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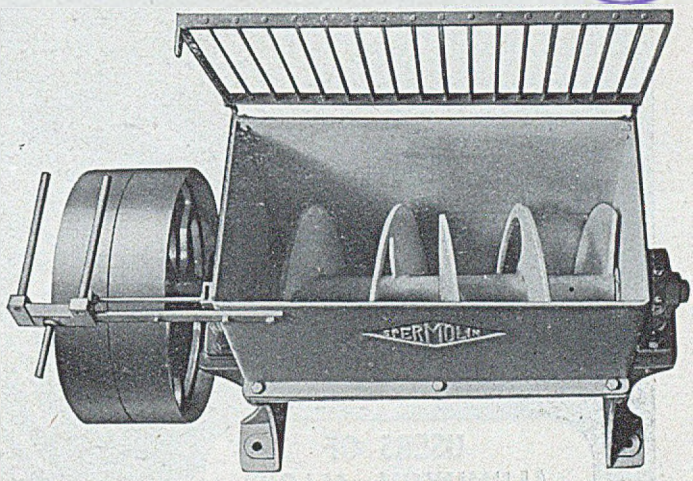
WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL
FEBRUARY 8, 1951
Offices: 49, Wellington Street, Strand, London, W.C.2

Single Copy, 9d. By Post 11d. Annual Subscription, Home 40/-, Abroad 45/- (Prepaid)

The SPERMOLIN

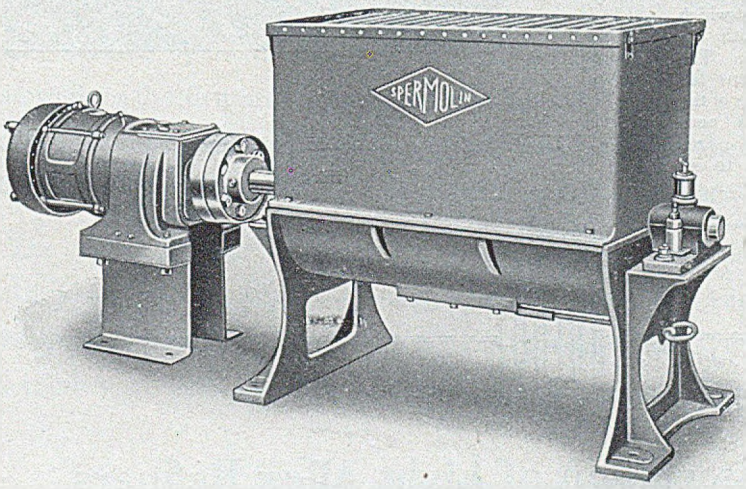
Major

Sand Mixing Machine



BELT DRIVE

Floor space required } 4 ft. 6 in. × 2 ft.
Height ... ... 3 ft.
Capacity ... 6 bucketfuls (1½ cwts.)
Time for one batch ... 4 minutes
Horse power required ... 5 H.P.
Driving pulley } 23½ in. dia. × 4½ in. face
Speed of pulley ... 70 R.P.M.



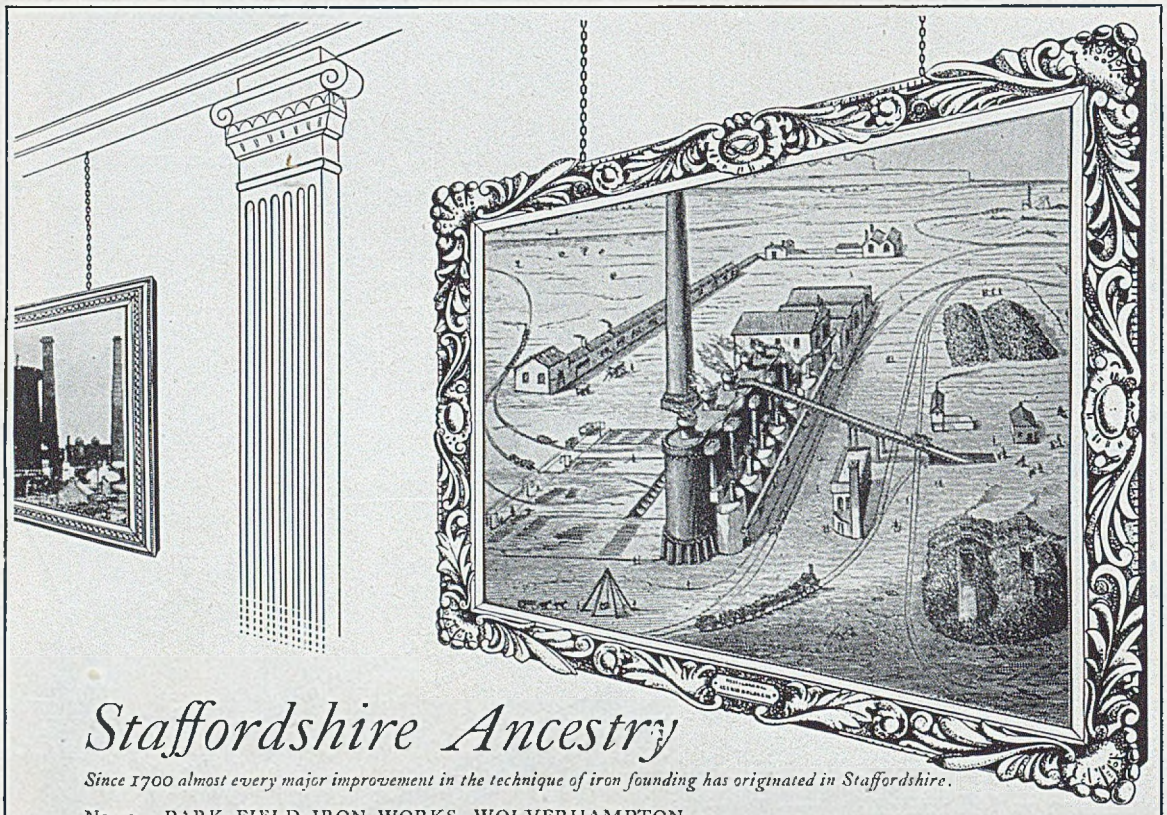
DIRECT DRIVE

Floor space required ... } 7 ft. × 2 ft.
Height ... ... 3 ft.
Capacity ... 6 bucketfuls (1½ cwts.)
Time for one batch ... 4 minutes
Motor ... 5 H.P. geared unit

Spermolin LTD.

HALIFAX, YORKS

Tel.: 4197
'Grams: Spermolin Halifax



Staffordshire Ancestry

Since 1700 almost every major improvement in the technique of iron founding has originated in Staffordshire.

No. 3. PARK FIELD IRON WORKS, WOLVERHAMPTON.

Eighty years ago, the Park Field Iron Works flourished, and if the artist who made the wood engraving is to be believed, flourished in a desolate, treeless plain that lay between Wolverhampton and Tipton.

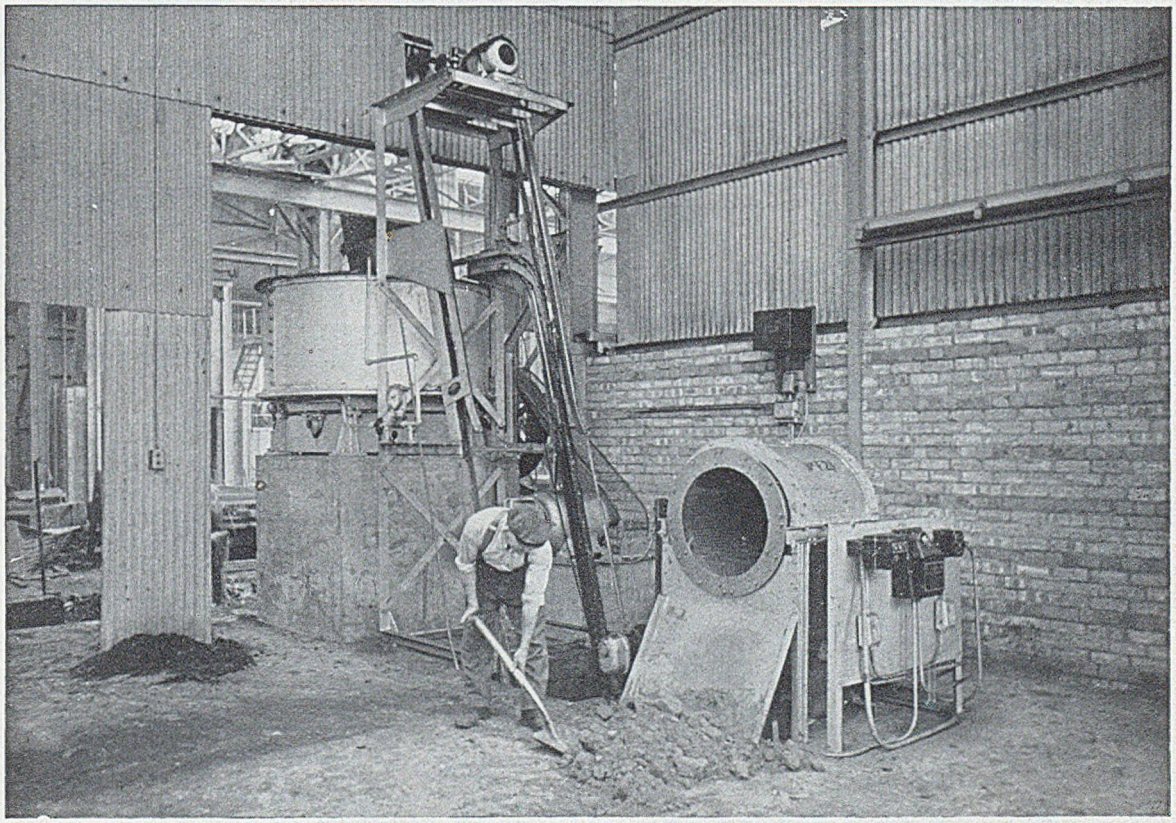
There were five blast furnaces, served by the Work's own locomotives.

The iron made here was a good quality grey forge, and had a great reputation for uniformity and reliability. It was an indispensable mixer for most of the iron then made. Park Field iron gave a peculiar "bell ringing" sound on the "Breaker" — a property ascribed to the quality of the coal used in its manufacture.

