s. 6d.; South Zone, £14.

Cold Blast.—South Staffs, £16 10s. 6d.

Hematite.—Si up to 2½ per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. Coast and N.-W. Coast of England, £12 7s. 6d.; Scotland, £12 14s.; Sheffield, £13 2s. 6d.; Birmingham, £13 9s.; Wales (Welsh iron), £12 7s. 6d.

Spiegeleisen.—20 per cent. Mn, £18 3s.

Basic Pig-iron.—£10 19s. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered.)

Ferro-silicon (6-ton lots).—40/55 per cent., £37 15s., basis 45% Si, scale 14s. per unit; 70/84 per cent., £52, basis 75% Si, scale 14s. 6d. per unit.

Silicon Briquettes (5-ton lots and over).—2lb. Si, £44 2s.; 1lb. Si, £45 2s.

Ferro-vanadium.—50/60 per cent., 15s. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 9s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £167; ditto, copper-free, £183.

Ferro-tungsten.—80/85 per cent., 34s. 9d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 36s. 9d. per lb. of W.

Ferro-chrome (6-ton lots).—4/6 per cent C, £66, basis 60% Cr, scale 22s. per unit; 6/8 per cent. C, £61, basis 60% Cr, scale 21s. per unit; max. 2 per cent. C, 1s. 6¾d. per lb. Cr; max. 1 per cent. C, 1s. 7¼d. per lb. Cr; max. 0.15 per cent. C 1s. 8d. per lb. Cr.; max. 0.10 per cent. C, 1s. 8¼d. per lb. Cr.

Chromium Briquettes (5-ton lots and over).—1lb. Cr, £69 4s.

Cobalt.—98/99 per cent., 17s. 6d. per lb.

Metallic Chromium.—98/99 per cent., 5s. 9d. per lb.

Ferro-manganese (blast-furnace). — 78 per cent., £37 19s. 10d.

Manganese Briquettes (5-ton lots and over).—2lb. Mn, £46 18s.

Metallic Manganese.—96/98 per cent., carbon-free, £215 per ton.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—Basic: Soft, u.t., £17 4s.; tested, up to 0.25 per cent. C (100-ton lots), £17 9s.; hard (0.42 to 0.60 per cent. C), £19 4s.; silico-manganese, £24 6s. 6d.; free-cutting, £20 9s. Siemens Martin Acid: Up to 0.25 per cent. C, £22 11s. 6d.; case-hardening, £23 9s.; silico-manganese, £26 14s.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £20 4s.; basic, hard, over 0.41 up to 0.60 per cent. C, £21 9s.; acid, up to 0.25 per cent. C, £23 9s.

Sheet and Tinplate Bars.—£17 6s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £21 3s.; boiler plates (N.-E. Coast), £22 10s. 6d.; chequer plates (N.-E. Coast), £23 8s.; heavy joists, sections, and bars (angle basis), N.-E. Coast, £20 1s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested, £22 15s.; flats, 5 in. wide and under, £22 15s.; hoop and strip, £23 10s.; black sheets, 17/20 g., £29 13s.; galvanised corrugated sheets, 17/20 g., £43 6s.

Alloy Steel Bars.—1-in. dia. and up: Nickel, £37 19s. 3d.; nickel-chrome, £56 6s.; nickel-chrome-molybdenum, £63 1s.

Tinplates.—48s. 3½d. per basis box.

NON-FERROUS METALS

Copper.—Electrolytic, £234; high-grade fire-refined, £233 10s.; fire-refined of not less than 99.7 per cent., £233; ditto, 99.2 per cent., £232 10s.; black hot-rolled wire rods, £243 12s. 6d.

Tin.—Cash, £980 to £990; three months, £957 10s. to £960; settlement, £985.

Zinc.—G.O.B. (foreign) (duty paid), £160; ditto (domestic), £160; "Prime Western," £160; electrolytic, £164; not less than 99.99 per cent., £166.

Lead.—Good soft pig-lead (foreign) (duty paid), £160; ditto (Empire and domestic), £160; "English," £161 10s.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £180; rolled zinc (boiler plates), all English destinations, £178; zinc oxide (Red Seal), d/d buyers' premises, £178.

Other Metals.—Aluminium, ingots, £124; antimony, English, 99 per cent., £390; quicksilver, ex warehouse, £73 10s. to £74; nickel, £454.

