FOUNDRY TRADE JOURNAL

EST. 1902

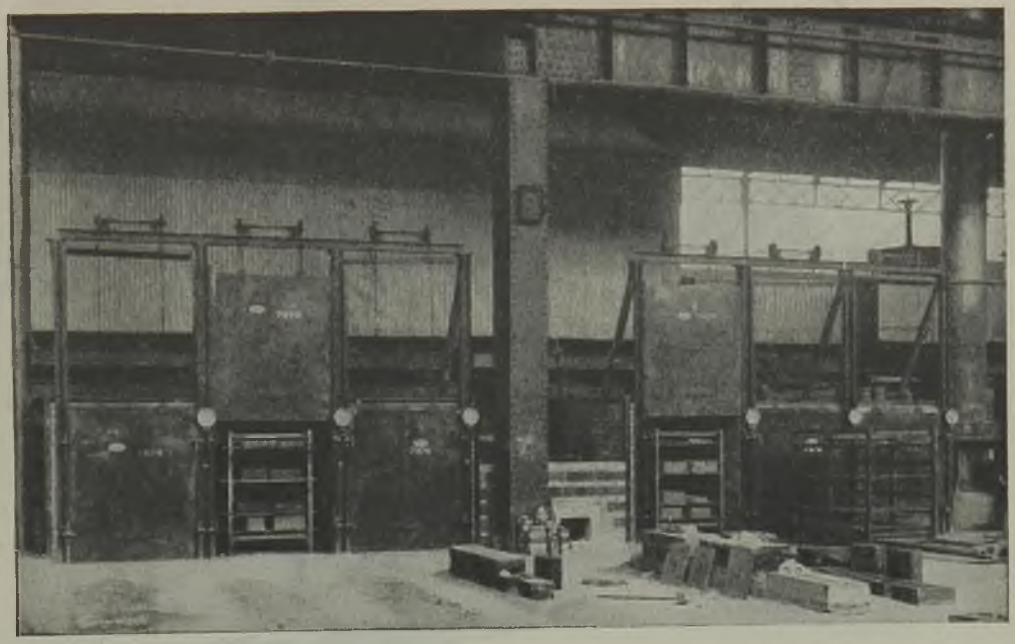
WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 73. No. 1451. JUNE 8, 1944

Registered at the G.P.O. as a Newspaper. Offices: 49, Wellington Street, Strand, London, W.C.2.

Single Copy 6d. By Post 8
Annual Subscription, Home and Overseas, 21/- (Prepaid)

The fact that goods made of raw materials in short supply owing to war conditions are advertised as an indication that they are necessarily available for export



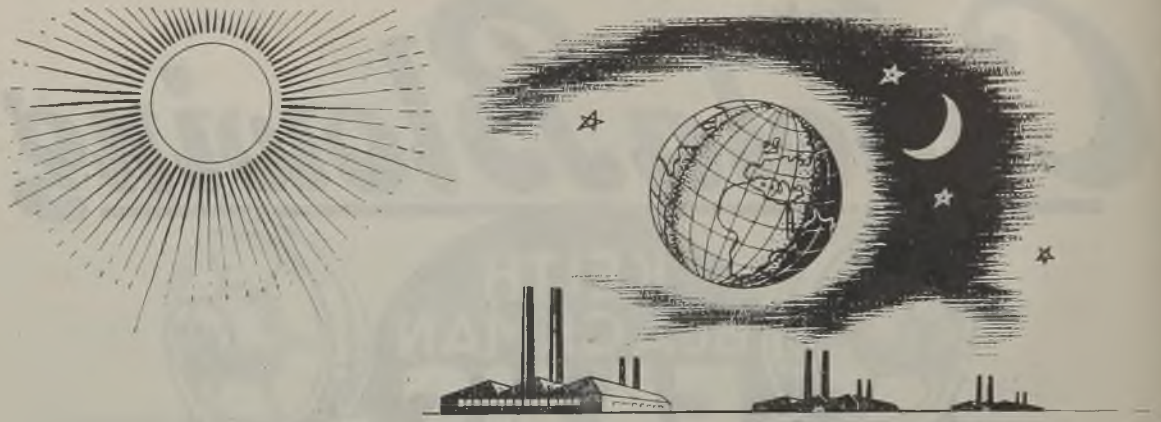
Pig in the raw

What with ores not being what they were and coke varying in quality, the lot of the pig iron manufacturer is apt to be hard. The sulphur demon is ever-present and tightening his hold : he must be even more sternly exorcised if you are to be proud of your pig. Sodium Carbonate is the great anti-sulphur agent. Operate your blast furnace for maximum output and desulphurise in the ladle with dense sodium carbonate. This is the modern method, proved far superior to the conservative procedure of keeping down sulphur content by using a large quantity of limestone in the furnace charge. Sir, do not let your pig run wild — consistent, better quality pig is so easy and so economical if you make use of the Sodium Carbonate process.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED

C.N. 1112



NON-STOP SERVICE . . .

Since the start of the war we have not stopped production of KORDEK products night or day, except for repairs and rest periods.

Mounting demands for our binders have all been met, transport difficulties overcome, and provision made against disturbances threatening our normal sources of supply. We are proud of this record which we wish to maintain, and it shall also be our endeavour to extend our service in the new directions in which KORDEK products are being employed.

KORDEK PRODUCTS FOR

OIL SAND · FACING SAND · GREEN SAND · DRYSAND · SKIN DRYING · LOAM FACING · CORE JOINTING · MOULD WASHES

ETC., ETC.

KORDEK — G.B KORDEK — G.B KORDOL

G. B. Kordek & G. B. Kordol are manufactured under British Letters Patent Nos. 515470, 543201

CORN PRODUCTS CO., LTD., 356-60 OXFORD STREET, LONDON, W.1

FOUNDRY TRADE JOURNAL *Established 1902*

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

49, Wellington Street, London, W.C.2.

WARTIME ADDRESS to which all communications should be sent :—
3, Amersham Road, HIGH WYCOMBE, Bucks.
'Grams : "Zacatecas, High Wycombe."
'Phone : HIGH WYCOMBE 1792 (3 lines).

PUBLISHED WEEKLY : 21s. per annum (Home and Overseas)

OFFICIAL ORGAN OF :

COUNCIL OF IRONFOUNDRY ASSOCIATIONS

Chairman : FitzHerbert Wright, The Butterley Company Ripley, near Derby. Secretary : V. Delport, 2, Caxton Street, Westminster, S.W.1.

Participating Associations : British Bath Manufacturers' Association ; British Ironfounders' Association ; British Malleable Tube Fittings Association; Cast Iron Axlebox Association ; Cast Iron Chair Association; Cast Iron Heating, Boiler and Radiator Manufacturers' Association; Cast Iron Segment Association ; Greensand Pipe Founders' Association of Scotland; Ironfounders' National Confederation ; National Association of Malleable Ironfounders ; National Ingot Mould Association ; National Ironfounding Employers' Federation Association of Automobile and Allied High Duty Ironfounders ; British Cast Iron Research Association (affiliated); British Coke Association (affiliated); Flushing Cistern Makers' Association (affiliated) ; Institute of British Foundrymen (affiliated).

INSTITUTE OF BRITISH FOUNDRYMEN

PRESIDENT, 1943-44 : D. Sharpe, Foundry Plant & Machinery, Ltd. 113 West Regent Street, Glasgow.

General Secretary : T. Makemson. Acting Secretary, J. Bolton, Saint John Street Chambers, Deansgate, Manchester 3.

BRANCHES

Birmingham, Coventry and West Midlands : A. A. Timmins, F.I.C., 33, Carters Lane, Quinton. Bristol and West of England : A. Hares, 20, Greenbank Road, Hanham, Bristol. E. Midlands : S. A. Horton "Three," Mostyn Avenue, Littleover, Derby. Lancs : H. Buckley, Ellesmere, Norfolk Avenue, Burnley. London : V. C. Faulkner, 3, Amersham Road, High Wycombe. Middlesbrough (pro tem.) : J. K. Smithson, North-Eastern Iron Refining Company, Limited, Stillington, Stockton-on-Tees. Newcastle-upon-Tyne : C. Lashly, Sir W. G. Armstrong, Whitworth & Co. (Ironfounders), Ltd., Close Works, Gateshead. Scottish : J. Bell, 60, St. Enoch Square, Glasgow. Sheffield : T. R. Walker, M.A., English Steel Corporation, Ltd., Sheffield. Wales and Monmouth : A. S. Wall, 14, Palace Avenue, Llandaff, Cardiff. West Riding of Yorkshire : Douglas Jepson, M.Sc., 9, Ambleside Avenue, Bradford. South Africa : B. P. Skok, Mutual Building, Johannesburg.

SECTIONS

Burnley : H. Buckley, Ellesmere, Norfolk Avenue, Burnley, Lancs. Cape Town : K. Zwanziger, P.O. Box 346, Cape Town, S. Africa. East Anglian : A. N. Sumner, 516, Norwich Road, Ipswich Falkirk : T. R. Goodwin, "Viewfield," Falkirk Road, Bonnybridge. Lincoln : E. R. Walter, Ph.D., The Technical College, Lincoln.

ASSOCIATION OF BRONZE AND BRASS FOUNDERS

President : H. Bissell, J. Stone & Co., Ltd., London. Secretaries : Heathcote & Coleman, 25, Bennetts Hill, Birmingham, 2

THE INSTITUTE OF VITREOUS ENAMELLERS

President : W. H. Whittle, W. H. Whittle, Limited, Eccles, near Manchester. Chairman : W. Todd, Parkinson Stove Co., Ltd., Stechford, Birmingham. Hon. Sec. : W. Thomas, A.I.C., Bank House, High Street, Rickmansworth, Herts.

FOUNDRY TRADES' EQUIPMENT AND SUPPLIES ASSOCIATION

President : G. E. France, August's, Limited, Thorn Tree Works, Halifax. Honorary Secretary : K. W. Bridges. Assistant Secretary : Miss L. Cox, 52, Surbiton Hill Park, Surbiton, Surrey.

WELSH ENGINEERS' AND FOUNDERS' ASSOCIATION

President : W. E. Clement, C.B.E., Morfa Foundry, New Dock, Llanelly. Secretary : J. D. D. Davis, 1, St. James Gardens, Swansea.