● *Pictorial reference is reproduced by courtesy of the publishers of Samuel Griffiths' "Guide to the Iron Trade of Great Britain" to whom grateful acknowledgment is made.*

PNEULEC *facing sand plant unit*

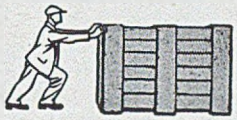
The illustration shows our facing sand plant unit which includes shovel fed rotary screen, collecting belt conveyor, magnetic pulley, loader and 6ft. 0in. diameter mill with disintegrator. The recommended batch capacity of the plant for facing is 6 cwts. and the normal batch cycle 6 minutes. This is a standard layout and there are many successful installations operating in all parts of the world. Further information will be gladly supplied on request.



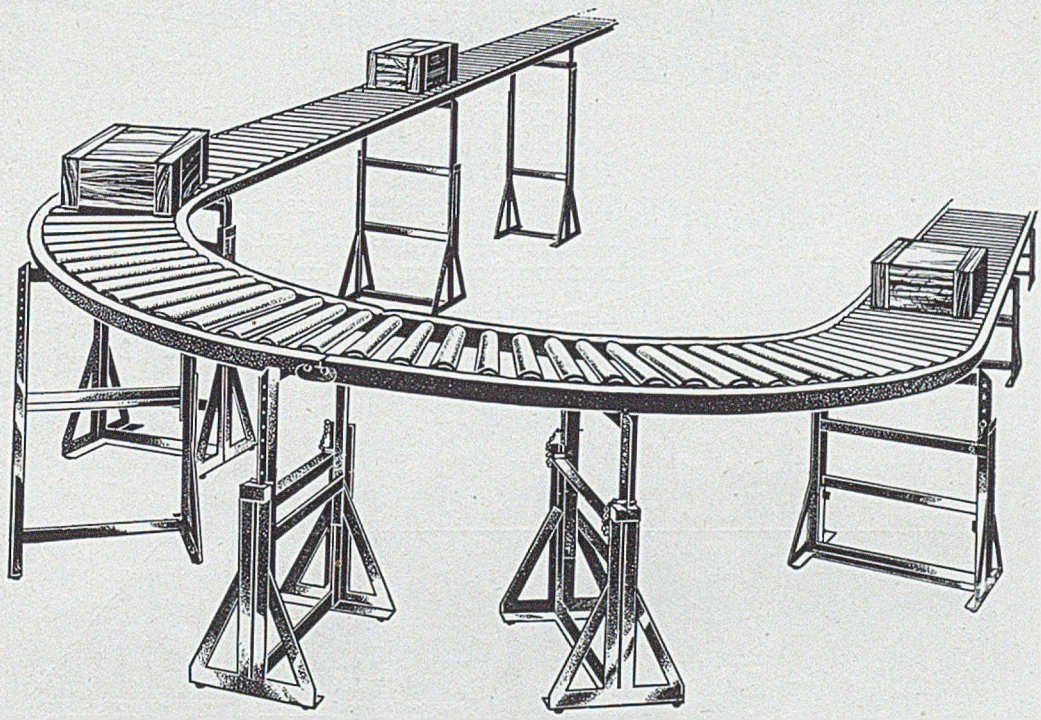
Built in England by

PNEULEC LIMITED, SMETHWICK, Nr. BIRMINGHAM

DON'T PUSH ...



...LET IT ROLL



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UNUSED 90° BENDS

With either parallel or 2¼"—1½" taper rollers suitable for use with the above.

UNUSED PORTABLE ADJUSTABLE TRESTLES

In two sizes, adjustable from 1' 6"—2' 6" and from 2' 6"—4' 0".

Immediate delivery from stock

These conveyors and accessories are offered at very attractive prices. Write for full details.

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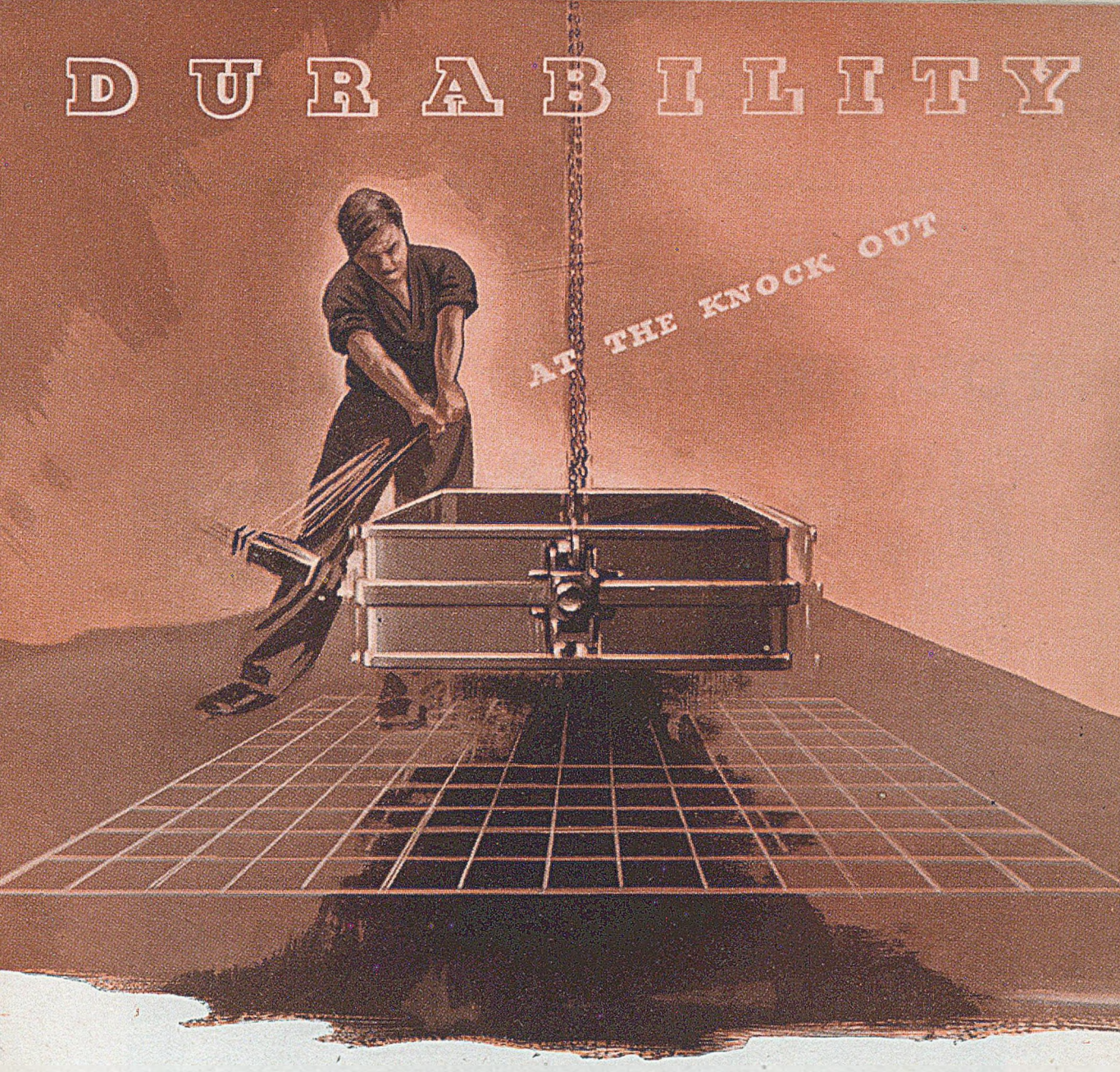
LC/26

DURABILITY



Made from solid-ribbed hot-rolled steel sections, reinforced externally in just the right places for the stresses to be met, Sterling Boxes will if necessary resist the roughest knockout for the maximum period and will last even longer if used in with a Sterling Shake-Out Machine

Sterling

STERLING FOUNDRY SPECIALTIES LTD. BEDFORD ENGLAND

Coreni

BEETLE W.20

KNOCK-OUT PROPERTIES OF BEETLE CORE-BINDING RESIN "QUITE EXCEPTIONAL"

The knock-out properties of Beetle W.20 — the new core-binding resin — have been described by foundrymen as 'quite exceptional'. Opposite are details from the Beetle W.20 data sheet :

W.20 has good dry strength. Green bond agents are added to produce the required green strength.

Low viscosity — handling easy.

Quicker stoving is possible — stoving temperatures may range from 120°C to 220°C.

Permeability of cores not reduced.

Total gas evolution less than usual.

Fumes less troublesome than those of linseed oil—odour reduced to minimum.

All materials used to manufacture W.20 are British—no supply difficulties —delivery is quick.

Conclusions :