Brass.—Solid-drawn tubes, 24½d. per lb.; rods, drawn, 27d.; sheets to 10 w.g., 28⅝d.; wire, 30½d.; rolled metal, 27⅝d.

Copper Tubes, etc.—Solid-drawn tubes, 26⅞d. per lb. wire, 261s. 9d. per cwt. basis; 20 s.w.g., —s. per cwt.

Gunmetal.—Ingots to BS. 1400—LG2—1 (85/5/5/5), £285; BS. 1400—LG3—1 (86/7/5/2), £302; BS. 1400—G1—1 (88/10/2), £369; Admiralty GM (88/10/2), virgin quality, — , per ton, delivered.

Phosphor-bronze Ingots.—P.Bl, £379; L.P.Bl, £322 per ton.

Phosphor Bronze.—Strip, 39¼d. per lb.; sheets to 10 w.g., 41⅞d.; wire, 44d.; rods, 39¾d.; tubes, 44¾d.; chill cast bars: solids —, cored, —. (C. Clifford & Son, Limited.)

Nickel Silver, etc.—Ingots for raising, 2s. 6½d. per lb. (7%) to 4s. 6¾d. (30%); rolled metal, 3 in. to 9 in. wide × .056, 3s. 0½d. (7%) to 4s. 0¾d. (30%); to 12 in. wide × .056, 3s. 0¾d. to 4s. 1d.; to 25 in. wide × .056, 3s. 2¾d. to 4s. 3d. Spoon and fork metal, unsheared, 2s. 9¼d. to 3s. 9¾d. Wire, 10g., in coils, 3s. 6½d. (10%) to 4s. 6½d. (30%). Special quality turning rod, 10%, 3s. 5¼d.; 15%, 3s. 10½d.; 18%, 4s. 2¾d. All prices are net.

Forthcoming Events

JUNE 18 to 28

British Standards Institution

Exhibition at the Science Museum, South Kensington, London. Opening at 11.30 a.m. on June 18 by the president of the Board of Trade; daily opening hours, 10 a.m. to 7 p.m.

JUNE 19

Institution of Production Engineers

Wolverhampton Graduate Section:—"Industrial Economics," by C. Tragen, M.A., at the Wolverhampton and Staffordshire Technical College, Wolverhampton, at 7.30 p.m.

JUNE 22

British Standards Institution

Conversazione at 8 p.m. at the Natural History Museum, South Kensington, London.

Increases of Capital

The following companies are among those which have announced details of capital increases:—

ALBION FOUNDRY, LIMITED, Tipton (Staffs), increased by £20,000, in £1 ordinary shares, beyond the registered capital of £20,000.

JOHN VARLEY, LIMITED, ironmasters, etc., of St. Helens, increased by £50,000, in £1 ordinary shares, beyond the registered capital of £26,000.

PRIMON ENGINEERING COMPANY, LIMITED, London, S.W.5, increased by £5,000, in £1 ordinary shares, beyond the registered capital of £5,000.

RELIANCE FOUNDRY NORWOOD, LIMITED, London, S.E.14, increased by £8,000, in £1 ordinary shares, beyond the registered capital of £4,000.

MOTHERWELL MACHINERY & SCRAP COMPANY, LIMITED, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £10,000.

H. SCHUBERT, LIMITED, ironfounders, etc., of London, E.C.1, increased by £19,000, in £1 ordinary shares, beyond the registered capital of £1,000.

BRIFFAULT RANGE COMPANY, LIMITED, London, N.7, increased by £4,000, in £1 redeemable preference shares, beyond the registered capital of £6,000.

B. K. MORTON & COMPANY, LIMITED, iron and steel merchants, etc., of Sheffield, increased by £15,000, in £1 shares, beyond the registered capital of £10,000.

W. L. BYERS & COMPANY, LIMITED, anchor and chain manufacturers, etc., of Sunderland, increased by £40,000, in £1 ordinary shares, beyond the registered capital of £10,000.

V.P. BEARINGS (RAW MATERIALS), LIMITED, iron and brass founders, toolmakers, etc., of London, E.C.4, increased by £9,900, in £1 shares, beyond the registered capital of £100.

WINGROVE & ROGERS, LIMITED, engineers, founders, etc., of Liverpool, increased by £30,000, in £1 non-cumulative redeemable 5 per cent. preference shares, beyond the registered capital of £30,000.