BRITISH CAST IRON RESEARCH ASSOCIATION

Alvechurch, Birmingham. 'Phone and 'Grams : Redditch 716.
Scottish Laboratories :—Foundry Technical Institute, Meek's Road, Falkirk. (Phone : 332)

FOUNDRY TRADE JOURNAL
Established 1902
WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

Vol. 73 Thursday, June 8, 1944 No. 1451

Buying and Selling

There is every reason to believe that the immediate post-war period will be characterised by an immediate demand for plant to replace that worn out by munitions production, to supply peacetime demands, and to renew machinery which in the light of modern knowledge has become obsolete. In no industry will this be more marked than that devoted to the manufacture of castings, for whilst half the foundries has been working at excessive pressure, the other half has been stagnating or working on exotic production; in either case the plant has deteriorated to a greater degree than if it had been working normally. Some foundry owners, crediting themselves with wisdom beyond the average, are envisaging retooling the shops by purchases from whatever will be the equivalent of last war's Disposal Board. No doubt, here and there, real bargains will be obtained, and successful bidders, like a man who pulls off a double on the Derby and the St. Leger, will tell an attractive story. The recounting of innumerable small losses on which bookmakers live, has no part in these histories. Likewise, the subject of continuously tinkering about with worn out machinery as a topic of conversation excites no interest!

The purchase of second-hand machinery is a gamble unless the buyer can give a positive answer to the following questions:—(1) Is the machine of really high efficiency? (2) Will the maintenance costs be negligible? (3) Was there a wealth of experience available to its designers and constructors? (4) Is it furnished with modern contraptions (push-button control, and the like)? (5) Is its potential production balanced with the rest of the plant? By answering in advance all these questions, it will usually be found that bespoke plant is superior to "off the peg." For instance, the purchase at a give-away price of the best 70-in. cupola on the market, where a cupolette would do the job, would render both the cupola and the floor it supplied totally inefficient. This simile, by the way, though an obvious exaggeration, does portray a set of conditions which we know to exist.

Mr. J. Stone, the president-designate of the Institute of Cost and Works Accountants, in a recent lecture to the London Branch of the Institute of British Foundrymen, pointed out that where a unified costing system had been applied to a group of firms or an industry, one concern would manufacture a line of goods cheaper than all the others. We suggest that this is the direct result of operating with a well-balanced plant. Stand-by machinery is not invariably a measure of prudence, but can be an easy method of camouflaging out-of-balance means of production. In as much as we have indicated a high standard to be applied to purchases, it is obvious that the same conditions should be applied to sales, so far as they are controlled by the foundry. As it is difficult to give an efficiency factor for castings, foundrymen must replace this by the provision of data as to the dimensional tolerances, chemical and physical properties, suitable machinery speeds, and, some time in the near future, where appropriate, the characterisation of the surface. Though "modernity" is difficult to apply to castings, it is easy to attach to selling policy. Where this has been in vogue for a period of years, the position of these firms is now so strong that they can impose an intelligently compiled questionnaire in respect to the inquiries received from potential buyers, much as is the case in the U.S.A. The effect is to give to the buyer an implied desire to meet his specifications on a proper businesslike basis. By applying an equally high standard to buying and to selling, there is provided an assurance of good progress in the difficult post-war years.

Contents

THE INSTITUTE OF BRITISH FOUNDRYMEN

ANNUAL MEETING AT MANCHESTER

The 41st annual general meeting of the Institute is being held at the Midland Hotel, Manchester, to-morrow and Saturday. The following programme has been arranged:—

Friday, June 9.

8 p.m., presentation and discussion of Papers No. 794, "Mechanical Handling in Foundries," by the Mechanical Development Sub-Committee of the Technical Committee, and No. 795, "Sandslinger Moulding Practice," by W. Y. Buchanan.

Saturday, June 10.

9.30 a.m., annual general meeting, induction of officers, and presentation of awards; 10.45 a.m., Presidential Address by Mr. John Gardom; 11.15 a.m., Edward Williams' Lecture, "Tolerances and Inaccuracies in Physics," by Sir Charles G. Darwin, K.B.E., M.C., M.A., Sc.D., F.R.S. (Director National Physical Laboratory); 1 p.m., luncheon; 2.15 p.m., presentation and discussion of Papers.

Session A: No. 796, "Steel Mixes and Inoculants in Grey Cast Iron," by W. Barnes and C. W. Hicks; No. 797, "The Development and Production of Inoculated Cast Iron," by H. P. Hughes and W. Spenceley; No. 798, "Wartime Developments in Whiteheart Malleable," by G. R. Webster; and No. 799, "The Speeds of Rotation in the Centrifugal Casting Process," by J. E. Hurst, D.Met., J.P.

Session B: No. 800, "The Control of Composition and Heat Treatment in 0.25 per cent. C. 1.5 per cent. Mn Steel Castings," by T. W. Ruffle; No. 801, "Relationship of Brinell Hardness and Yield Stress in Certain Cast Steels," by T. W. Ruffle; No. 802, "Modification by Heat Treatment of Cast Structures and Properties," by H. T. Angus, M.Sc., Ph.D.; and No. 803, "First Report on Basic Lined Cupolas," by the Melting Furnaces Sub-Committee.

Session C: No. 804, "Wartime calls on Women to make Aluminium Air-Cooled Cylinder Heads," by M. J. Gregory (factory manager, Foundry Division, Caterpillar Tractor Company) (American Foundrymen's Association Exchange Paper); and No. 805, "The Mechanised Production of Gravity Die Castings," by J. Vickers.

The American Society for Testing Materials is now including in the "A.S.M. Review" a new metallurgical abstracts section, thus filling a void left in American technical literature since the discontinuance of this service by "Metals and Alloys" in 1940.

The March-April edition of "Foundry Practice," the house organ of Foundry Services, Limited, Long Acre, Nechells, Birmingham, 7, contains three good articles on Monel metal castings, a non-stop cupola tilting spout; low carbon cupola melted cast iron, and the chalk test for aluminium castings. This is the best issue this concern has ever published.

COUNCIL OF IRONFOUNDRY ASSOCIATIONS

The Transport Advisory Panel of the C.F.A. have issued their first bulletin to firms that are members of a C.F.A. association. These bulletins, which will be circulated from time to time, contain information on problems relative to transport and insurance. They constitute a special service to C.F.A. members which, it is hoped, will be of real value to them. The members of the Panel wish to emphasise the fact that it is only by taking an interest in transport matters that foundry owners will achieve the best results in the field for the good of the industry, and by thus combining individual efforts they will substantially strengthen their position when dealing with the authorities and the large transport organisations.

Bulletin No. 1 includes information concerning Statutory Rule and Order, 1944, No. 497, dealing with Road Transport; advice on matters relative to railway transport, and a reference to Statutory Rule and Order No. 407 of 1944, "Emergency Powers (Defence) Canals." There is also some useful information about insurance of goods consigned by road under Government control. Firms that are members of a C.F.A. association are encouraged to make use of the Panel. All enquiries to be sent to the Secretary of the Council, 2, Caxton Street, London, S.W.1.

Questionnaire on Post-War Reconstruction

Many firms have not yet returned their answers to the questionnaire issued on April 28. It is to the interest of individual firms as well as to the interest of the industry that the maximum number of answers should be returned in order that the Government departments concerned may have as complete information as possible on the post-war requirements of the industry.

It is appreciated that many firms have to devote their time to many urgent matters, and it has been decided to extend the date for receiving the returns until June 30. However, it will help considerably if the replies are sent as soon as possible.

ASLIB SPECIAL LIBRARY COURSE

Aslib is organising a week's intensive emergency special library training course in London, in August, 1944. The syllabus for this course will be the same as for Aslib's ordinary twelve-week course, but these short courses cannot give anything like full instruction in library methods. They are intended rather as wartime emergency courses. The fee for the twelve lectures is five guineas. Anyone who is interested should write for further particulars and an enrolment form to the General Secretary, Aslib, 31, Museum Street, London, W.C.1.

The syllabus includes:—Introductory lecture on the use of general reference books; elementary cataloguing; basic principles of library routine; types of classification; practical bibliography; bibliographies; subject indexing; the technique of information services; channels of information; abstracting and abridging; and patent literature.

VIEWS ON FOUNDRY TRAINING*

Establishing a higher standard of craftsmanship

By R. F. COATES

INTRODUCTION

Plans for post-war reconstruction are now being formulated by authoritative bodies connected with practically every sphere of industrial and social activity. Under this heading, the foundry industry has on its agenda the important item of formulating proposals by which an adequate number of the various grades of personnel may be made available for the future. Whatever the sphere of activity, this provision of the human element is of paramount importance as far as continuity is concerned.

The foundry industry is jointly concerned with the other branches of engineering in the maintaining of the standard of craftsmanship and production which will be necessary on the return of normal economic conditions to recapture the prominent position this country held up to the outbreak of war in the world's markets of machinery and manufactured goods. Since the products of this industry are essential to practically every mechanical unit, besides the thousand and one forms in which castings contribute to the well-being of the community, it is obvious that the foundry industry has an important part to perform.

It is apparent, therefore, that to meet this obligation, the decline in the number of entries and of the standard of training, must not only be arrested, but efforts directed towards the raising of these to meet the possible needs of the future. This matter has been for some time, and still is, under examination by educational and industrial specialists connected with the industry. The main causes of the decline have been diagnosed, and recommendations for its remedy are being prescribed. Moreover, this problem has aroused considerable interest among the members of the foundry industry; it has found expression in a number of Papers, and the ensuing discussion. From these a source of valuable information is becoming available which should both encourage and assist in the developing of sound systems of foundry training.

There still remains, however, much work of preparation to be done, and the time now appears opportune for a further exchange of views upon schemes which may lend themselves to practical application. The field of the foundry industry is an extensive one, and comprises many types of foundries, each with its own class of work and methods of production. It therefore follows that a system of apprentice training suitable for one would be impracticable for another. Therefore, the wider the exchange of views on the problem the greater will be the extent of application.

It is with these thoughts in mind that this Paper has been prepared, and it is hoped that within its text there may exist a measure of value which may assist jointly with other contributions in establishing a higher standard of foundry training. It is only by so doing that the foundrymen of the future will become fully equipped craftsmen and technicians, equal to meet the demands the industry may make upon them. Furthermore, it is upon them that the responsibility will rest for continuing the progress of this industry, engaged in the art and craft of metal casting.

Recent Work

The subject of training foundry apprentices is one which has prompted considerable discussion during recent years. Papers given from time to time on this problem have voiced a feeling of concern within the industry regarding the future, and it is now generally agreed that, in order to increase the number of entries, some reform is necessary in the methods of training foundry apprentices. Since it can be said that the human element is one of the primary agents of production, it follows that the foundryman, be he executive or craftsman, has some influence upon the industry's progress. Any decline, either in number or of skill, sooner or later will have an adverse effect on the industry's advance.