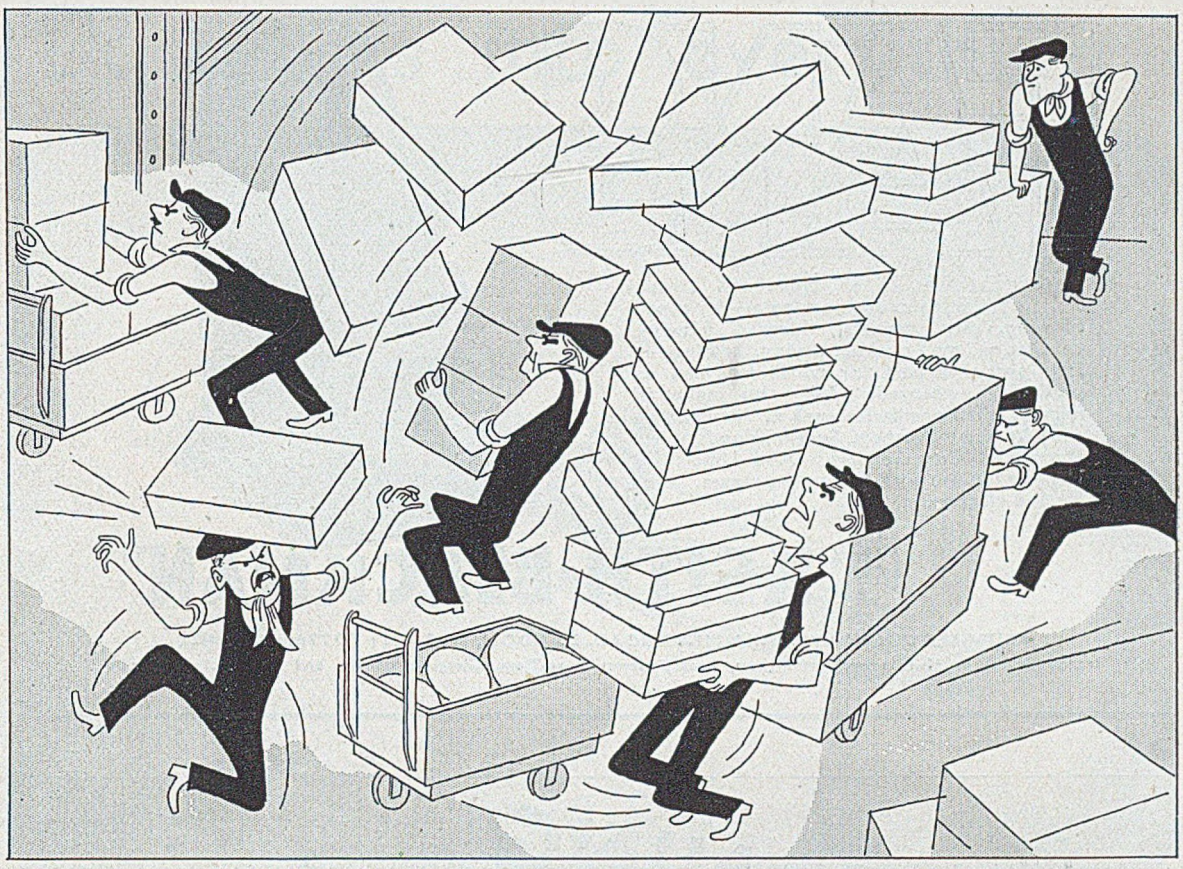
Beetle W.20 Core-binding resin can step up production and simplify the casting of intricately-cored parts. Not the least of its advantages is its all-British manufacture, ensuring promptness and continuity of supply at stable prices.

Write for Technical Leaflet CB1 to :

BEETLE BOND LTD., 1 Argyll Street, London, W.1

B·I·P GROUP

'BEETLE' is a trade mark registered in Great Britain and most countries of the world



WHAT'S RIGHT WITH THIS PICTURE?

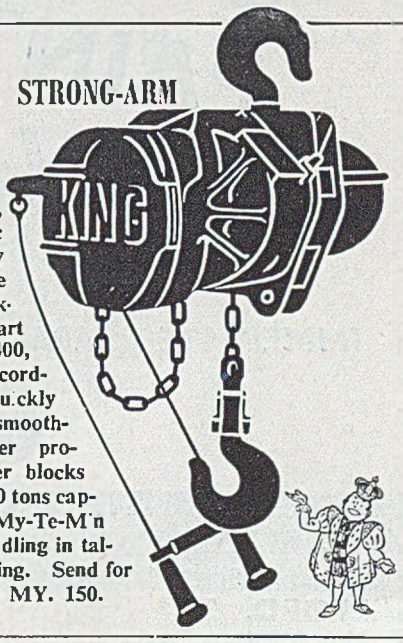
SLAPSTICK is fun—in its place. And its place is not in Britain's factories. Yet this picture merely exaggerates what goes on in solemn reality in many of them. You've seen it—work-space cluttered, machines held up, costs increased by out-of-date handling. One man using a My-Te-Min Electric Pulley Block can lift and shift more tonnage than a three-man strong-arm squad. The My-Te-Min is speeding output; lowering costs in factories of every size in almost every industry.

Geo. W. KING Ltd.

(7) WORKS, HITCHIN, HERTS.

MAKERS OF ELECTRIC PULLEY BLOCKS, CRANES AND CONVEYORS. WRITE FOR ILLUSTRATED BOOKLETS.

AN ELECTRIC STRONG-ARM SQUAD



The My-Te-Min, latest Electric Chain Pulley Block is the biggest little worker ever. Prices start at £60, lifts 400, 600, 1,200 lbs. according to model, quickly pays for itself in smoother, safer, cheaper production. Other blocks available up to 10 tons capacity. For a My-Te-Min (or full-scale handling in tallation) consult King. Send for illustrated leaflet MY. 150.

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

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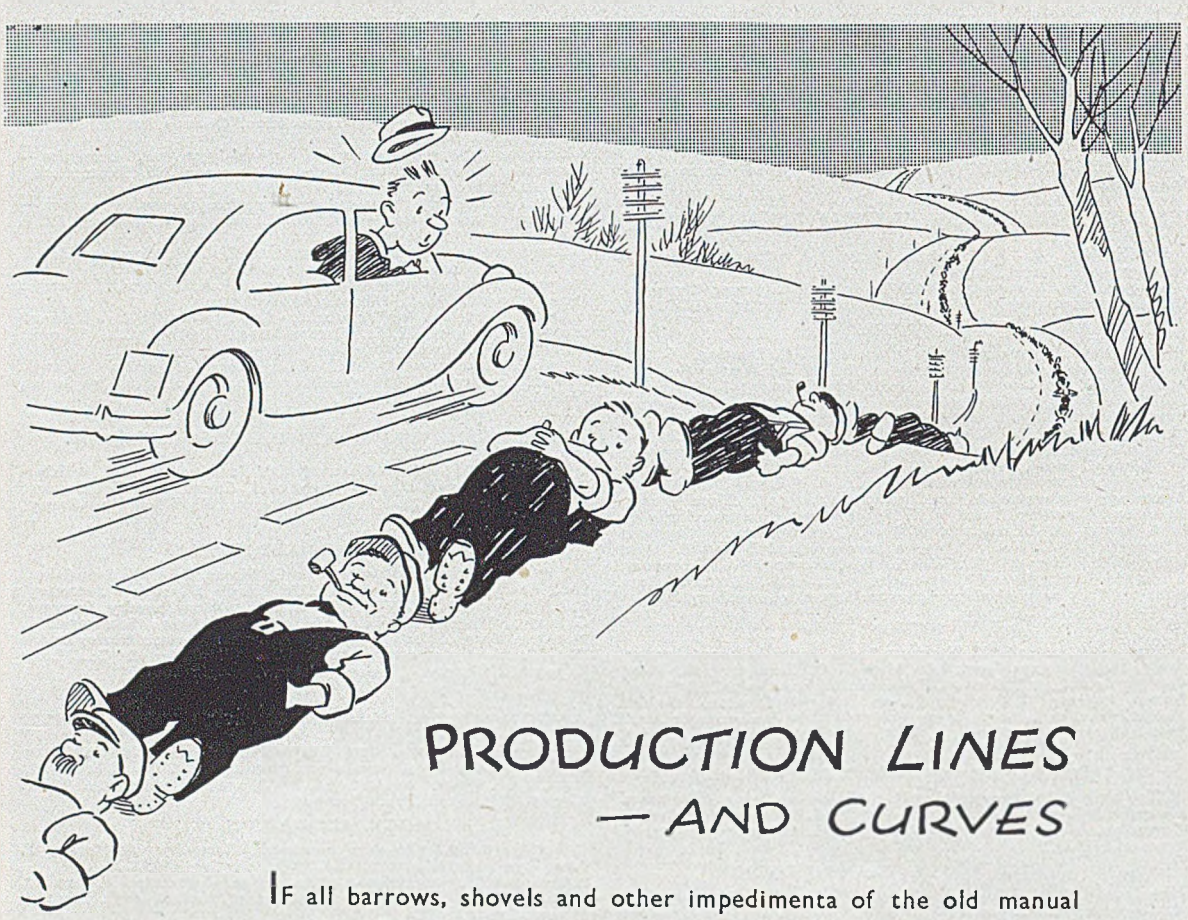

PRODUCTION LINES — AND CURVES

IF all barrows, shovels and other impedimenta of the old manual handling foundry methods were laid end to end they would reach from Land's End to a little beyond Hogsnorton.

And of the foundry workers themselves :—If these now cheerful craftsmen were all laid head to toe-plate on the Great North Road—they'd wish they were back at work.

Sole Licencees and Manufacturers for British Empire (excluding Canada) of the Simpson Sand Mixer.

For modern foundry mechanisation has banished all toil and heart-break, ensuring day-long freshness instead of fatigue—leaving these vitally important producers to pursue their tasks as craftsmen and not cranes.

August's invite enquiries from all interested in true foundry efficiency.

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CONTENTS

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49, Wellington Street, London, W.C.2. 'Phone: Temple Bar 3951 (Private Branch Exchange) Grams: "Zacatecas, Rand, London"

Defining a Foundryman

We recently heard a foundry manager muttering that far too high a percentage of the membership of the Institute of British Foundrymen were not foundrymen. As the word "foundryman" is not included in either English or American standard dictionaries, it allows the individual to create his own conception of its exact meaning. Its origin is unquestionably American. A definition of a foundryman might be set out as a person who from his experience and training makes a worthwhile contribution to the technique of the production of saleable castings. We think it is in order to include the word "saleable," for without it, no foundryman can justify his existence.

It will be seen, on examination that our definition is so wide as to embrace a large number of technicians, and to exemplify just what we mean, we will take the case of the creation of an entirely new mechanised foundry. First, there is the drawing board stage, when much accumulated knowledge is imparted to architects, draughtsmen, mechanical engineers and so on, in order that they may convert this information into a manufacturing establishment. This done, men are engaged and trained to operate the machines, to make the cores, to provide the patterns, and so forth. These men will have to possess varying degrees of skill, ranging from the highest to very little. When manufacturing starts, controls will have to be established to ensure that the liquid metal provided is of adequate composition and delivered at a suitable temperature; to provide sands carrying exact properties, and to make certain that the finished castings are in every way satisfactory. Cleaning the castings and, maybe, heat-treatment, under modern conditions demands a knowledge of quite new techniques. Then the product after meticulous costing has to be sold and many buyers expect salesmen to be high-grade technicians, well capable of advising on design and production methods.