HUNT BROS. (OLDBURY), LIMITED, ironfounders, etc., of Oldbury, increased by £11,000, in £1 ordinary shares, beyond the registered capital of £15,000. At June 14, 1949, Engineers & Ironfounders, Limited, held 9,278 £1 ordinary shares out of 10,528 issued.

YORK SHIPLEY, LIMITED, mechanical, electrical, and general engineers, etc., of London, N.W.2, increased by £150,000, in 100,000 inclusive and 50,000 5 per cent. cumulative redeemable preference shares of £1, beyond the registered capital of £50,000.

BROOKES (OLDBURY), LIMITED, engineers, ironfounders, etc., of Oldbury, increased by £11,000, in £1 ordinary shares, beyond the registered capital of £15,000. At June 14, 1949, Engineers & Ironfounders, Limited, held 11,200 £1 ordinary shares of 15,000 issued.

M. MOLE & SON, LIMITED—Mr. C. Ernest Cowney and Mr. Brian Morgan have been appointed directors.

ABOUT 100 MEN at the Steel, Peech & Tozer branch of the United Steel Companies, Limited, Rotherham, which recently announced the closing of five furnaces owing to lack of raw material, are to be compulsorily retired. A statement issued by the company on May 30 said: "With the entry into the industry of young men, and the existing labour force growing up and gaining more experience, it is not possible to find employment for the increased numbers. It is therefore now necessary to implement the provisions of the company's pension scheme to retire those men who have attained the stipulated age of 65."

CLASSIFIED ADVERTISEMENTS

PREPAID RATES : **Twenty words for 5s. (minimum charge) and 2d. per word thereafter. Box Numbers. 2s. extra (including postage of replies).**

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, 49, Wellington Street, London, W.C.2. If received by first post Tuesday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

FOUNDRY MANAGER seeking position, with scope, with small Midlands foundry (grey or malleable). Age 45. M.I.B.F. Practical all depts., good technical control, cupola, sand, cores, etc. Modern methods, plate layout, stump floor or machine, mechanisation. Salary with results basis. Good connection, record and references.—Box 1045, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN requires position Midlands. Now with West Bromwich foundry. Fully practical man, mechanised, stump, floor machine light castings, accustomed setting piecework prices, take full charge. Small foundry preferred. Black Country district. Salary/results basis preferred. Excellent references and record. Age 46. M.I.B.F.—Box 1044, FOUNDRY TRADE JOURNAL.

WANTED position, OFFICE MANAGER or CHIEF CLERK. Age 53. Adaptable, experienced office routine, sales, purchases, accounts to final figures, correspondence, stores records. At present Office Manager, Engineers and Founders, business merging into larger concern.—Box 1022, FOUNDRY TRADE JOURNAL.

FOREMAN PATTERNMAKER (47), married, now employed with large non-ferrous London founders, sand and die, seeks position of trust where ability and general foundry knowledge, including die design and technical sales experience, are an asset.—Box 1003, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (age 45). Capable and energetic. Wide experience in general jobbing work, semi mechanised plant, grey and high duty irons, cupola practice, controlling skilled and unskilled labour. M.I.B.F.—Box 1036, FOUNDRY TRADE JOURNAL.

METALLURGIST (32), A.I.M., 16 years' experience in high quality engineering (ball and roller bearings and aircraft components) and cast iron production, forging, electro-plating, control of metallurgical and chemical laboratories, seeks responsible progressive position. S. England preferred.—Box 1032, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER desires immediate change. Age 45. At present Manager and Director Midland foundry. Specialist repetition grey and malleable, full and semi mechanised plant, machine, plate, snap flask work. M.I.B.F., A.M.I.P.E. Excellent technical knowledge cupola, sand control, etc. Practical man, tactful, control labour, train unskilled, and can get results. Moderate salary to commence. Preferably Black Country area. Excellent record and refs. Consider Superintendent or Senior Foreman's post.—Box 1043, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

WANTED.—JOBBING MOULDERS FOR NON-FERROUS WORK IN EAST LONDON AREA. GOOD FACILITIES.—Box 1040, FOUNDRY TRADE JOURNAL.

METALLURGIST required for Jobbing Foundry, South Glasgow. Applicants must have metallurgical and analytical experience of a wide range of non-ferrous alloys and cast iron. To be in charge of making up metal mixtures for crucibles and cupolas. The post offers wide scope of foundry activities for a progressive, intelligent young man.—Staff pension, age, and salary expected, to Box 1038, FOUNDRY TRADE JOURNAL.