It is therefore obvious that, in order that the foundry industry may continue the progress it has already made, a sufficient number of skilled craftsmen and technicians must be made available. The problem is now becoming an acute one, and this Institute, fully aware of the position, has published a Report[1] of the recommendations of its Education Committee, concerning the training of the young foundryman. This Report is both informative and encouraging, and furthermore it marks a definite step forward. Of the recommendations—one of the most important—is that of applying a systematic course of training in the foundry.

There are indications that with the wider application of the machine, and the extending of scientific control over the various phases of casting production, that an increasing number of technical assistants will be required. In addition, a number of suitable men will be needed to assume foundry control, particularly of those in which all, or a part of the work, is of such a nature that does not lend itself to mechanical production. Furthermore, the services of the skilled craftsman will also be in demand.

The training must therefore be a sound practical and technical one. For those who may be suitable to undertake technical and executive posts, some additional training in those departments where the work is closely related to that of the foundry is essential.

It is proposed to outline some principles that might be applied to the training of apprentices, and which may meet with the approval of the authoritative body, which may be set up to organise and develop the

* Paper presented to the East Anglian Section of the London Branch, Mr F. E. Tibbenham presiding.

Views on Foundry Training

operating of schemes. Education is defined as a systematic course of instruction. Since this is now considered the line that should be taken regarding foundry training, it follows that such should be conducted on educational lines.

The Report recommends that in the larger foundries the locating of the apprentices in a small shop, or in a suitable part of the main foundry during the early stages of training, presents some advantages. Such facilities will, of course, vary, and in some cases may present difficulties. It is a matter, however, which might be borne in mind when extensions and new layouts are under consideration. Involved in the forming of a plan of training are three main factors: the instructor, the training course, and its application.

Instructors

The efficient working of any scheme is to some extent dependent upon the one appointed to operate it. The Report emphasises the importance of selecting suitable men for the posts of instructors. The qualifications given are that they should be good and experienced craftsmen, should have had some technical training, a fair general education, and, above all, be capable of tactful, sympathetic, and firm dealing with the apprentices in their charge. To this it might be added that they should be of a reasonable age. It is at once apparent that such men are not in an abundant supply at the present time.

There are, in addition, difficulties during the present period of making such appointments. Employers and executives who desire to put a scheme into operation as soon as the circumstances permit could make some preparation now. Particularly if they have a suitable man available, the proposal can be put before him, together with a request that he should make some effort to prepare himself for the position of foundry instructor. Such action will assist in making an early start of the scheme as soon as the circumstances allow.

The post of instructor will by no means be an easy one, but those appointed can have no doubts that, by efficient work, they will be making a worth-while contribution to the industry's future. Moreover, to any craftsman so appointed, some degree of promotion will be offered. The supply of instructors for the technical schools is also important. With the coming into force of the Government's Education Reform Bill, which incorporates compulsory part-time education, a larger number of technical instructors will be needed.

The Report states that this matter is under consideration, and it promises assistance to those who may be prepared to undertake this work, by the issuing of lecture notes. The curriculum in the foundry technical school usually follows the syllabus of the City and Guilds of London Institute. This syllabus is an extensive one, and some of the subjects can with some advantage be taken by visiting lecturers who have special qualifications in various branches of foundry work. In connection with this course, there appears to be a need for suitable text-books, particularly for the beginner.

A Plan for Foundry Training

A course of systematic foundry training will involve the giving of such work and instruction, which will conform to a method of progress. Moreover, it is considered necessary for the adopting of some system whereby this can be effected.

All the departments of the foundry would be included, in order to give the widest scope to the training programme. This will naturally involve the transfer of the apprentice to different classes of work from time to time.

The organising of this, therefore, calls for some predetermined plan which would indicate the classes of work that make up the apprenticeship period, and of the time to be worked in each.

The drawing up of a timetable, shown in Fig. 1,

FIG. 1.—*Foundry Apprentices' Time Table.*

Stage.	Sect.	Class of Work.	Course.	
			Craft.	Tech.
			Months.	Months.
1	A	Coremaking ; small ..	3	3
2	B	Moulding ; small ..	3	3
3	C	Coremaking ; small ..	3	3
4	D	Moulding ; small ..	3	3
5	E	Moulding ; non-ferrous	6	6
6	F	Coremaking med. ; with man	9	6
7	G	Moulding med. ; with man	9	6
8	H	Coremaking med. ; alone	9	6
9	I	Moulding med. ; with man	9	6
10	J	Moulding and core-making med. ; alone..	9	6
11	K	Moulding large ; with man	9	6
12	L	Pattern making ..	—	6
13	M	Laboratory	—	9
14	N	Rate fixing and planning	—	3

gives some assistance in the forming of such a plan. For the purposes of this Paper, the apprenticeship period is shown as six years. While it will be noted that this covers a programme for two classes of apprentice, the technical course is included to act as an incentive to the more intelligent and ambitious lad who may enter the industry. It will be noted that each class follows the same course for the first two years.

By such time an apprentice may have shown, both from his practical work and from his report from the technical school, that with suitable training he may develop into a higher grade of foundry worker. He may therefore be recommended for transfer to the technical class at this, or even at a later, stage of

his apprenticeship. By this means encouragement will be given to that type of youth of which the industry is in need. Thus each apprentice will have the same opportunity to share in the advantages that this course offers.

It will be appreciated that it may not always be possible to make the transfer from one class of work to another at the appointed time. This will be largely influenced by the particular work being available as required. In such circumstances the transfer would be made as near to the time as the conditions permitted. The stage number and the section letters indicated on the time table would be used in connection with the Quarterly Record shown in Fig. 2. It is, of course, inadvisable that the instructor should be charged with any considerable clerical work, but in the application of a system some is essential.

FIG. 2.—*Foundry Apprentice's Quarterly Record.*

Sect. worked.	Name..... No. ..		Date ; Birth..... Date ; Started		
	1944.	Marks.		Course.	Stage.
	W/E.	Class of Work.	Discipline.	Remarks.	
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M	Test				
N	Aver.			Instructor :	

Foundry Manager's Comments :

Signed.....

This record gives the usual personal data, class of the apprentice, and the stage number of the period of training taken from the time table. The section letter indicating the class of work being done would be entered in the column so headed. The extra column allows for the event of any transfer made necessary during the period. At the end of each quarter, when the apprentice is working alone, a test would be given. This would be of such a nature that would indicate the knowledge the apprentice has acquired from the instruction given during the preceding weeks. When both coremaking and moulding stages have been worked, the test would involve both the making of the cores and mould. No instructions would be given in such tests.

The allocation of marks may appear to be an involved one. It is suggested that to facilitate this, a small card index be used indicating the shop number of each apprentice. As the work is issued, a slip bearing the usual details is filed. When the work is completed the mark awarded is written on the slip and refiled. The inspection of cores presents little difficulty, and an arrangement with the casting checker to pass on information when castings are ready for despatch would assist the instructor for the inspection of castings. The marks would be calculated on an average weekly basis for entering on the quarterly record. Jones, for instance, may complete ten orders in a week, as against only three by Smith. Therefore, while each order would receive a mark, the average reduces them to a common factor.

At the end of each week the foundry instructor would pass his card index to the foundry office, for the entering of the marks awarded. All slips bearing a mark would indicate that they are completed, and would therefore be removed from the file.

The instructor would then add to the record his own mark for discipline and any appropriate remarks. When the apprentice is working with a man, the marks awarded would be based upon the instructor's observations, and from information he would obtain from the man with whom the apprentice is working. It will be noted that the section letters are included on the left of the record.

These may be used to indicate the sections the apprentice has completed, by cancelling the appropriate letter on the following quarterly record, which will also serve as a reference in the event of it being necessary to work in more than one section during a period. In such circumstances the number of months worked in any one section could be inserted under the appropriate letter. By carrying this information forward each period an immediate reference is thereby provided concerning the sections completed, and of any time to be made up in others.

The value of such a record lies in the fact that it will give a fairly accurate account of the apprentice's work made at the time it is done, as well as taking into consideration all his work. Furthermore, it would be of considerable assistance to the management, both as regards the recommending of any transfers to the technical course and in the making of any awards. It will also serve as a basis for a reference should the

Views on Foundry Training

apprentice leave for employment elsewhere, during or after his apprenticeship. Perhaps not the least use for such a record is that of directing it into a line of propaganda, in so far that a periodic report could be sent to the apprentice's parents. It would be an indication to them that the lad is receiving an industrial training, conducted on educational lines, from employers interested in his progress.

Training the Apprentice

In future years the youth entering the foundry may do so better equipped for the industry than are those of the present. For the time being, however, it must be realised that when a lad enters the foundry to-day in most cases it is the first time that he views it from the inside. He finds himself in strange surroundings, and probably has no idea of what is done in this place so much in contrast with the classroom. The first few days are most important. He is making his first acquaintance with the industry, his instructor, and those with whom he is to work.

Every effort should be made by the instructor to create a good impression. A good beginning is all important. A tour round the shop, visiting the cupolas, sand plant, laboratory, moulds in various stages of production, etc., provides a suitable manner of introducing the beginner. The first day could be well spent in the newcomer mixing with and watching the other apprentices at work. As the opportunity presents itself, the instructor could point out the uses of various tools, etc., and some of the principles of foundry work. From the beginning as much a variety of work as possible should be given. The making of small cores, such as those which may be used by the moulding apprentices, will give the instructor a convenient opportunity of noting his early work.

The beginner should be encouraged to ask questions concerning anything which he may not fully understand. If the work is creditable, the instructor should let him know it, as well as to apply constructive criticism to any of his failings. As the period of core-making ends, it should if it can be so arranged that the apprentice should make the cores for his first job on the foundry floor. At the beginning of the first term of moulding the importance of tidiness and the discriminate use of tools should be stressed.

The instruction given in the early stages will have considerable influence upon the methods the apprentice will adopt as his experience grows. There will be ample opportunity for the alert instructor to supplement his practical teaching with interesting remarks from time to time. When issuing work, instructions regarding it should be followed by why it is necessary to run in a particular section or to mould in a particular way, etc. Drawings, too, on occasion may be consulted with advantage to point out sections, cored recesses, etc., in addition to the arousing of interest in the work, it will initiate the apprentice into the reading of workshop drawings.