In this picture, there are in the background real foundrymen—the ones who instructed the architects and so forth; engineers, physicists, chemists, cost accountants and technical salesmen with the moulder and core maker playing minor rôles. Another picture could have been drawn, where the traditional craftsmen would be the central features. Thus a gallery of such, would disclose an ever-widening range of technicians—some quite new such as radiologists and statisticians—who must, if their job is to help to make better and cheaper castings, be designated foundrymen. The time-honoured craftsmen—the patternmaker, the moulder, the core maker and the melter, of themselves no longer constitute the complete foundry personnel and the part they play may range from a cypher to the "whole cheese." A reflection on a die casting foundry will bring this statement into relief.

D.

Correspondence

Mr. N. P. Newman, Chairman of the Council of Ironfoundry Associations, has sent the following letter to the ironfounding industry :—

SCRAP

SIRS,—You will be aware of the national appeal which is being made to all users of iron and steel, to release whatever scrap metal they can, so that it can be fed, through the merchants, to the blast furnaces, the ironfoundries and the steelworks. The need is urgent.

The ironfounding industry alone requires some 2½ million tons annually from outside sources. Most ironfounders know from experience how acute the shortage has become. At our recent council meeting, we heard from all quarters reports of the difficulties which our members are experiencing in getting supplies to tide them over from day to day.

We shall be helping ourselves if we can reinforce the national appeal. I know that you have received requests in the past to break up and remelt any obsolete machines or tackle which you may have had on your own premises. Another survey of this kind should be undertaken because tackle can become redundant even in a few months. You may have heavy types of plant which you, yourself cannot break up. May I remind you that you can get scrap breakers to visit your foundry to carry out this work if you apply to your Joint District Scrap Survey Committee. (Details of these committees accompanied the national scrap letter. I can send an extra copy to you if you so wish.)

In addition, we could all make a personal approach to our own customers to impress on them the urgency of our needs and to enlist their co-operation. Ironfounders supply a tremendous diversity of trades and not all of them may have received the national letter. If they can be persuaded to comb their own factories to release scrap to the merchants, your collaboration will have been most valuable.

May I please count on your assistance?

Yours faithfully,

N. P. NEWMAN.

Conference on Film Training

The Scientific Film Association, of 4, Great Russell Street, London, W.C.1, announce that a Conference on the use of the film in training for industry will be held in the Hotel Majestic at St. Annes-on-Sea during the week-end, March 30 to April 1. A number of films will be screened, each being introduced individually so that its purpose shall be clearly understood. There will be several examples of different methods of film planning for specific needs. Although a number of professionally-made films will be shown, there will also be a selection of amateur examples. The secretary would be glad to hear of others of this category which may be available. The fee to cover registration and expenses of the Conference itself is one guinea.

Gas Council

The Industrial Gas Development Committee, which was formerly a committee of the British Gas Council, will continue its work as a committee of the Gas Council. Mr. H. R. Hems, of the West Midlands Gas Board, and Mr. R. F. Hayman, of the North Thames Gas Board, have been elected chairman and deputy-chairman respectively for the ensuing year. The Commercial Managers' Committee includes among its functions the work of the former domestic development committee of the British Gas Council, and has Mr. S. G. Aberdein, of the North Thames Gas Board, as its chairman.

Winget's Scottish Expansion

Winget, Limited, who opened up a servicing plant in Rosehall, Coatbridge, Scotland, four years ago, are to carry out a £12,000 extension scheme to cope with their expanding export trade. Mr. Andrew Reid, works manager, revealed this at Coatbridge on January 30 and said that at present 80 per cent. of the Rosehall works production went to overseas markets. The works were intended to be merely a servicing depot for engineering equipment in Scotland, but within the last year or two, however, commitments of the firm's chief works at Rochester became so large that it was found necessary to pass on a percentage of their work to Rosehall. Much hydraulically operated equipment from Coatbridge—such as mixers, screening plant and pre-cast concrete machinery—now goes to South American, West and East African, and Indian markets.

The Early Bird . . . . !

The morning of January 30 was very cold, foggy and a sharp penetrating frost bit the nose and ears. Old Bill, the cupola man of the Victor Moyle foundry, Kingston-on-Thames, got out of the train at Hampton Wick and trudged to clock on at 7 a.m. muttering as to how one could feel warm on a morning like this and on "eight pennorth" of meat a week. He crawled under and in the cupola to chip out. Then "swoosh" and a lovely wild duck which had been roosting somewhere in top of cupola came down right in Bill's arms. Wasn't he pleased! A tin of green peas and "Bob's your Uncle" for Sunday's dinner.

Dinner

Sheffield Branch

The annual dinner fo the Sheffield Branch of the Institute of British Foundrymen was held at Royal Victoria Hotel on January 29. Mr. J. G. Bailes presided and amongst those present were the Lord Mayor of Sheffield (Alderman Keeble Hawson); the Master Cutler, Mr. G. Wilton Lee; the President of the Institute, Mr. J. J. Sheehan, B.Sc.; Mr. W. H. Higginbotham; Mr. V. C. Faulkner; Mr. F. A Martin, O.B.E.; Mr. D. W. Hammond, B.Sc.; Mr. R. P. Wallace, B.Sc., and Mr. E. J. Thackeray. The organisation was in the hands of Mr. J. H. Pearce the honorary secretary.

WILL MR. C. THOMAS, the Author of the article printed on page 131 of our issue of February 1 please write to the Editor.

"METAL TREATMENT AND DROP FORGING" the well known metallurgical magazine which for 16 yrs. has been published as a quarterly, has made its appearance as a monthly. All the established features have been retained, whilst obviously, because of the more frequent publication, current events are now included. The subscription is 30s. per annum. It is published from 49 Wellington Street, London, W.C.2.

BRITISH BATH COMPANY, LIMITED, of Greenford, Middlesex, recently celebrated the 22nd anniversary of their formation with a dinner at the Greyhound Hotel, Wembley, to which the executive staff and "21-yr." men (employees having 21 years' or more service with the company) were invited. The total of 60 included 40 veterans; Mr. J. Shaw, chairman of Allied Ironfounders, Limited (British Bath Company being one of this group), presided.

"ESSE" Foundry Mechanisation Scheme

By A. R. Parkes

In probably very few of the mechanised foundries of the last decade has there been such elaborate attention given to the smooth working of the sand-supply system as at the new Smith & Wellstood foundry. This aspect is therefore given emphasis in the following account. Such factors as site utilisation; selection and segregation of manufacturing ranges; the handling of moulds, metal and castings; not forgetting the attenuated labour force, all must fit into the assessment of the merits of a mechanised unit. A picture of the relative balance of these factors achieved at the Bonnybridge foundry has been disclosed.

ONE OF THE MOST RECENT of mechanised foundries to come into production is that of Smith & Wellstood, of Bonnybridge, Scotland, makers of the world-famous "*ESSE*" range of domestic and industrial solid-fuel-fired cookers and stoves. This foundry, which mainly supplements the previous facilities, went into production with a flying start on November 20 last, an immediate production of 63 tons per week being realised. A full production of 120 tons is envisaged when all facilities are completed and piece-rate working is introduced.

The company, which was established in 1854, already possessed foundries on the site adjacent producing 150 tons per week, chiefly of plate-like castings for cooker and range assemblies produced by the stall-and-floor-bank method of moulding from double-sided matchplate patterns. Moulding machines were also in use, but these have been transferred along with their operators to the newly-erected premises. Complete mechanisation of ancillary processes with particular stress on sand-preparation has been embodied in the new foundry.

"Nothing left to chance" might well be the motto under which the new foundry, first proposed in 1945, has been built, as this article will show. One hears of mechanisation schemes where the "teething troubles" run into weeks, months or sometimes years. Some remain as white elephants, but it is indeed time that sufficient was known about planning for such ventures that major snags can be avoided. The points emphasised in this article will make clear some of the lessons evidently well learned by the designers and engineers of the "*ESSE*" foundry.

Site Development

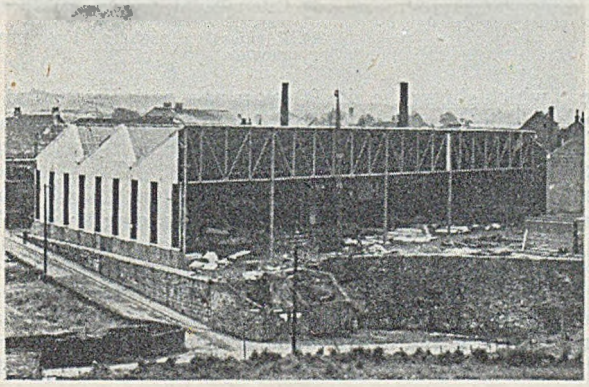
That the site had long been used for industrial

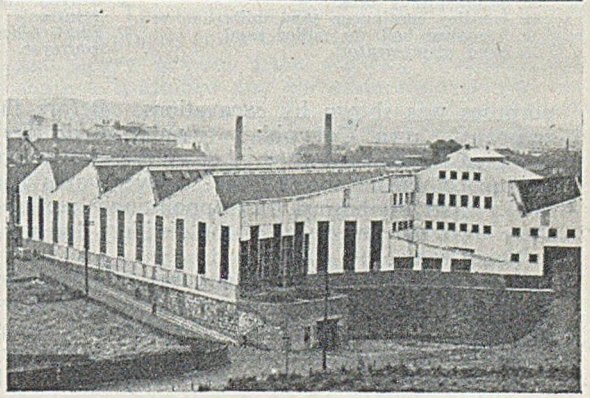
Views of the Site and Construction of the New Smith & Wellstood Foundry.