FLOOR MOULDERS required for Aluminium Foundry in the South Midlands area. For suitable applicants, accommodation could be arranged.—Box 1016, FOUNDRY TRADE JOURNAL.

JUNIOR ASSISTANT METALLURGICAL CHEMIST required for Marine Engineering Works in Belfast.—Apply, stating age, experience, and salary required, to Box 1002, FOUNDRY TRADE JOURNAL.

ASSISTANT FOREMAN wanted for small Iron Foundry, East Anglia. State salary wanted and give full details of training and experience.—Box 1030, FOUNDRY TRADE JOURNAL.

DRAUGHTSMAN required for Foundry Consultant's office. Foundry experience essential. Experience of Mechanical Handling an advantage. Able to work with minimum supervision.—Apply, stating salary, age, experience, etc., to P. C. FASSOTTE, Trevelyan Chambers, Boar Lane, Leeds, 1.

FOUNDRY FOREMAN, with first-class experience of gravity diecasting. Full details of experience, age, and salary required.—MARSHALL CASTINGS, LTD., Mount Street, Nechells, Birmingham, 7.

FOUNDRY TECHNICIAN for Laboratory in mechanised Grey Iron Foundry in Midlands. Experience in analysis, sand and metal control, and age 25-35 years.—Apply, with full details of education, experience, and salary required, Box 1029, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for fully mechanised foundry in Doncaster area, producing Iron and Steel castings up to 10 cwts. Applicants must have previous experience of this class of work and be able to organise unskilled operators. The post is permanent, and a good salary will be paid to successful applicant. Single man preferred on account of accommodation difficulties.—Apply Box 1027, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*Contd.*

PATTERNMAKERS wanted. Wood and metal. Constant employment.—Apply J. H. MAY, 117, Central Street, London, E.C.1.

FOUNDRY MANAGER required for Light Castings Foundry in North-West Area. Good disciplinarian, with knowledge of ratefixing and estimating essential. Excellent prospects. Staff Pension scheme. Apply, giving full details, age, experience, and salary required.—Box 1017, FOUNDRY TRADE JOURNAL.

TOOL Room FOREMAN wanted for large Aluminium Founders, Birmingham district, experienced in Die-sinking of Gravity and/or Pressure Die-casting Dies. Age 30/40 years. Capable of estimating hours required for die production from component drawings.—Apply, stating age, experience, and salary required, to the GENERAL MANAGER, Box 1010, FOUNDRY TRADE JOURNAL.

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NOTICE is hereby given that Magnesium Elektron, Limited, seeks leave to amend the Complete Specification of the Application for Letters Patent No. 532,143 for an invention entitled "Magnesium Base Alloys." Particulars of the proposed amendments were set forth in the Official Journal (Patents), No. 3252, dated 13th June, 1951.

Any person may give Notice of Opposition to the amendment by leaving Patents Form No. 36 at the Patent Office, 25, Southampton Buildings, London, W.C.2, on or before 13th July, 1951.

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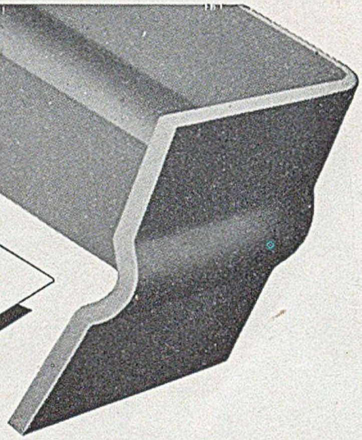

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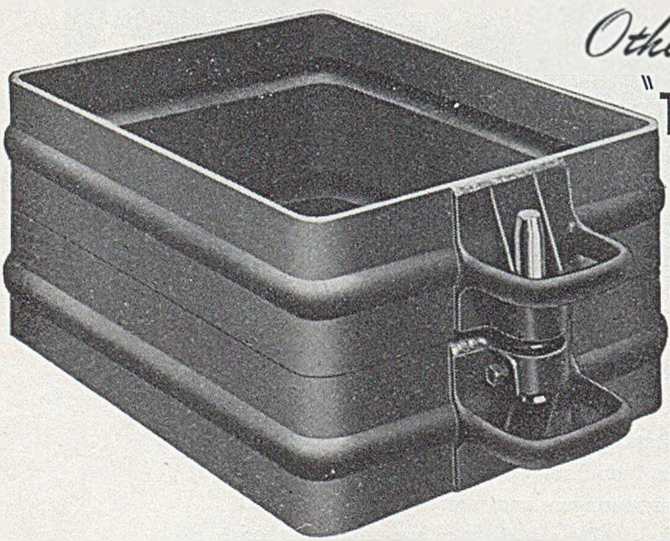