When the apprentice has had about a year's experience, a tour through the works will add a new line of interest. He now knows a little about the making of castings, and probably less concerning any subsequent operations upon them or of the use to which they are finally put. The instructor, as guide, could find much to interest the individual. Castings the apprentice has made may be in the machine shop, and others on the finished product in the assembly department. Some of the works' offices would also be included, such as the drawing office, rate fixing, planning and progress, with comments on the relation of their work with that of the foundry. Periodic visits to the fettling shop will, of course, normally form a part of the foundry training. Here, too, the instructor can give appropriate remarks in recognition of good work or constructive criticism, as the occasion demands.

When the time is due for the working with men, some care is necessary in the selecting of suitable tradesmen. It is well for the instructor to realise at this juncture that, as the apprentice is now to take a share in larger work, he may be doing so with mixed feelings. He may be looking forward to doing something more important, and at the same time he may have a feeling that the man with whom he is to work may not want him around. In addition he may approach the larger work a little nervously, thinking that he may be responsible for something which may cause a casting to be scrapped. It is here that this sympathetic understanding of the individual expressed in appropriate words will do much to allay any fears, and to instil some confidence.

The completing of the craft course should have given the apprentice a varied experience, from which he should develop into a useful craftsman. The additional three stages of the technical course will provide such experience which will be invaluable to the potential technical man. The technical training is, as already stated, largely concerned in the expected developments from the Government's Education Bill. It is difficult to state exactly when this will come into operation. In the meantime, however, every effort should be made to induce the apprentices to attend the technical school. The effort must come from the authorities, as the demand will not come from the apprentices themselves. The foundry apprentice does not fully realise the importance of technical training until he has personally made contact with the matter.

This is of little use unless some effort is made to provide it by the authorities. It is therefore deemed worthy of note in connection with this that an Advisory Committee of this Section of the Institute, set up under the chairmanship of Mr. H. H. Shepperd, began work in collaboration with the local education authority some three years ago. The result of this work was the inauguration of a foundry school in Ipswich at the beginning of 1942, and, in spite of the difficult period, this school is still in operation.

This is an illustration of what can be done along these lines. It is interesting to note that, from conversation with foundry apprentices, although some ex-

press a desire to leave the industry as soon as the circumstances permit, they invariably show some interest when the present position, and of its consequent possibilities and opportunities, is pointed out to them. This emphasises the fact that, so long as they remain uninformed on these points, some will continue to leave the industry for what they believe to be a better job. The financial aspect also appears to be an important one. Although it is not an issue upon which discussion can here be raised, it is nevertheless one which may have to be considered.

Conclusions

Since an apprenticeship is a period of preparation for a life's work, does it not warrant some care in its planning and application, both from the industrial and social aspect? It is obvious that an organised plan of foundry training is now essential and seriously overdue. This is necessary in order to equip the foundry workers of the future with that degree of skill which the industry will demand of them. There may be some divergence of opinion concerning a beginning. Some may think that the results of applying a scheme to a small number of apprentices would not warrant the cost. Others may consider that the sooner plans are put into action, the sooner will the problem approach a solution.

The main issues are to provide an organised system of training and to induce more youths to enter the industry. The application of the former will assist in the solving of the latter problem. Any scheme will involve some expense, and a long view must be taken regarding it; in fact, it may be considered as an investment. The return will not be made for some time and, even when it comes, it will not show itself in actual figures. This dividend will be shown by a higher degree of skill in the craftsman, and a corresponding increase in the efficiency of the technician. It follows that the former will produce a quality product and the latter will apply economic methods of production in its manufacture. These are two very important factors which influence a foundry's yield.

Since the industry generally will benefit, it naturally follows that all should co-operate to bear a proportionate share. The Education Committee of this Institute already have the structural plans well in hand. The filling in of this framework depends upon the response of employers, executives, instructors, and the apprentices. Of these four classes of the human element concerned, the apprentices are the least informed, and, if every opportunity is taken to acquaint them with the facts and, furthermore, to organise their training, the Author considers that there will be few that will desire to leave the industry.

Regarding the obtaining of recruits, some excellent suggestions are made in a Paper[2] by Messrs. G. L. Harbach and J. R. Horton, in which they recommend making contact with the education authorities in order to advertise the industry by films, lectures, and the arranging of visits to suitable foundries.

It must, of course, be acknowledged that many companies have for a considerable time given this matter every consideration in the interests of both the apprentice and the industry generally; a more co-ordinated effort is, however, now necessary to achieve the desired results.

It is fully appreciated by the Author that some at least of the suggestions made may be considered impracticable. The reader will also appreciate that any plans prepared for the applying of a system of training may have to be modified in practice, and also in the light of existing circumstances.

Much has been previously written and discussed around this perplexing problem. Each line of thought has thrown new light upon its many aspects. These expressions have converged to a point which indicates the need for urgent action—a fact which the report stresses. Finally, the Author desires to acknowledge that the Institute's Report, frequently referred to, is mainly responsible for the preparation of this Paper, since it prompted some thought around this problem, from which emerged the ideas and opinions it has expressed.

DISCUSSION

The CHAIRMAN, in opening the discussion, said the initial problem lay not in the training of apprentices, but in the difficulty of finding apprentices to train. He considered that six years, as outlined by the lecturer, was too long and could be substantially reduced. Regarding the plan of training itself, he felt that any such plan must essentially be kept alive and free from dullness to prevent boredom and lack of enthusiasm in the apprentice after the first year or so.

MR. L. DAVEY said that, as he considered a great deal was to be learnt on the charging platform, he was surprised to see from Fig. 1 no indication that any cupola practice was included in the training period.

MR. COATES, in reply, said that he had in mind that, as invariably control of the cupolas came under the authority of the laboratory, this section would include a period of cupola practice training.

MR. D. CARRICK asked whether the schedule of core making and moulding would include machine moulding and core making.

MR. COATES, in reply, emphasised that the schedule outlined in his Paper was drawn up to suit the conditions existing in the foundry with which he was concerned, and that, as each foundry had its own system of mould and core production, they could incorporate in the scheme the requisite training to meet those conditions, so that at the expiration of the period of apprenticeship the man was skilled in all phases of foundry processing, but particularly so in that relating to the foundry in which he received his training.

Type of Instructor Sought

MR. J. GOYMOUR asked the lecturer what he had in mind when he said that the instructor should be of a reasonable age. He himself felt that it was incumbent on employers to make, as part of appren-

Views on Foundry Training

ticeship agreement, compulsory attendance at technical schools, etc., and, in view of the fact that it was eventually necessary for all students to pass final written examinations, he considered that during technical training English should be included in the course, as to-day numbers of students were handicapped in examinations through lack of training in this subject.

MR. COATES replied that even if a man of 60 years was a first-class craftsman, he was too old to be an instructor. He had in mind men of 35 to 45 years who were up to date and in a better position to give instruction more clearly, while, furthermore, having a greater appeal to the students than a man having a much greater disparity of years between himself and the apprentices. He fully concurred with the suggested inclusion of English as a subject during technical training, as he, and no doubt Mr. Sumner as a technical instructor, had experienced that the majority of examination papers showed weakness in that direction. The new Education Bill would perhaps cure this before school-leaving age. At the moment employers could not compel attendance at technical classes, but a large number, however, did all they could, by awarding prizes, repaying fees, etc., to induce apprentices to do so.

MR. A. F. HAMMOND was of the opinion that the drift towards more and still more mechanised casting production was the real cause of the shortage of craftsmen.

MR. COATES replied that, although he considered excellent opportunities still plentiful to-day, he thought that mechanisation had certainly created an impression that it had lowered the status of craftsmanship, causing the older skilled men to advise their sons to keep out of the foundry. He felt that, if care was taken in choosing the man in whose hands the training of the apprentice would lie, much would be done to overcome this. The "What-did-you-come-into-the-foundry-for" attitude caused untold harm.

MR. HAMMOND believed that craftsmen now only performed whatever machines could not do, and that this had largely killed enthusiasm in the trade, with the result that the few men of the type wanted who were now coming forward in the trade were all looking for executive positions, leaving the bulk of the personnel as production "sloggers," and, in his opinion, ruining craftsmanship.

MR. COATES, although in sympathy with Mr. Hammond's opinion, thought that if children received improved elementary education and carried it on into industry, headway would be made, and a lot of the "slogging" would be taken out. This, coupled with "good housekeeping," would perhaps make the foundry a better place to work in.

MR. L. W. SANDERS asked if Mr. Coates expected that one instructor would instruct for the six years throughout all the phases of the scheme.

MR. COATES, in reply, said that he meant that each department would have an apprentice instructor, who would train the youth in that particular job, before handing him on to the next specialised instructor.

Assessing Progress

MR. C. H. KAIN remarked that everyone was building a great deal on the new Education Bill. He would like to issue a word of warning, as he himself felt that there were great dangers attached to it, inasmuch as the outcome might well be the replacing of the status of wealth by that of intellect, which would form a breach just as dangerous as were existing social differences. Too much importance was attached to examinations, and he felt that the awarding of points should be given on a general performance and ability basis, rather than by examination. He considered that Mr. Coates's point on awarding marks on completing an order was wrong, and that they should be awarded independant of competition and financial inducement. He himself felt that there was nothing to worry about more in the foundry than in any other industry as regards the shortage of apprentices, as this shortage was general in all phases of engineering activity, and was largely due to control of the old educational system with its academic bias. Contrary to some opinion, he thought that the number of sons "following in father's industrial footsteps" was greater in the foundry industry than in any other he knew, and he also believed that if we cultivated the fascination which attends a youth's first sight and knowledge of the foundry, this would be maintained.

MR. COATES, in reply, said that regarding the awarding of marks, he looked upon this as an indication of the progress made rather than anything else, and a measure to allow regrading of the apprentice is necessary. As far as piece-work was concerned, in a recent written contribution to a discussion, he had emphasised his disapproval of any such scheme, suggesting a bonus scheme according to the class of work as a more suitable encouragement.

MR. DAVEY considered that a specialised training covering a much shorter period than suggested would be suitable for apprentices attached to a mechanised foundry.

MR. GOYMOUR was curious to know how this would apply to a 100 per cent. mechanised foundry, as he considered that if in future the bulk of castings would be made by a highly mechanised system, training in craftsmanship would not be necessary, and therefore technical training should be the major activity.

MR. COATES referred to his previous statement that each foundry must draw its own plan of training according to its class of work and its methods of production, but he felt that craftsmen would always be required to make castings, particularly large castings, which could not be mechanically produced.

MR. CARRICK suggested that in the fully mechanised foundry all the fundamentals would have to be known, but more mechanical training, teaching the principles involved in design and the servicing of all equipment, would be necessary.

MR. COATES, in taking a hypothetical case of 10 lads serving a foundry apprenticeship, said that in the

(*Continued on page* 116, *col.* 2.)