FIG. 1 (*top right*).—*Photograph of the Site taken Many Years Ago.*

FIG. 2 (*bottom left*).—*Work in Progress on the New Buildings; Note the Lattice Roof Support Construction.*

FIG. 3.—*Building Work almost Completed; the Spark Arresters of the Cupolas may be distinguished.*





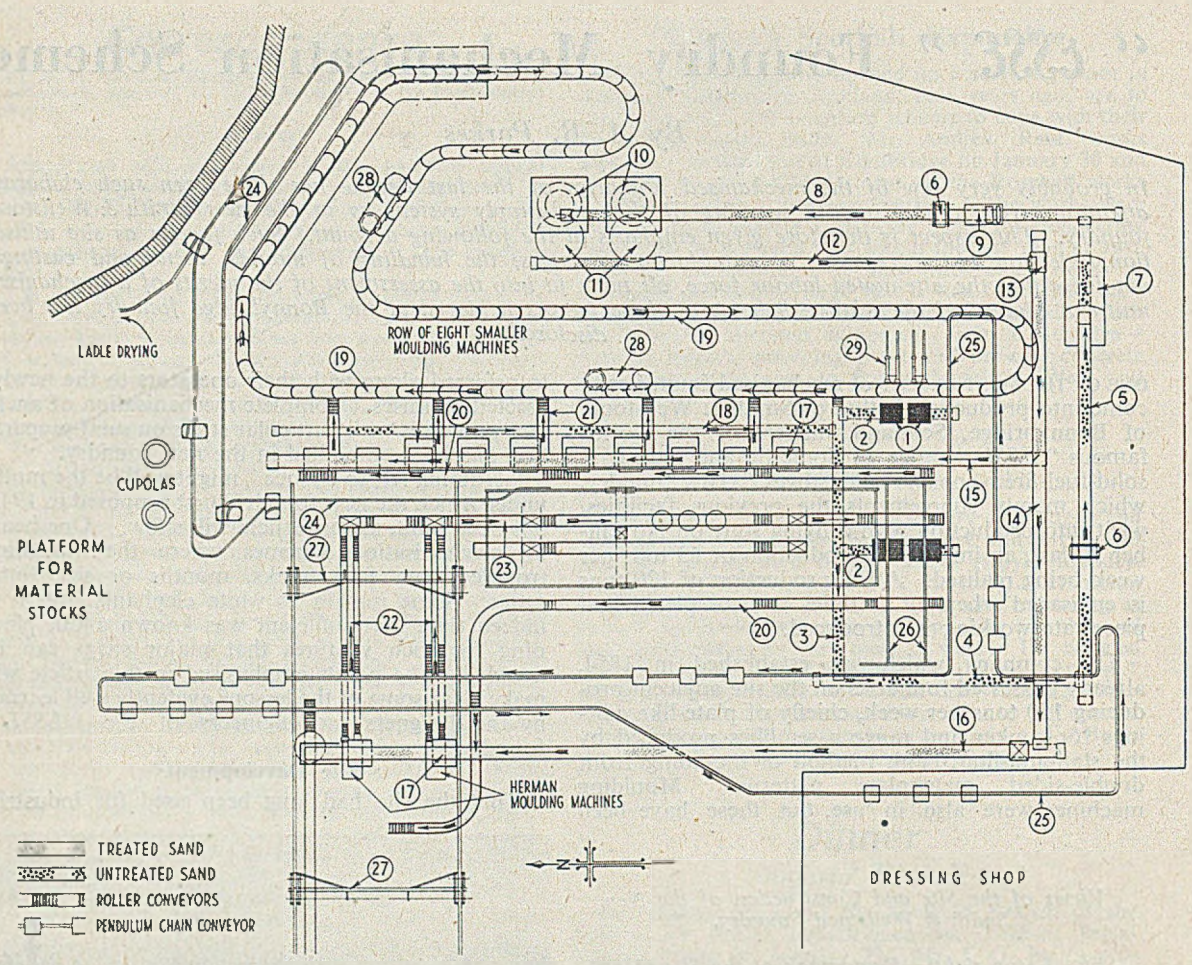


FIG. 4.—*Plan of the New Smith & Wellstood Foundry.*

1. Knock-out grids.
2. Collection sand belts (underground).
3. Main Collection belt (underground).
4. Inclined sand belt conveyor.
5. Flat sand belt conveyor.
6. Magnetic separators.
7. Hexagonal rotary screen.
8. Elevating troughed sand belt.
9. Drum-type sand aerator.
10. Sand storage bins.
11. Smedley continuous sand mills.
12. Troughed belt for milled sand.
13. Sand disintegrator.
14. Main distribution flat sand belt.
15. Belt to sand hoppers above small machines.
16. Belt to sand hoppers above large machines.
17. Sand hoppers supplying moulding machines.
18. Spillage belt conveyor (underground).
19. Power driven, pallet-type mould conveyor.
20. Gravity roller conveyor for box return.
21. Short roller conveyors to pallet conveyor.
22. Roller conveyors for large mould assembly.
23. Roller conveyors for pouring heavy moulds.
24. Overhead monorail for metal distribution.
25. Overhead pendulum chain conveyor.
26. Knock-out gantries for heavy moulds.
27. Overhead travelling cranes for heavy mould assembly.
28. Caterpillar drives for pallet conveyor.
29. Pneumatic pushers for small moulds.

purposes was shown by excavations. Before the company's own Columbian foundry, a distillery occupied the site and at 18 ft. down the presence of a blue coloration showed that a dye works had earlier been established. Disappointingly perhaps, there were but few traces of the distillery and none in liquid form!

Exterior views of the site and new buildings are shown in Figs. 1, 2 and 3. Fig. 4 is a line plan showing in detail the disposition of the plant and equipment, the numbered items being referred to between brackets in what follows. By comparing Fig. 1, which shows the site 90 years ago, with Figs. 2 and 3, which show the new foundry, it will be realised that there has been a build-up, amounting to an average of 20 ft. on the site between times. This increased height has been utilised to build the raw-materials yard part way up to the cupola-charging level. The foundry itself is so high that special drainage has been eliminated, even in the sand-return basements, despite a raised canal along the north-eastern boundary. Only one underground culvert was necessary and that not for canal seepage, but for a natural spring which was led across the site 18 ft. below the

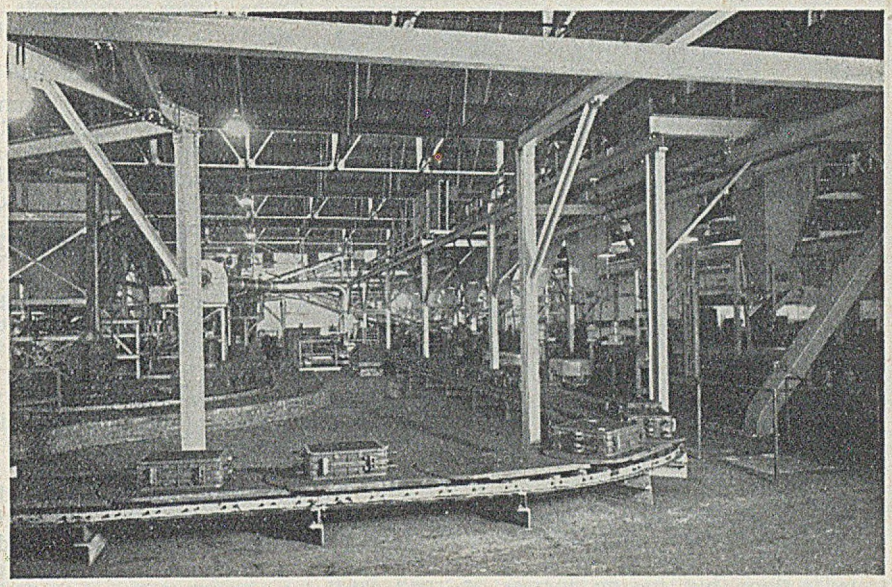


FIG. 5.—*General View of the Foundry. The Pallet Mould Conveyor is in the Foreground, the Row of Small Machines on the* R.H.S. *and the Sand-mixing Plant on the* L.H.S.

floor to deliver along with waste water into the stream at the eastern side. Foundry rubbish is collected in stillages and dumped by lift truck through a chute at floor level collecting in hoppers below. Its disposal is by lorries entering at street level under the hoppers; these can be loaded by release gear on the hoppers operated from the lorry cabs. The dressing shop, also, is raised above the foundry, its exit being level with the assembly and machine shops adjacent.

The roofs are of saw-tooth, north-light-glazed type with 10 per cent. opening glass. Lattice girder construction has been used for the roof trusses, which thus need a minimum of uprights, so leaving the floor relatively uncongested. The whole area of 48,000 sq. ft. has been covered, height to gutters being 25 ft. and to ridges 41 ft. 6 in., steel-framed brick, concrete and asbestos-sheet structures being adopted, comprising four 40-ft. spans and one 31-ft. At present there is space not yet utilised in the "heavy" section. The interior is painted in cream Snowcem and aluminium with services and machinery picked out in appropriate colours. The floor is all concreted except for chequer-plate covers to the sand-return basement passages and the open lattice grids over spillage belts.

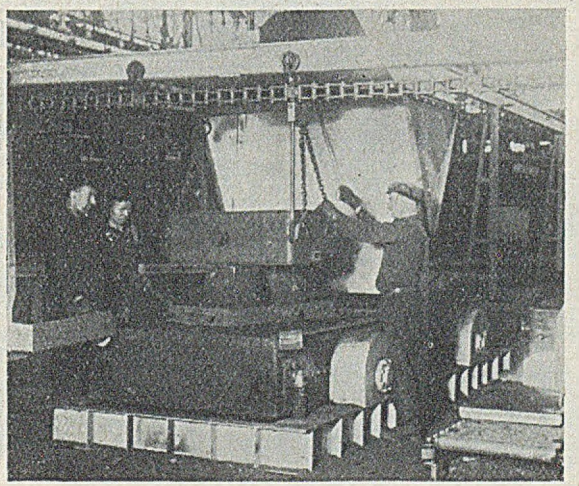


FIG. 6.—*One of the Knock-outs for Larger Castings, showing Exhaust Hood (behind) and Pendulum Chain Conveyor for Removing Castings.*

Interior Layout

The layout, design and manufacture of this completely-mechanised plant was carried out by Paterson Hughes Engineering Company Limited in close collaboration with Smith and Wellstood, such specialist-built plant as knock-outs, magnetic separators, ladles, etc., being incorporated in the scheme.

Broadly speaking, the interior layout shown in Figs. 4, 5, 11 and 12 consists of a row of eight machines (ten provided for), making uncored moulds for stove-plate castings of fairly flat and light design. These are cast on a power-driven pallet conveyor loop (Fig. 5) (19). Separately, there are two larger machines for heavier and more complicated castings. This section is served with overhead cranes (27) and gravity roller tracks (23) for pouring. Light and heavy sections have separate knockouts, but share a combined and elaborate sand supply and reconditioning system: the latter subsequently will be dealt with in some detail. Castings are collected by a chain conveyor with telpher trays, which pass first to the cupola platform where runners and risers are removed and then to the dressing shop. A scale model of the whole foundry was prepared before building commenced so that the internal arrangement could be better assessed.