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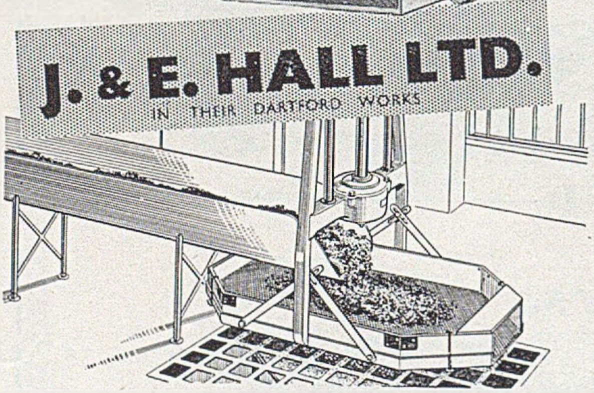
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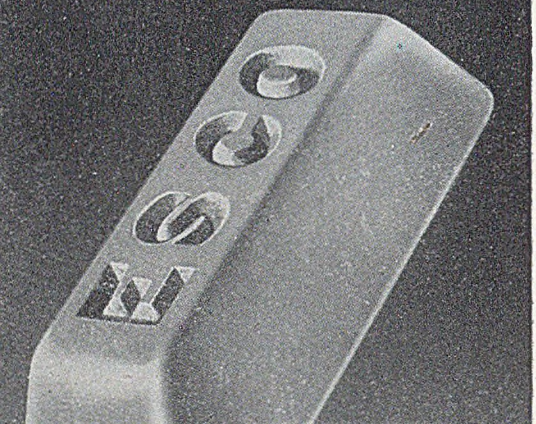
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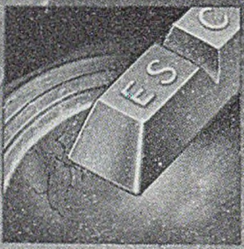
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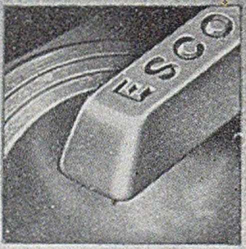
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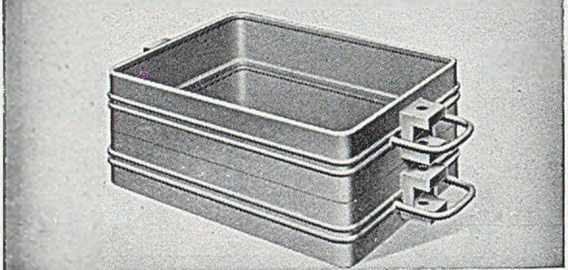

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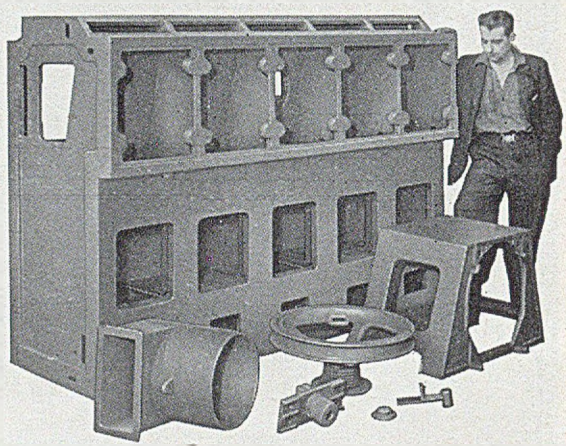