MOULDING SANDS AND GASES IN RELATION TO CASTING DEFECTS

Controlling factors in the satisfactory production of iron castings

By G. W. NICHOLLS

(*Continued from page* 91.)

Flowability

Up to now some of the main properties of moulding sands have been discussed, and if the sand delivered to the foundry is in good condition, it is now dependent on the skill of the moulder and the manner and degree in which he rams or the amount of jolting it receives on the machine, for the development of the required final physical properties for withstanding the thermal shock of high temperature necessary to produce sand castings free from surface defects. Naturally, the jolt machine will tend to ram harder than the moulder, but by using a sand approaching the weaker side of the proved workable range and the moulder ramming just a little harder, both should produce a mould of a similar hardness.

This point is governed by the flowability characteristic of the sand, which in turn is controlled by such factors as clay content, moisture, and grain size. Under the same conditions of ramming, a heavily bonded sand will not produce as hard a mould face as a moderately bonded sand, owing to the greater frictional resistance offered to the movement of the grains by the clay content. This in turn governs the final mould hardness, which is a very important factor in causing defective castings, *i.e.*, low hardness tends to produce swells, cuts, and dirt, whilst the high hardness tends to produce scabs and buckles.

More Typical Defects

Fig. 11 shows a casting defect caused by low mould hardness; the sand was in its correct condition, but was too softly rammed, with the result that the metal streams caused a cutting action on the mould face. Two ingates were used at opposite corners of a sloping face and, where the two met, a scab has occurred owing to the turbulent action created by the metal stream.

Fig. 12 illustrates a surface defect comprising a blind scab, solid scab and a buckle, *i.e.*, rat tail. In this case the sand was rammed too hard and the use of the vent wire was omitted, resulting in high expansion and poor permeability. No matter how much care the moulder may take in the production of the mould (*i.e.*, in its construction, using uniform degree of ramming to ensure freedom from hard spots), this will be offset if the moulding tackle is of poor design and little attention is paid to artificial venting (*i.e.*, by the use of coke breeze) or to securing rigidity of vent connections, or the use of the vent wire in producing channels from near the mould face to the atmosphere.

Fig. 13 shows a portion of a casting which misran. The construction of the mould used included two large cores, one of which was totally enclosed by molten metal and could only be vented by means of a connecting pipe into the second core. Owing to this pipe not being rigidly connected and to the lack of sufficient coke breeze in the second core, a high gas pressure was developed which held back the metal stream. In this case, even if the metal had eventually filled the mould cavity, the casting would have been mechanically weak owing to the presence of gas seams which are shown on the fracture.

FIG. 11.—DEFECT CAUSED BY SOFT RAMMING.

Defects from Gas Evolution

The rapid evolution of gas developed inside the mould cavity during casting must find an outlet, and whilst that gas above the metal surface is expelled largely through the risers and joint of the mould, that produced from the sand below the metal line must find its way through the natural vents of the sand. Therefore, in theory, the backing sand should be made from a coarse type of sand of greater permeability than that of the facing sand, so that as the gas penetrates further into the mould, it encounters less resistance to its flow. This is not practical, however, and

Moulding Sands and Gases

artificial means should always be provided. The use of a number of holes drilled in the bottom of the mould box, as shown in Fig. 14, and which now seems to be a common American practice, supplemented by the use of a vent rod in a vertical manner around the mould cavity and approximately 2 to 3 in. away from the face of the mould, as shown in Fig. 15, are undoubtedly sound methods in reducing the chances of becoming trapped in the mould cavity and resulting in blowholes. These methods are not a cure for dealing with steam produced by the use of excessive moisture. Excessive moisture produces expanding steam at a semi-explosive rate.

FIG. 12.—DEFECT CAUSED BY TOO HARD RAMMING.

FIG. 13.—DEFECT CAUSED BY FAULTY VENT CONNECTION.

FIG. 14.—VENT HOLES IN MOULD BOX.

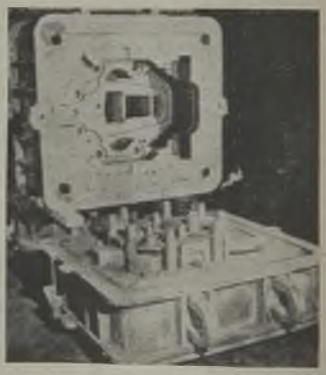


FIG. 15.—SOUND VENTING PRACTICE.

Excess Moisture

For every unit volume of excess water present, 1,700 vols. of steam are formed at 100 deg. C., and this rapidly expands with rising temperature to approximately five times this volume at 1,200 deg. C. This rapid expansion invariably damages the mould face, resulting in the scabbing or buckles. Fig. 16 illustrates this type of defect. This was produced by the excessive use of moisture. If the pressure of steam generated is not high enough to rupture the mould face, the casting will usually reveal, on machining, blowhole defects illustrated by Fig. 17.

This also applies to any dry-sand work incompletely dried, and in this class of moulding it is a great mistake to attempt drying the mould without promoting air circulation inside the mould cavity. Far more efficient drying can be obtained by circulating air at 110 deg. C. than stationary air at, say, 200 deg. C., and Fig. 18 shows what is considered good practice and poor practice. In the latter case, air inside the mould cavity is tending to become saturated with water vapour, which, escaping at a slow rate, does not aid in removing the moisture beneath the surface of the mould facing, with the result that, on coring-up, condensation or strike back can occur, particularly on any undercutting portions and in ingates, whereas in the former case the rapidly circulating air conducts the moisture from the mould cavity, and efficient drying is obtained.

Coring-up Moulds

A further point on this question of drying applies to both the cores and the mould, *i.e.*, attempting to core-up a mould with hot cores into a cold mould or *vice versa*. If drying of the hot core or mould has been incomplete, this invariably produces a layer of

condensed moisture on the colder face; a similar condensation occurs if the mould or cores are rapidly dried, producing a good dry outer skin, but wet in the interior. If the coring-up of the mould is carried out with both mould and cores hot and allowed to cool before casting, a layer of moisture forms on the porous surface of the mould or core face. This is brought about when the temperature of the surface

FIG. 16.—DEFECT CAUSED BY EXCESSIVE MOISTURE.

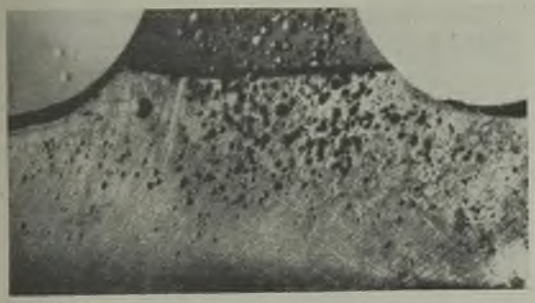


FIG. 17.—BLOWHOLE DEFECTS CAUSED BY EXCESSIVE MOISTURE.

layers of sand falls to a value below that of the interior of the mass. Under these conditions water vapour in the interior diffuses towards the surface and condenses at the face and, naturally, if cast in this condition, may produce blowhole defects or a possible flaking of the mould or core wash (Fig. 19). If the dampness accumulates in the runner or if a green damp sand runner bush is used, the first metal passing through these portions will tend to boil, creating steam and chilling a small amount of metal in the form of small shot, this steam and shot together with loose sand being carried into the mould, where they are usually trapped at the extreme end from the runner. This was found to be the case in the defects shown in Fig. 20, the rest of the casting being perfect.

Not only is good air circulation desirable for mould drying, but also uniform rate of temperature rise. Any

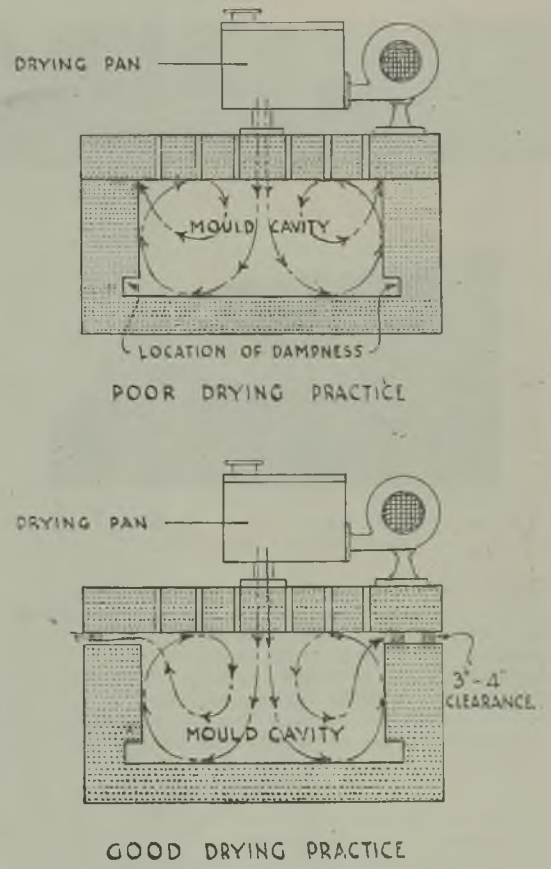


FIG. 18.—ARRANGEMENT ENSURING FREEDOM FROM DAMP AREAS WHEN USING PORTABLE DRYERS.

tendency to dry with a rapid temperature rise may cause cracking of the mould facing, producing fins which are undoubtedly detrimental on those castings required free from blemishes.

Classification of Defects

Having illustrated some of the defects attributed to sand condition and gas, an attempt has been made in Table I to classify the main defects which arise from

Moulding Sands and Gases

one or more of the physical conditions of the mould sand being out of balance. The defects are tabulated under the condition or conditions of the sand most likely to be responsible for that defect; for example, a scab may be caused by low permeability or high moisture content, but this low permeability may not be the direct cause, as too high a moisture content invariably lowers the permeability and too high a ramming intensity leads to increased hardness, low permeability and increased expansion. Therefore, the reduction of defective castings attributed to any one of these conditions can be achieved by anyone capable of determining the cause, provided that person has a full knowledge of the moulding sand condition, such as is obtained by daily routine tests.

FIG. 19.—DEFECT CAUSED BY MOULD AND CORE WASH.

FIG. 20.—METAL SHOT LOOSE SAND CAUSED BY DAMPNESS IN RUNNER BUSH.

Defects and Remedies

In concluding, it is proposed to summarise these defects and to give suggested curative remedies.