Metal Supply

Two cupolas made by Constructional Engineering Company, Limited, of a rated capacity each

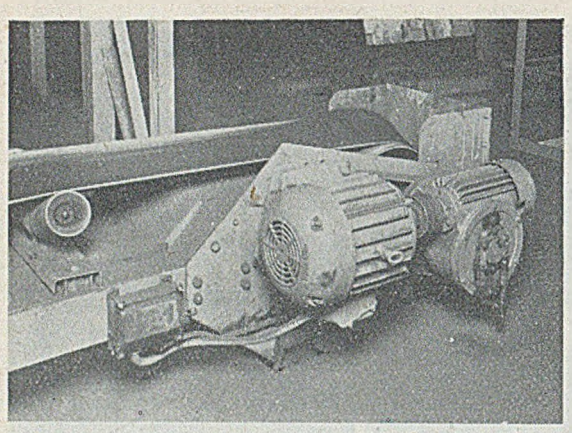


FIG. 7.—*Standard Driving Unit for Sand Belt Conveyors.*

5 tons per hr., are located on the north side and served with raw materials from a steel and concrete platform elevated some 11 ft. above the foundry floor, but having ingress at road level. Adequate under-cover space is available for pig-iron and coke storage, the latter being contained in gate-discharge bins. Charging is by skip-hoist made by Paterson Hughes Engineering Company, Limited, carrying an 8 cwt. charge to a bifurcated chute and delivering to either furnace at will. Blast is provided from two 20-h.p. motorised fans by Davidson's of Belfast, each with a rated capacity of 3,000 cub. ft. per min. against 24-in. w.g.; blast instrumentation being by Metronic Instrument Company, Limited. It has been found that the other cupolas operated by the company sometimes deposited several tons of damp ash on the roofs of the factory in a week; consequently combined spark arrestors and dust catchers have been fitted to the new ones. To take the impact of the charge, 12 courses of 6-in. deep, cellular iron bricks are built in the cupolas extending down to a ring below the charging opening. These present a 1½-in. thick cast-iron face to the interior, their open face toward the shell being filled with a mixture of *ciment fondu* plus refractory concrete. The toes of the bricks are bolted together with finger-tight bolts to form complete rings. Similar bricks on other furnaces have lasted 24 years. Below these iron bricks Scotch firebricks are used.

Durham coke is employed for melting and the metal composition averages C 3.4, Si 2.8, P 1.1, Mn 0.6, and S 0.06 per cent. from mixtures incorporating mainly Scotch and Holwell pig-irons and home scrap. Burnt sand, brushed from the telpher trays during their passage over the materials platform, is used for making up the furnace bottom. At the melting station, a monorail crane equipped with a 20 cwt. electric hoisting block serves (*a*) as a standby for charging, (*b*) for dropping the cupolas, and (*c*) for removing the *débris* when the cupolas are dropped as well as taking out the slag bogies. Housed under the raw-materials stage are the cupola fans and the foundry air compressors, the latter being two 300 cub. ft. per min. Broom & Wade two-cylinder, single-stage, water-cooled units. Total normal air consumption averages 150 cub. ft. per min.

Pouring and Knock-out

Metal is collected from the cupolas in 10-cwt. capacity covered-type Roper one-man-operated ladles, and is distributed on monorails (Fig. 4, item 24) to pouring platforms about 1 ft. 6 in. above the floor arranged on either side of the mould conveyor at the north-east section. Alternatively, metal for the heavier castings is taken in similar ladles, again by overhead runway, to a 24-in-wide gravity roller-conveyor bank for pouring these moulds. Both runways incorporate hand-operated moving-stub switches.

Knocking-out of the smaller castings is by mechanical push-off to two 4-ft. by 3-ft. Sterling vibratory shake-out machines (1), two air-operated pushers (29) furnished by Consolidated Pneumatic Tool Company, Limited, being provided for each machine. On the heavy side, two 6-ft. by 4-ft. shake-out machines (Fig. 6) of the same make are served by overhead runways and air hoists (26). From both knock-outs, castings are loaded on the pendulum trays (6 ft. apart) of the chain conveyor, which has a total length of 570 ft. The rate of travel of this conveyor is variable between four and 12 ft. per min. and in a closed circuit it visits first the cupola plant and then the dressing shop, allowing time for the castings to be cool enough to handle when the latter stage is reached.

Sand Plant

System sand is used throughout, the whole cycle of collection, treatment, and distribution being completely automatic. Everywhere, ideas of foolproof operation, standardisation of detail and careful provision for maintenance have been adopted. The whole system caters for 60 tons per hr. movement throughout, belt speeds being standardised at 120 ft. per min.

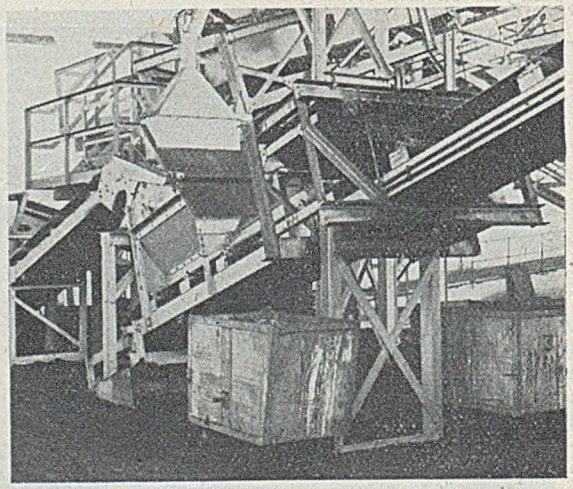


FIG. 8.—*Part of the Sand Elevator to the Storage Bins, showing the Magnetic Separator (note the Stillages below). In the Background is the Aerator and its Dust-extraction Duct.*

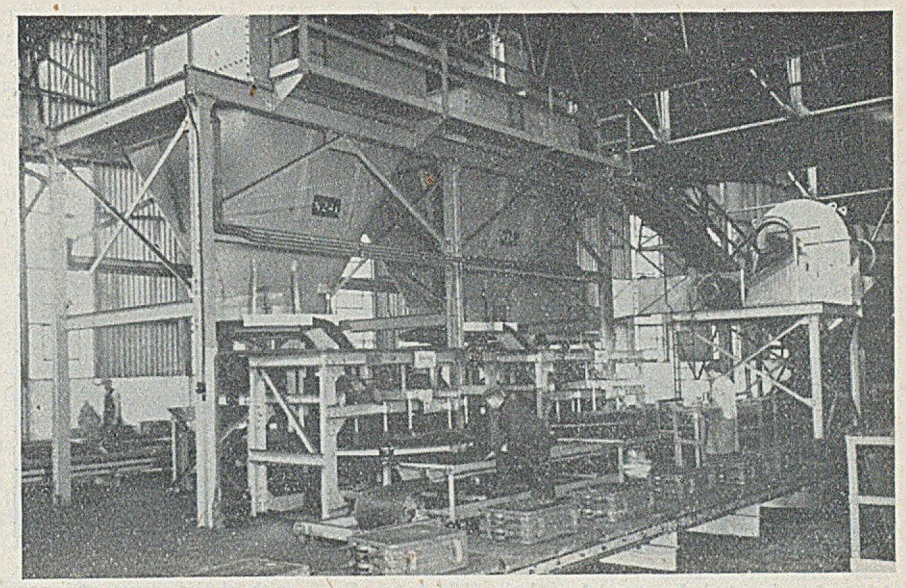


FIG. 9. — *Sand-storage Bins, 30-ton Capacity, and Smedley Mills below, the latter being partly obscured by the Collection Belt for the Treated Sand. Also shown (above ground on the* R.H.S.) *is the Fan for the Dust exhausting Plant.*

Referring again to the plan view (Fig. 4), hot sand from the knock-outs (1), surplus sand from the light machines as well as spillage from this section, passes underground by belts (2) to a main collection belt conveyor (3) 24 in. wide and 54 ft. long.

All belts throughout the plant, whether troughed or plain, are of rubber and canvas construction with rubber covers on the top and bottom faces. They are driven by standard drive units (Fig. 7) incorporating an enclosed motor and enclosed worm-reduction gear directly coupled, only 2- and 5-h.p. motors being adopted throughout. Also fitted is a hand-screw type tensioning gear using self-aligning ball-bearing plummer blocks. All idlers are of the ball-bearing type and all delivery ends of belts are fitted with balanced automatic scrapers.

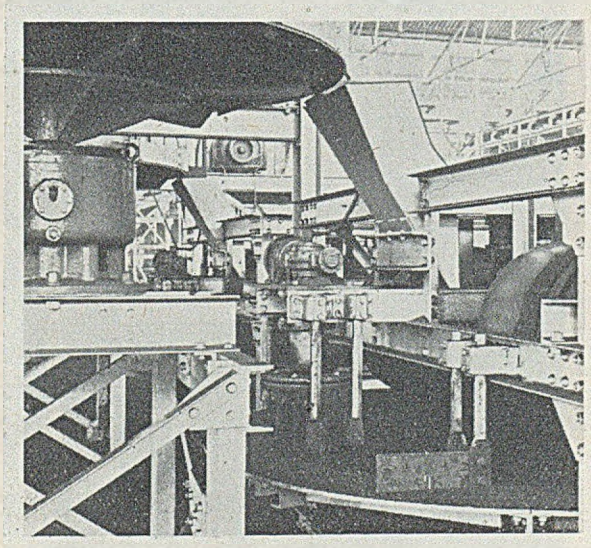


FIG. 10.—*Delivery Point from Sand Storage Hopper to Continuous Smedley Mill. Note (centre) Small Motorised Stirrer.*

Sand is next transferred, at the south-western corner of the plant, to an inclined troughed belt (4), 50 ft. long, taking the sand above ground first to another flat belt conveyor (5), 77 ft. long and thence to a hexagonal rotary screen (7) with $\frac{3}{4}$-in. square mesh fitted with a dust hood and tailings chute. On the way, there is an over-band magnetic separator (6) to take out tramp iron. This is arranged at a convenient height so that a stillage can be placed below for collecting the material extracted (Fig. 8).