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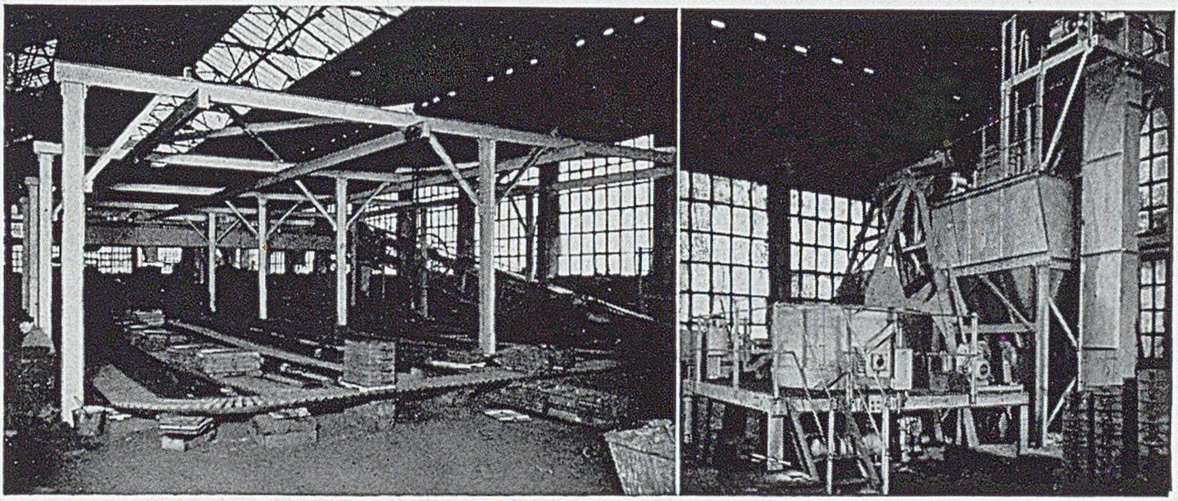

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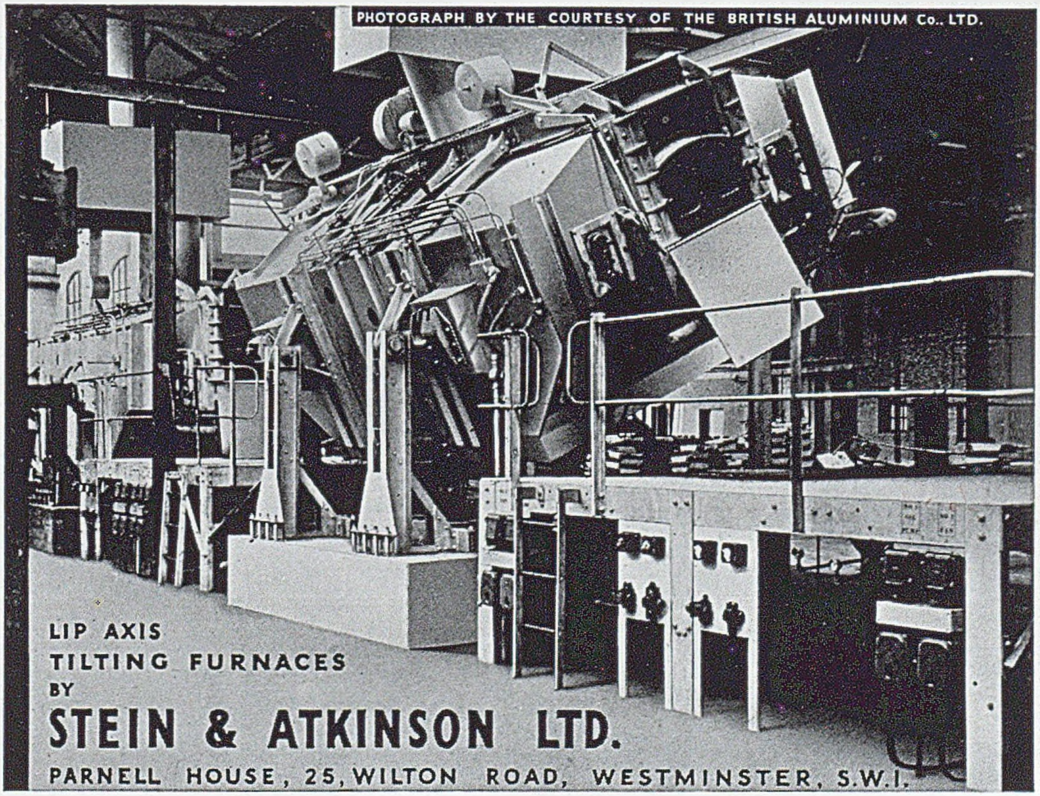

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