(1) *Blowholes.*—These are of two types, those produced by excessive use of organic binder in cores or too high a proportion of coal dust in the sand, and those due to high moisture content of the sand, or where the amounts of these ingredients are correct, but the permeability of the sand or core is low. In the latter case a highly permeable core can also produce this defect through back flow of gas. The defects can also be caused by lack or incorrect placing of artificial vents. By careful examination of the appearance of the holes and knowing the condition of the sand, the remedies are obvious, *i.e.*, if low permeability is the cause, open up the sand by use of new virgin sand, or check the mould hardness and, if too high, reduce the ramming intensity, which will automatically increase the permeability.

(2) *Cold Shuts, Misruns, Gas Seams.*—These defects are closely related to each other and are indicated by patches showing incomplete knitting of the metal. The responsible mould conditions likely to produce these defects are high gas evolution restricting the normal flow of metal in the mould cavity to such an extent that the metal either solidifies or, when met by the opposite oncoming stream, is in such a pasty condition that it fails to knit completely. They can also

(*Continued on page* 116, *col.* 1.)

TABLE I.—*Classification of Main Casting Defects Attributed to Sand Conditions and Gas. Moulding Sand Properties.*

Moisture.		Organic content.		Green strength.		Dry strength.		Permeability.		Expansion.	Mould hardness.	
Too high	Too low	Too high	Too low	Too high	Too low	Too high	Too low	Too high	Too low	Too high	Too high	Too low
Probable Defects.												
Blow-holes Scabs Buckles Rough-ness	Cuts Washes Drops Dirt	Blow-holes Cold-shuts Gas-seams Rough-ness	Rough-ness	Scabs Buckles Blow-holes	Washes Cuts	Scabs Buckles	Cuts Washes	Blow-holes Rough-ness	Blow-holes Cold-shuts Gas-seams Scabs Buckles	Scabs Buckles	Blow-holes Cold-shuts Gas-seams Scabs Buckles	Cuts Washes Drops Swells Rough-ness

MOULDING SANDS AND GASES IN RELATION TO CASTING DEFECTS

(*Continued from page* 114.)

be produced by poor venting, low permeability and high mould hardness, either of these, or a combination of these, restricting the escape of the normal gas evolved. The appearance of the defects may vary according to the condition of metal flow and the time lag involved in the two metal streams meeting, but usually they are distinguished from ordinary cracks by the surfaces being smooth and shiny. The remedies to adopt are similar to those given under the heading "Blowholes."

(3) *Cuts, Washer and Drops.*—These are indicated by the presence of rough depressions on the castings, or rough patches of metal protruding from the surface, often occurring in the direct line of metal flow. They are caused by poor green or dry strength of the sand, low moisture content or soft ramming. If the strength be not at fault, they may be caused by low moisture contents or soft ramming. Ascertain the true cause by sand tests and adjust accordingly.

(4) *Scabs and Buckles.*—Scabs can assume two or three different forms, such as a solid scab, in which case a second sand inclusion defect will be found on some other part of the casting on the opposite metal face, a blind scab closely related to the solid, but in which the sand has not reached the same degree of rupture, or a cut scab formed by the erosive action of the metal on a mechanically weak sand. The first is associated with a high gas pressure generated below the facing forcing off a patch of sand, and the second is due to the sand reaching a high expansion sufficient to buckle the sand surface, or by the generation of a gas pressure beneath the surface sufficient to give the same defect without completely rupturing the mould face. The general conditions of the sand mostly responsible are low permeability, high moisture, hard ramming and high strength or low coal dust, all of which can be ascertained by sand tests. The low permeability may be caused by too high a silt or clay content, or to too high a moisture and hard ramming, in which case open up the sand, reduce the clay bond or moisture content or adjust ramming intensity. High expansion may be caused by low coal-dust content or hard ramming.

Conclusion

Good sand condition scientifically controlled is an insurance against defective castings provided other factors, such as metal condition and method of running, are in order.

THE SUFFOLK IRON FOUNDRY (1920), LIMITED, of Stowmarket, has issued a data sheet for welders printed on stiff cardboard. The colours given for various high temperatures, whilst of a standard character, are never reliable, owing to the variation in room lighting conditions, and should now be discarded as they are no longer helpful. The tables directly concerned with welding are undoubtedly most useful.

IRONFOUNDRY FUEL NEWS—VI

The superintendent of an ironfoundry in Birmingham has reported to the Ironfounding Industry Fuel Committee how he has saved 36 per cent. of the coke used by his vertical, continuous core stove, and also about 5 man-hours per day. The operating temperature of the stove is 450 deg. F. (230 deg. C.) and the trays make a complete circuit in 1½ hrs. All coke used by the stove is weighed and a daily record is kept of the times of lighting and shutting down. For many years the practice was to light the stove at about 7.15 a.m., and shut it down at 6 p.m. to 7 p.m. Two men fired, loaded and unloaded, remaining with the stove all day.

Under the new arrangement the trays are set in motion at 7.30 a.m., but the stove is not lighted. One man only then unloads dried cores from the previous day and loads green cores, the trays continuing to circulate until they are almost full of green cores. The stove is then lighted, the time being 10.30 a.m. to 12 noon, according to the load. Another man joins in about 2 hrs. later, and the two of them continue to load and unload for the rest of the day. The records of coke consumption which were kept showed that the weight of coke required per hour to maintain a satisfactory drying temperature was almost constant, whether the stove was full of cores or not. Consequently, the method of filling the stove completely before lighting up, with the accompanying average reduction in firing time from 11 hrs. to 7 hrs. per day, resulted in a reduction of fuel in direct proportion, *i.e.*, 36 per cent.

VIEWS ON FOUNDRY TRAINING

(*Continued from page* 110.)

jobbing foundry nine would be craftsmen and one a technician, while in the fully mechanised plant, one would be a craftsman and nine technicians. Other foundries neither quite jobbing nor fully mechanised would have to adjust the ratio to suit their demands.

MR. D. MCINNES remarked that a skilled moulder of the past was a hard worker, and he thought that surely in future, even with the mechanical aids available, he would still be a skilled machine moulder. He failed to see that ramming a mould by hand compared to ramming by Sandslinger or other mechanical means, made all the difference between a skilled and unskilled man.

MR. CARRICK, in proposing a vote of thanks to the lecturer, thanked him for a good Paper, and one which had promoted a lively discussion. The meeting cordially responded.

REFERENCES

[1] The Education Committee of the Institute of British Foundrymen. Report and Recommendations on "The Education and the Workshop Training of Young Foundrymen."

[2] G. L. Harbach and J. R. Horton. "Industry and Education." Paper presented to the Annual Conference of the Institute of British Foundrymen, June, 1943.

NEWS IN BRIEF

SIR JOHN ANDERSON is being asked to receive a T.U.C. deputation which will seek fuller information as to the Government's decision to allow the cost-of-living index figure to rise five points and the implications in respect of wage increases.

BRISTOL is making noteworthy progress in the creation of facilities for the teaching of foundry practice. Pioneer efforts made by the local branch of the Institute of British Foundrymen are having the close collaboration of the Educational Authorities and the West of England Ironfounders' Association.

MR. OLIVER LYTTELTON, Minister of Production, speaking at Cambridge, said that if we were to maintain the standard of life it was necessary to increase our exports by about 50 per cent. above the pre-war level. It was a formidable task. The problem could only be solved by private enterprise, and the Government's task must be to give support in the difficult transitional period.

TWO NEW FACTORIES for Lanarkshire, which will provide employment ultimately for 1,600 women and 200 men, and a score of expansion schemes calling for 3,500 female and 1,000 male workers, were approved or supported by the Regional Board for Scotland during April. Plant valued at £87,000 and new buildings costing £98,000 were mentioned in connection with the new projects. Programme cuts intimated to the Board during the month affected more than 600 workers. Expansion schemes in Lanarkshire, additional to the two new factories, will absorb 1,500 workers. The other expansion schemes will mean employment for 1,900 more in the Glasgow area, 400 in the Edinburgh district, 300 in Renfrewshire, 300 in Fife, and smaller numbers in Angus and in the Falkirk area. The new plant and building schemes approved cover premises in Lanarkshire (£63,000), Renfrewshire (£53,000), Edinburgh (£30,000), Aberdeen (£20,000), and Fife (£18,750).

PERSONAL

MR. J. SHAW, a director of John Smith & Company (Derby), Limited, engineers, has celebrated his 50th anniversary with the firm, which he joined in 1894.

MR. F. V. THOMPSON has been appointed secretary of British Insulated Cables, Limited. He was formerly secretary of the Imperial Smelting Corporation, Limited.

MR. J. W. THOMAS has been appointed secretary of the British Engineers' Association in succession to Mr. H. E. Jones, whose services continue to be available to the B.E.A.

SIR FREDERICK J. WEST, chairman of West's Gas Improvement Company, Limited, has been appointed vice-chairman of the Iron Trades Employers' Insurance Association.

MR. A. B. PITCHER, chief accountant, has been appointed secretary of the Imperial Smelting Corporation, Limited, in place of Mr. F. V. Thomson. Mr. Pitcher retains the office of chief accountant.

OBITUARY

MR. E. A. RADFORD, M.P. for the Rusholme Division of Manchester, died at his home at Wilmslow, Cheshire, on May 27, aged 63. He was a director of Crossley Bros., Limited, of Openshaw, among other companies.

MR. DAVID WYLIE GAIRNS, chairman of the Grangemouth Dockyard Company, Limited, has died at the age of 66. A native of Glasgow, he began his career in shipbuilding in 1904, when he entered the service of the Greenock & Grangemouth Dockyard Company at Greenock. He became secretary there in 1912. In 1923, he was transferred to the Grangemouth yard, where he took up the position of secretary, and was also made a director of the firm. Following the death of Mr. S. P. Jackson in May of last year, Mr. Gairns was appointed chairman of the company.

IRON TRADES EMPLOYERS' INSURANCE ASSOCIATION

Premium income (less re-insurance) of the Iron Trades Employers' Insurance Association amounted to £3,799,238 in 1943, which, with £115,865 dividends, interest and rents, made the total receipts £3,915,103. The surplus for the year is £943,185, to which has to be added the balance brought forward from last year, £37,773, making a total of £980,958. The directors recommend that a return of 25 per cent. of the workmen's Compensation Premium paid for 1943 be made to the policy holders. The premium income of £3,799,238 was an increase over 1942 of £256,753, due almost entirely to higher wages rolls. So far 1943 is the peak year in the history of the Association.

F.B.I. AND INDUSTRIAL RESEARCH

The Federation of British Industries has decided to strengthen its organisation on the research side by making the Industrial Research Committee a permanent Standing Committee of the Federation with its own fully-qualified secretariat.