Treatment

At the south-eastern corner of the sand plant make-up sand and coal dust are added, from storage bins adjacent, by means of a feed-belt conveyor to the main troughed conveyors (8), which here elevate the sand to two 30-ton capacity cylindrical storage bins 11 ft. dia. by 11 ft. 6 in. deep (10). Erith and local Camelon sands are used, with about 5 per cent. medium-grade coal dust, to the extent of about 3 tons per week (representing something like five per cent. of the total sand in the system). On the way to the main storage hoppers, the sand passes through an aerator (9) and beneath another over-band magnetic separator. The aerator consists of a closed steel drum 18-in. dia., inside a casing. The drum rotates at 284 r.p.m. and carries hardened steel vanes longitudinally along its face on to which the sand falls and is broken up, fluffed and cooled, a fume-extraction exhaust duct being fitted. The sand falls then on to another troughed belt for further elevation. In the storage hoppers, where all the sand collects overnight, there is an opportunity for further cooling and tempering. At the hopper discharge points a central cone and adjustable apron delivering to a rotary table and plough are fitted whereby the feed rate to two continuous, 30 tons per hr. Smedley mills (11) is regulated (Figs. 9 and 10). Water is added by sprays at the mills, the amount being regulated by "Speedy" moisture checks at the discharge end. Sand leaving the mills

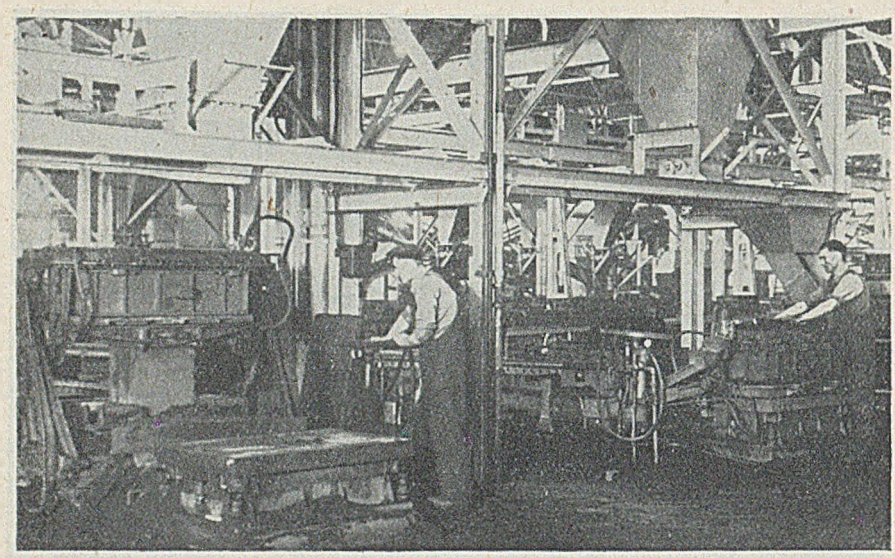


FIG. 11.—*Pneulec Herman Moulding Machines. Note* (R.H.S.) *the Sliding Chute for Directing Sand from the Overhead Hopper into the Box.*

is again elevated by troughed belt (12) to a disintegrator (13), where it is finally broken up before being supplied to the moulding machines. The disintegrator, which is also fitted with a dust-exhaust take-off, consists of two totally-enclosed 4-ft. dia. plates about 15 in. apart, with a series of high-tensile steel crossbars connecting them between which, when rotating at 315 r.p.m., the sand falls.

Distribution of Treated Sand

At this elevation, the discharged sand is conveyed on a flat belt (14) 92 ft. long, again in the direction of the south-western corner. This belt is fitted with hinged ploughs operated from a walkway to divert sand at will to either of two distribution conveyors 30 in. wide running at right angles and continuing above the moulding-machine hoppers. One of these conveyors (15), about 148 ft. long, serves the row of smaller machines and is fitted with ten sets of hinged ploughs worked in conjunction with duplex gate valves controlling the discharge from ten 2-ton capacity hoppers (17). The other distribution belt (16), 142 ft. long, serves the two large-machine hoppers at the north-western corner. Surplus sand at the end of the first belt passes by chute to the spillage belt conveyor underground (18). Each of the machine hoppers is to be fitted with a pneumatic vibrator, operating simultaneously with the opening of the gates.

A little difficulty has so far been experienced in balancing the properties of the system sand to suit large and small jobs, but this is being overcome and apart from this the whole sand plant is working perfectly. No trouble is anticipated with hot sand, but if necessary the plant can be run through lunch-time breaks or after normal closing time for cooling and extra mixing.

Moulding

Heavy Side.—As previously mentioned, the moulding machines of the plant have for the most part been transferred from the other foundry, along with their crews of operators. Although the new servicing has, of course, upset all preconceived ideas of output, it has proved a wise move to begin production with competent men who know the capabilities of their machines. These operators are best able to appreciate the saving in manual effort by having automatic sand supply and full handling facilities and are well fitted to turn the new set-up to good advantage in producing more moulds with less fatigue.

The heavier type of castings production, such as stove bodies, heat and accumulators up to a maximum of, say, 600 lb., is made on a pair of 1,500-lb. Pneulec Herman rollover machines, taking boxes

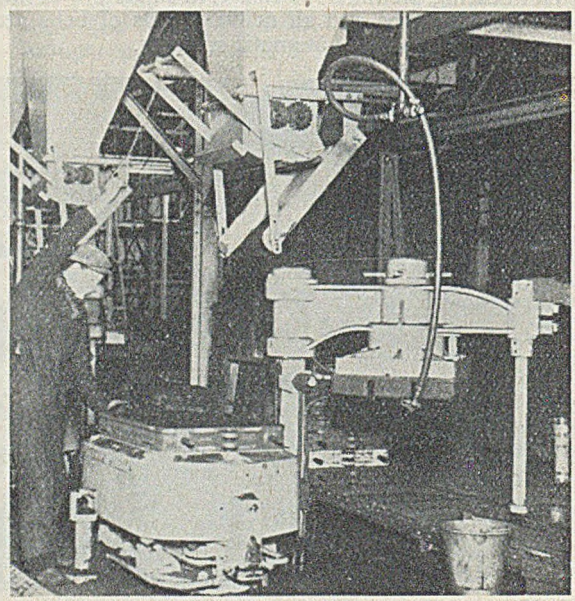


FIG. 12.—*One of the B.I. Squeeze-strip Moulding Machines with Sand Hopper Above.*

up to 4 ft. long. These are shown in Fig. 11. Of particular interest here are the sand chutes directing the supply from the overhead hoppers into the moulding boxes, and which, being carried on overhead rails and runners, can be pushed aside when head-room is required for the roll-over operations.

Only the heavy machines incorporate cores with their moulds, the existing facilities in the other foundry being used for their production. Coring takes place on an assembly gravity-roller track (22), transfer and closing being effected by electrically operated 1-ton capacity overhead travelling cranes (27), one of which is fitted with a "Microspeed" precision lowering control.

Light Side.—The row of eight machines on the lighter jobs (Fig. 12) comprises three pairs of British Insulated magnetic machines, one a strip-squeeze, and one pair of Pneulec jarr-squeeze machines. The box-part range on these machines is from 15 by 22 in. to 22 by 32 in., depths being from 4 to 6 in. All patterns are interchangeable, although the deepest cods, as far as possible, are produced on the Pneulec machines.

Patterns for both heavy and light machines are mainly of the double-sided matchplate type, mostly of cast iron. The technique of patternmaking at S. & W. has previously been described in these columns* and has won commendation from all parts of the world. It is doubtful if production speed, quality or economy of these plates is anywhere surpassed. Good patterns are worthy of careful handling, and adequate storage arrangements have been made for keeping them in fine condition, this it is contended being half the secret of economical moulding.

* "Pattern Equipment for Mechanised Production in a Light Castings Foundry," by J. A. McIntosh. FOUNDRY TRADE JOURNAL, December 18, 1947.

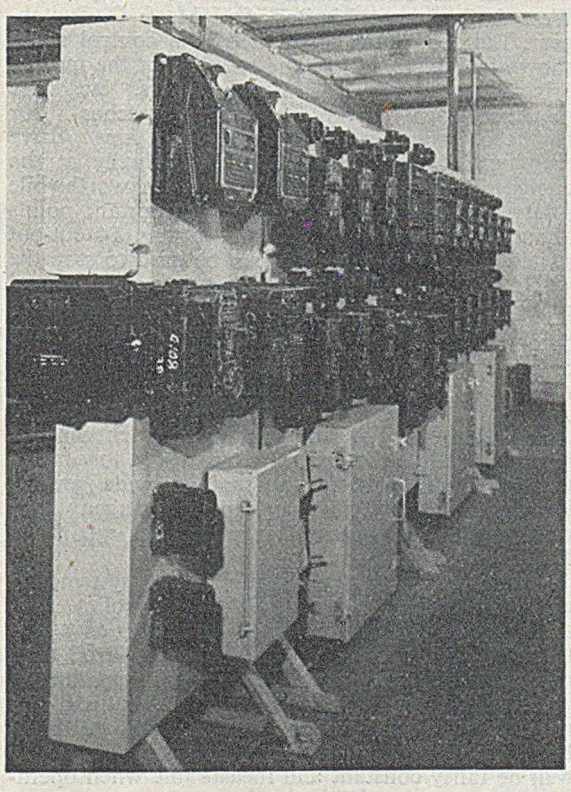


FIG. 13.—*Electrical Switchgear arranged in a Separate Control Room.*

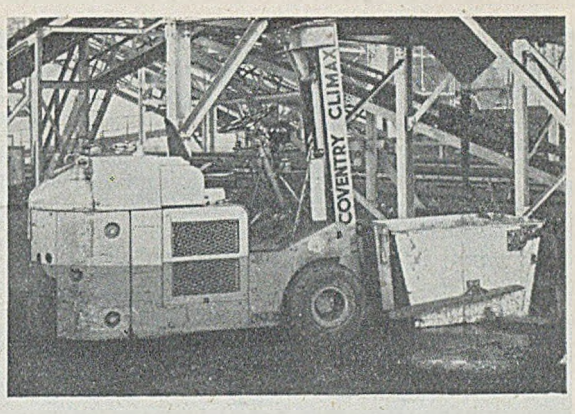


FIG. 14.—*Collection of a Sludge Tank from the Wet Dust Separator by Means of a Fork-lift Truck.*

Mould Conveyor

All moulds produced on the smaller machines are made in cast-aluminium box-parts, with cast-in steel bars. They are transferred by hand to short lengths of roller track (21) between the machines and closed, feeding on to the power-driven pallet conveyor. This, in a 480-ft-long, closed circuit, takes them first to the pouring station and then to the pneumatic push-offs at the knock-outs. The conveyor comprises 102 plates 2 ft. 6 in. wide, arranged on 4-ft. centres, with positive and negative radii at the ends and suited to take a load of 5 cwt. each. They are of cast iron and specially designed for making at the home foundry, each being surfaced on a Lumsden grinder. The speed of the conveyor is variable between 7 and 14 ft. per min.; at 11 ft. per min. a complete circuit thus takes about 42 min. The motion is imparted by two specially-designed and synchronised caterpillar drives (28), each powered by a 7½-h.p. slip-ring motor. After knocking-out, box parts for both the heavy and light sections are returned on straight 24-in. wide gravity roller conveyors (20) and running alongside the machines.