The Federation, while not itself engaging in research will, through the work of its Standing Committee, do all in its power—in collaboration with existing organisations in this field—to promote the interests of industry in relation to research and its application. At the same time, it will make every possible effort to secure the success of any wider or more comprehensive organisation which may result from the present widespread interest in the problem of research.

MR. FREDERICK CRESSWELL PYMAN, vice-chairman of the Iron Trades Employers' Insurance Association, Limited, since March, 1941, has been appointed chairman of the Association in succession to the late Sir Frederick N. Henderson. Mr. Pyman is managing director of William Gray & Company, Limited, chairman of the Mercantile Dry Dock Company, Limited, and director of other companies.

COMPANY RESULTS

(Figures for previous year in brackets)

Sanbra—Interim dividend of 5% (same).

Park Gate Iron & Steel—Dividend of 4% (same).

Jury Holloware (Stevens)—Dividend of 10% (same).

Sheffield Steel Products—Ordinary dividend of 7½% (same).

Siemens Bros. & Company—Dividend of 7½% (same).

R. A. Lister—Interim dividend of 5% on the ordinary shares (same).

Barrow Hematite Steel Company—Ordinary dividend of 7½% (5%).

Cochran & Company, Annan—Interim dividend of 1½%, free of tax (same).

Crompton Parkinson—Interim dividend on the ordinary and "A" ordinary stock of 7½% (same).

Hopkinsons—Net profit, after providing for taxation, £74,043 (£62,598); final dividend of 12½%, making 17½% (same).

Romac Industries—Profit to September 30 last, £22,311 (£44,452); taxation, £15,755 (£35,387); general reserve, £1,500 (£4,000); dividend of 7½%, with bonus of 2½%, making 10% (same); forward, £833 (£677).

North British Locomotive Company—Profit for 1943, after £30,000 (£35,000) for depreciation, £203,891 (£228,349); provision for taxation, £120,000 (£150,000); ordinary dividend of 5% (3%); to reserve, £25,000 (£50,000); forward, £59,037 (£50,146).

W. T. Henleys Telegraph Works—Net profit, after tax, £354,566 (£331,379); to war contingencies reserve, £50,000 (same); special depreciation and obsolescence, £13,247 (nil); to pension fund, £10,000 (nil); final dividend of 10% and a cash bonus of 5%, making 20% (same); forward, £402,475 (£390,156).

Parkinson & Cowan—Profit for 1943, after making provision for debenture service (£11,508), taxation, depreciation, etc., £52,324 (£48,423); preference dividend, less tax, £16,937; applied in reducing book value of investment in Australian subsidiaries, £8,000; to reserve, £10,000; ordinary dividend of 5%, less tax, £18,147 (same); forward, £31,934 (£32,694).

Peeling of Chromium Coatings

Chromium and nickel coatings do not peel off if, immediately after the copper undercoat has been deposited, the articles are transferred to a nickel bath, states J. L. WERZMANN in the Russian journal "Corrosion." If the copper surface is exposed to the air for a time, it becomes covered with a film which cannot be wetted by water, and which prevents the adhesion of the nickel to the copper, even after pickling with KCl. Transfer to the final plating bath should therefore be made as quickly as possible. Where a delay is unavoidable, the copper-coated surface should be treated for 1 sec. with a mixture of equal quantities of sulphuric and nitric acids, which removes the deleterious film and assures adhesion of the nickel or chromium deposited later; the treatment should immediately precede final plating.

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Hills Precision Die Castings, Cateswell Road, Hall Green, Birmingham—£10,000.

Ridge Limestone, Elgar, Pentre Halkyn, Holywell—£10,000. R. Pettigrew and H. C. Horner.

James Sadler (Engineering), County Bank Chambers, Fishergate, Preston—£5,000. J. and N. B. Sadler.

Over-Man Furnace Equipment—£1,100. D. H. Robinson, 6, Muswell Road, London, N.10, subscriber.

Tamkin Bros. & Company, Waterloo Chambers, Chelmsford—Engineers. £3,000. E. and R. Tamkin.

Sudimex (Engineering) Company, 13, Cumberland Mews, London, W.1—£1,000. D. C. Westbury and S. Anysz.

Universal Equipment Company (Northolt)—£5,000. F. V., B. A., and P. L. Cook, 23, The Common, Ealing, London, W.

Thwaites Agricultural Engineering Company—£40,000. L. B. Thwaites, Cubbington, Warwicks, and C. H. Dew.

H. & A. Engineering (London), 35, Grant Road, Addiscombe, Surrey—£1,000. J. A. H. Hiscock and G. L. Addis.

Lea-Taylor (Sheffield), 26, Eyre Lane, Sheffield, 1—Steel and tool makers, etc. £1,000. R. C., E. S., and H. D. Taylor.

Stewart Gill & Company, 47, Essex Street, London, W.C.2—Engineers, etc. £1,000. C. A. J. Garrard and T. H. Hopkins.

A. Messham & Son, 152, Corporation Street, Preston—Brassfounders and engineers. £8,000. F. C. and F. F. Messham.

Hipkiss Bros., New John Street, Blackheath, Birmingham—Tube manufacturers, engineers, etc. £15,000. H. Hipkiss and F. Willetts.

Albert H. Thomas (Metals), White Rock Works, St. Thomas, Swansea—Metal merchants. £5,000. A. H., O., E. J., and D. G. Thomas.

A. H. M. Engineering Company, 184, Moseley Street, Birmingham, 12—£500. F. A. Matthews, W. and W. T. Howard, and R. M. Apperley.

William Greenall & Son, Wesley Street, Swinton, Manchester—Brass and aluminium founders, etc. £1,000. W. and M. Greenall.

Whiting & Carr—Stampers, piercers, aluminium founders, etc. £1,000. J. B. P. Titchener, 37-38, Haven Green, Ealing, London, W.5.

George Oakley & Company, Meadow Place, Shrewsbury—Agricultural engineers. £15,000. G. Oakley, L. H. P. Bland and D. C. Williams.

Adamson & Crook, Victoria House, Bloomsbury Square, London, W.C.1—Engineers, metal workers, etc. £2,000. A. A. Adamson and J. Crook.

R. H. Booth & Son, Brampton Sidings, West Brampton, Newcastle-under-Lyme—Iron, steel and machinery merchants. £3,000. R. H. Booth and R. H. Booth, junr.

Raw Material Markets

IRON AND STEEL

There has been no material change in the foundry trades, a dearth of orders for light castings contrasting with a fairly well sustained demand for heavy and special castings for engineering, shipbuilding and armament purposes. Supplies of all grades of pig-iron save hematite can be readily provided, but users have only another month to reduce their stocks to the prescribed proportions, and if these are at present exceeded, the Control is not disposed to issue licences for the acquisition of further supplies.

Scrap generally is in demand, and none of the best grades can be described as plentiful. The foundries are not permitted to acquire extra scrap to make up for smaller allocations of pig-iron; otherwise the demand for foundry grades would be even keener than it is at present.

The coke position has improved recently, deliveries having been coming in more regularly, but foundries have so far had little opportunity of replenishing stocks.

Steady employment is provided for the makers of the best grades of bar iron, and a satisfactory output of common iron bars is being promptly cleared. Small sizes are in brisk request, and bookings have to be placed well in advance of delivery dates.

Pressure for the provision of increased tonnages of billets, blooms and slabs is unabated. Re-rollers are confronted with very substantial calls for light sections and special sizes, and they are keen to acquire not only prime billets, but also defectives, shell discard steel, and double-sawn crops. Sheet bars, on the other hand, are available in adequate tonnages, and there is consequently little interest in defectives.

Although the feverish anxiety to secure deliveries of steel plates has subsided, maximum outputs are still required to meet current industrial needs. The big consumers have now become accustomed to specifying their requirements well in advance of delivery dates, and this has led to more orderly methods of production and distribution. Order-books, however, are not perceptibly lighter, and most of the output for the third period is already bespoken. The section mills are now rapidly clearing off the arrears in deliveries, but sheet makers are still heavily committed, and new orders accrue as rapidly as current contracts are completed.

NON-FERROUS METALS

Although a very large amount of non-ferrous metals is going into consumption in this country and most consuming works are still busy, there is not the pressure for supplies that was apparent a year or so ago. The tonnages of all the metals coming to hand, including tin, are ample to meet current requirements, and it seems fairly certain that by this time adequate reserves must be held. Supplies of tin, copper and aluminium have been sent to the Russian war factories. More favourable conditions at sea have made possible the safe arrival of larger quantities of metals, but in some instances, notably lead and zinc, shipping space is being conserved and imports are kept at a minimum compatible with the war effort. This is one of the main reasons why larger civilian concessions have not been made when it has been known that these metals have been in easy supply.

The copper position in this country is being very satisfactorily handled. Shipments have been arriving regularly, and all essential requirements have been covered, with a considerable amount held in reserve stock. America's commitments in supplying Russia have now been transferred to Britain. In America the situation seems to be the complete opposite. All the copper possible is being raised from the domestic mines, the output of which has proved insufficient to meet the heavy demand; imports are being made on an increasing scale, and large quantities of scrap are being called for. Some reports, however, have stated that the gravity of the situation has been exaggerated, and that there will soon be a considerable surplus of copper.

The war demand for aluminium is being supplied without any difficulty, and appreciable reserves have been accumulated. Earlier in the war there was a tremendous drive for supplies, with the collection of all the available scrap—even domestic utensils. The position to-day is quite different, and in some directions scrap supplies exceed requirements.

AT THE annual general meeting of the Institute of Physics held on May 22 last, the following were elected to take office on October 1 next:—President, Sir Frank Smith; vice-presidents, Prof. J. D. Cockcroft, Mr. T. Smith, and Dr. F. C. Toy; hon. treasurer, Major C. E. S. Phillips; hon. secretary, Prof. J. A. Crowther; ordinary members of the board, Dr. H. Lowery, Prof. N. F. Mott, Prof. E. A. Owen, Dr. C. Sykes, Mr. R. S. Whipple, and Mr. C. S. Wright.

CURRENT PRICES OF IRON, STEEL AND NON-FERROUS METALS

(Delivered, unless otherwise stated)

Wednesday, June 7, 1944

PIG-IRON

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

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

Hematite.—Si up to 2.25 per cent., S & P 0.03 to 0.05 per cent: Scotland, N.-E.Coast and West Coast of England, 138s. 6d.; Sheffield, 144s.; Birmingham, 150s.; Wales (Welsh iron), 134s. East Coast No. 3 at Birmingham, 149s.

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

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

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

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

Cold Blast.—South Staffs, 227s. 6d.

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

FERRO-ALLOYS

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

Ferro-silicon (5-ton lots).—25 per cent., £21 5s.; 45/50 per cent., £27 10s.; 75/80 per cent., £43. Briquettes, £30 per ton.

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

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

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

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

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

Ferro-chrome.—4/6 per cent. C, £59; max. 2 per cent. C, 1s. 6d. lb.; max. 1 per cent. C, 1s. 6½d. lb.; max. 0.5 per cent. C, 1s. 6¾d. lb.

Cobalt.—98/99 per cent., 8s. 9d. lb.

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

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

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

SEMI-FINISHED STEEL

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

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

Sheet and Tinplate Bars.—£12 2s. 6d., 6-ton lots.

FINISHED STEEL

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

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

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

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

NON-FERROUS METALS

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

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

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

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

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

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

Brass.—Solid-drawn tubes, 14d. per lb.; brazed tubes, 16d.; rods, drawn, 11½d.; rods, extruded or rolled, 9d; sheets to 10 w.g., 10⅞d.; wire, 10⅝d.; rolled metal, 10¼d; yellow metal rods, 9d.

Copper Tubes, etc.—Solid-drawn tubes, 15¼d. per lb.; brazed tubes, 15½d.; wire, 10d.

Phosphor Bronze.—Strip, 14d. per lb.; sheets to 10 w.g., 15d.; wire, 16½d.; rods, 16½d.; tubes, 21½d.; castings, 20d., delivery 3 cwt. free. 10 per cent. phos. cop. £35 above B.S.; 15 per cent. phos. cop. £43 above B.S.; phosphor tin (5 per cent.) £40 above price of English ingots (C. CLIFFORD & SON, LIMITED.)

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

NON-FERROUS SCRAP

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

Returned Process Scrap.—(Issued by the N.F.M.C. as the basis of settlement for returned process scrap, week ended June 3, where buyer and seller have not mutually agreed a price; net, per ton, ex-sellers' works, suitably packed):—

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

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

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

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

IRON AND STEEL SCRAP

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

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

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

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

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

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

SITUATIONS

FOUNDRY MANAGER (38), M.I.Brit.F. Practical, technical, commercial; repetition expert, light grey and malleable; excellent record; accept full control all depts.; now with London foundry; URGENTLY desires post, MIDLANDS; domestic reasons; free short notice; moderate salary; guarantee results; keen, live wire; tactful, firm disciplinarian.—Box 534, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

HEAD FOREMAN, ironfoundry, seeks re-engagement; highest references.—Box 530, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

PATTERNMAKER (36), practical and technical, good foundry knowledge, holding executive position, desires same; references; A.M.I.B.F.—Box 520, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOUNDRY MANAGER required by established General Engineering Co. in Midlands, to take charge of Foundries producing wide range of castings up to 12 tons, with a capacity of 5,000 tons per annum; good technical qualifications and experience essential.—Write, stating age, experience, and salary required, to Box 498, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOUNDRY MANAGER wanted for Foundry producing 30 tons per week light grey iron castings; Midlands; practical knowledge and experience in patternmaking, coremaking, moulding; handling of labour essential; applicants please give full particulars, qualifications, previous appointments, age, and salary expected.—Box 526, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOUNDRY SUPERINTENDENT required for control of Foundry producing light and medium malleable grey iron and non-ferrous castings; must be good disciplinarian and organiser; good post-war prospects for applicant having good technical qualifications and experience.—Write, stating age and full particulars of experience and salary required, to Box 512, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOUNDRY SUPERINTENDENT required for Non-ferrous Foundry, London area, to supervise production of light and medium size castings; capable of planning and progressing work through all stages; a good disciplinarian; salary, £500-£600 per annum.—Write, stating age, experience, and qualifications, to Box 500, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

PATTERNSHOP Superintendent required for well-known West of Scotland Engineering Works; only applications considered from men of the highest ability.—Box 528, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

HEAD FOREMAN required for Steel foundry in Midlands, producing light steel castings, both jobbing and repetition lines; must be thoroughly capable of controlling labour, energetic, and a sound practical man; sound post-war prospects; good salary paid to right man.—Write, stating age, experience, and salary required, in confidence, Box 514, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

HEAD FOUNDRY FOREMAN required for Iron Foundry in Midlands, making Machine Tool Castings, Diesel and Internal Combustion Engine Castings; must be fully experienced in machine repetition work and jobbing castings; good disciplinarian, and capable of fixing economical piecework prices; this position has post-war prospects for the right man; foundry has output of 60/70 tons per week; weight of castings up to 6 tons.—Apply, stating full particulars of experience, age, salary required (applications not submitting these particulars will not be considered). Box 532, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe, Bucks.

AGENCY

WANTED, by Non-ferrous Foundry, SELLING AGENTS, on a commission basis, to operate in Birmingham, Manchester, and the North, the North-East and Scotland.—Box 486, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

PATENTS

THE Proprietors of the Patent No. 482528, for "Improvements Relating to Abrasive Cutting Off or Severing Machines and Wheels, are desirous of entering into arrangements by way of licence and otherwise, on reasonable terms, for the purpose of exploiting the same and ensuring its full development and practical working in this country.—All communications should be addressed, in the first instance, to HASELTINE, LAKE & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

THE Proprietors of Letters Patent No. 484,270, relating to Production of metals and alloys having a low content of carbon and silicon, desire to grant licences under the patent to interested parties, on reasonable terms, for the purpose of exploiting the same and ensuring its full commercial development and practical working in this country.—Enquiries to be addressed to CRUIKSHANK & FAIRWEATHER, 29, Southampton Buildings, Chancery Lane, London, W.C.2.

IT is desired to secure full commercial development in the United Kingdom of BRITISH PATENT No. 536812, which relates to Methods of increasing Resistance of Metal Articles to the effect of Embrittling Reagents or Corroding Reagents, or both, and to Metal Articles produced thereby, either by way of the grant of licences or otherwise, on terms acceptable to the Patentee.—Interested parties desiring copies of the patent specification should apply to STEVENS, LANGNER, PARRY & ROLLINSON, 5 to 9, Quality Court, London, W.C.2.

MACHINERY

ELECTRIC Furnace wanted, of Heroult type, for manufacture of metals and alloys; about 500 k.v.a. capacity.—Please send full details to Box 518, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

WANTED.—Modern Shot - Blasting Cabinet, and equipment; approximate cabinet size 5 ft. by 4 ft.—Full details and price to Box 235, T. B. BROWNE, LTD., 163, Queen Victoria Street, London, E.C.4.

SKLENAR Patent Melting Furnaces; coke- or oil-fired; capacity 2 tons, 1 ton, ½ ton, 500 lbs.—SKLENAR PATENT MELTING FURNACES, LTD., East Moors Road, Cardiff.

FOR SALE.—One Electric Sand Riddle; one 6-ft. Intensive Sand Mixer; both new.—Box 510, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

MISCELLANEOUS

PATTERNS for all branches of Engineering, for Hand or Machine Moulding.—FURMSTON AND LAWLOR, Letchworth.

A LEITZ MICROSCOPE; suitable for metallurgical work; complete with large amount of equipment; further details on application.—ALEX. HAMMOND, 14, Australia Road, Slough.

FULL details now available for the continuous casting or billets, bars, sections (joists, etc.), tubes (rounds, squares, hexagons), strip and sheet straight from molten metal; metals suitable include carbon and alloy steel, cast iron, aluminium, brass, copper, etc.—Write, in confidence, to Box 522, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

NON-FERROUS FOUNDRY.—Capacity available for castings up to 5 cwts.; good deliveries.—Please send all enquiries to NEWINGTON BRASS & ALUMINIUM FOUNDRY, 46a, Sandringham Street. 'Phone 32509.

FOR SALE.—5 Tons Ingots Manganese Bronze; assay: Cu 61.3%, Sn 1.85%, Zn 32.18%, Pb 0.4%, Fe 0.8%, Al 2.25%, Mn 1.12%, Ni 0.1%.—Offers to Box 496, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

ECONOMISE YOUR COAL DUST.—Wood Dust of Various Grades for Sale; suitable for foundry use.—Send your enquiries to C.S., LTD., Staffa Works, Leyton, E.10.

Mr. Huntsman guards his secret

BENJAMIN HUNTSMAN, after many years of effort, eventually perfected the casting of crucible steel ingots in a quality before unknown in this Country. Originally a Watchmaker of Doncaster, and constantly irritated by the failure of clock and watch springs, this shrewd inventive genius decided to make his own steel and this later became his whole occupation. It is related that in order to protect his secret from his competitors, his Foundry worked only at night, and it was indeed necessary for Mr. Huntsman himself to sleep on the premises, while his workmen were sworn to secrecy.

BROCKHOUSE CASTINGS LIMITED now produce Steel Castings to any specification, including the modern version of the Huntsman steel, and specialise in Heat Resisting Steels, although they will be glad to advise on any form of good steel casting.

Mild Steel Hub by BROCKHOUSE CASTINGS LTD.—a simple example of Converter Steel Casting.

CASTINGS IN STEEL

BROCKHOUSE CASTINGS LTD.
WEDNESFIELD, WOLVERHAMPTON
Telephone - - Fallings Park 31221

THE NAME THAT A BROCKHOUSE COMPANY CARRIES WEIGHT

Holdens

Published by the Proprietors, INDUSTRIAL NEWSPAPERS, LIMITED, 49, Wellington Street, Strand, London, W.C.2 and Printed in Great Britain by HARRISON & SONS, LTD. 44/47 St. Martin's Lane, London, W.

APPLICABILITY

FOUNDRY TRADE JOURNAL
June 8, 1944

In a field that had apparently reached the 'peak' of design, the application of Aluminium Alloys has given the monster Mechanical Digger a new degree of efficiency—bigger yardage at lower cost. For these strong lightweight metals have enabled the capacity of the scoop to be increased by 20-25%, and the saving in weight has increased the speed of operation by 20%. In this development we shall keep pace, adapting our product to the specific needs of its users; our system of production being standardised only for quality. For we produce Aluminium Alloys for every conceivable purpose. Tomorrow it will be for industrial and commercial uses.

INTERNATIONAL ALLOYS LTD
SLOUGH · BUCKS

FOUNDRY TRADE JOURNAL

EST. 1902

VOL. 73. No. 1451.
Registered at the G.P.O as a Newspaper.

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL
JUNE 8, 1944
Offices: 49, Wellington Street, Strand, London, W C2

[Single Copy 6d. By Post 8d. Annual Subscription, Home and Overseas, 21/- (Pre