Dust and Fume Extraction

For stove-plate castings, carrying but few cores, dust and fume extraction is perhaps not so serious a matter as would be encountered in, say, an automobile foundry. Nevertheless, the problem has been logically and efficiently tackled. Local extraction has been generously arranged at points of generation, the products being carried to a common collection system inside the building. This installation has been carried out by Sturtevant Engineering Company, Limited.

The exhausting system is designed about a single fan-driven unit, handling 26,500 cub. ft. per min. at

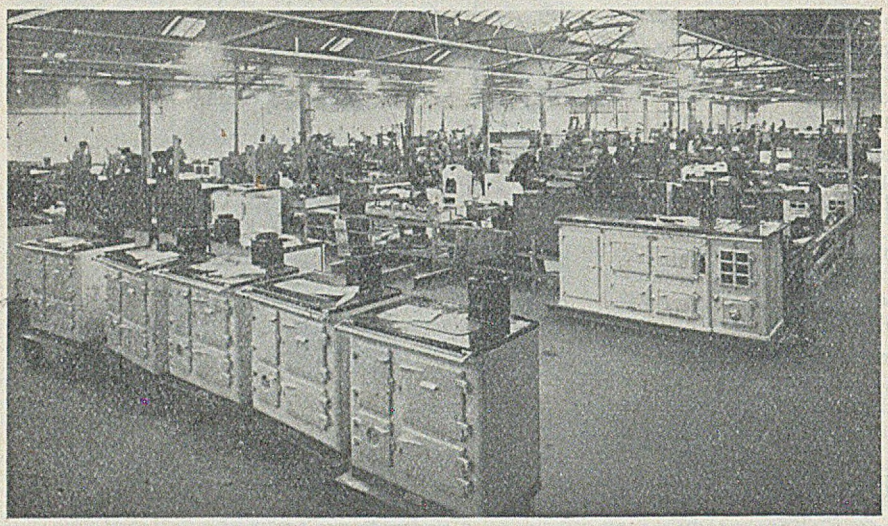


FIG. 15.—*General View of one of the Spacious and Well-lit Assembly Shops.*

a power consumption of 41 h.p. (45-h.p. motor). There are side box-type exhausts at both large and small knock-outs (21-in. and 13-in. dia. ducts respectively) with secondary (6-in. dia.) extraction from the underground pits, sand disintegrator and aerator; in short, wherever the sand is disturbed. The combined duct is carried to a single wet-type arrester (not shown in Fig. 4), situated adjacent to the sand-storage hoppers. This consists of a vertical cylindrical casing, some 11-ft. dia., with a conical lower end and a canvas sludge-hose discharge. The latter delivers into a galvanised sludge-tank stillage for transport by mobile truck (Fig. 14) to the rubbish chute. Features claimed for this wet-type arrester, which incorporates multi-stage filter beds along with a water-spray system inside, are simplicity, low-power consumption (internal resistance only 1¼-in. w.g. and high efficiency). A recent test on over 300-mesh dust at 3 gm. per cub. ft. showed 99.6 extraction. The unit in the S. & W. foundry takes mains water at the rate of 20 galls. per min., no attempt being made at recirculation.

The dressing shop is well equipped, plant includes one additional wet-type dust arrester of the same type as that in the foundry, but 8-ft. dia. The installation of a Wheelabrator is under consideration.

Power

For a total operating personnel of 90 and an output of 120 tons of castings per week, the 388 motor h.p. available is prodigious. This figure includes stand-by units and those for the fettling shop. A large proportion of the total is made up of standard interchangeable 2- and 5-h.p. motors, particularly on the sand-plant conveyors. Among the exceptions are the two caterpillar drives to the power-driven mould conveyor, the 7.5-h.p. motors of which operate through fluid drives and variable synchro-mesh gear boxes and the sand mills, taking 15 h.p. each on their main drives, with 7.5 h.p. on the rotating feed-tables and 0.75 h.p. on the stirrers (shown in Fig. 10). Sand conveying and knocking out accounts for 59 h.p., compressed air 125, ventilation 45 and cupola blowing 40. The total sub-station load is 250 k.w., through a Bryce 500 k.v.a. transformer connected to the "grid," 6,600 v. supply giving the usual 440 v., 50 cycles, three-phase current for motors and 110 v. single-phase for lighting.

Control

Of the electrical switchgear, supplied by Allen West & Company, Limited, and M. & C. Switchgear, Limited, much is isolated in a control room shown in Fig. 13. Here the starters for the motors driving conveyors, elevators, mixers, etc., are sequence-timed from master switches for balanced running. Alternatively, any drive may be cut out or operated individually at the choice of the electrician in charge. A worthwhile safety feature is the provision at important points about the foundry of no fewer than 14 cut-out switches, any one of which can be used to stop the whole plant. In the event of any stoppage, emergency or otherwise, motors can only be restarted in correct rotation and a warning bell has to ring 15 secs. before the first motor can start.

Lighting and Heating

Tungsten-filament lamps have been chosen for lighting on the grounds of first cost and low maintenance. Thirty-six 500-w. units provide general illumination and auxiliary lighting is arranged where necessary. The sand-return basements are lit by 15-w. bulk-head lamps.

Before installing any overall heating system, the company decided upon a wait-and-see policy, considering that the answers to the problems of "how much?" and "where?" could be answered with more exactitude when the plant was running. A working foundry itself produces much heat and in a mechanised installation the quantity and its distribution is conjectural at the design stage, but may well be fairly constant and measurable when operation commences. With this in mind, a number of the firm's own circular solid-fuel-fired stoves have

been installed at strategic points as a temporary measure, smoke being led outside the building.

Maintenance

Provision for simplified yet adequate maintenance has everywhere been arranged. Reference has already been made to the high degree of standardisation achieved with this end in view. Access to overhead plant is by walk-ways and underground plant is covered by removable chequer-plates or grids and substantial passages have been incorporated. Essential plant is all duplicated directly or indirectly. Approximately 3,000 greasing points are provided, nipples which would normally be difficult of access being piped to a convenient position. All belt-conveyor idlers are fitted with independent lubricators.

Labour and Amenities

S. & W. Limited have long held an enviable reputation for good working conditions (Fig. 15, for example, shows one of the company's assembly shops), and the new foundry is no exception. Foundry workers among the 1,100 employees already enjoy superb washing and changing facilities in the main works, these including ultra-violet treatment when desired. In the new building a Bradley hand-washing fountain has been added to the existing facilities. About 95 per cent. of the whole staff make use of the amenities available.

CONTRACTORS AND SUPPLIERS OF PLANT FOR THE "ESSE" MECHANISATION SCHEME.

Pressure Piling and Concrete Work: John Gill, Contractors, Limited.
Constructional Steel Work: The Glasgow Steel Roofing Company, Limited.
Building Contractors: Duncan Stewart (Bonnybridge), Limited.
Glazing: The Pennycook Patent Glazing & Engineering Company, Limited.
Paint Work: Structural Painters, Limited.
Mechanised Plant: Paterson Hughes Engineering Company, Limited.
Cupolas: The Constructional Engineering Company, Limited.
Dust Extractors: Sturtevant Engineering Company, Limited.
Fans: Davidson & Company, Limited.
Electrical Cables: British Insulated Callender's Cables, Limited.
Switchgear: M. & C. Switchgear, Limited; J. G. Statter & Company, Limited.
Moulding Machines: British Insulated Callender's Cables, Limited; Pneulec, Limited.
Ladles: E. A. Roper & Company.

A welfare club provides recreational opportunities; its equipment includes four billiard tables, a dance hall, gymnasium, carpet-bowling tables and a reading room. Outdoor sports are well catered for, there being three tennis courts and a strong football club.

Acknowledgments

In concluding, the writer gratefully acknowledges from the directors of Smith & Wellstood, Limited, permission to publish this account and to use the information freely made available by the staff and main contractors. He especially appreciates the work of all those who have helped to make such a worthwhile contribution to progress in the Scottish light castings industry, where the *"ESSE"* organisation already held an honoured position.

Power and Production

Festival Tribute to British Industry

The story of British manufacturing industry, from raw materials to finished products, will be featured in the "Power and Production" Pavilion of the Southbank Exhibition, London, from May 4 to September 30. The building, placed on the western fringe of the site, will form part of the "upstream" sequence which will describe the land of Britain, its resources and the ways in which they have been developed by the enterprise of the British people. The tubular steel frame of the building is already complete. It stands about 50 ft. high and approximately 300 ft. by 100 ft. on plan. It is being covered externally with glass, corrugated asbestos and brick panels.

Outstanding features of the display will include a selection of modern machinery which will reflect the continuing inventiveness of British engineers. The machines, all working, will be of the latest type and some will be on view for the first time. A display of craftsmanship in which several British craftsmen will demonstrate their skill, and a showroom where typical current products of British craftsmen and machine manufacturers will be displayed, as in the showroom of an individual firm.

Two of the Exhibition's ten trade information bureaux will be located in this building, one in the entrance hall and the other in the showroom. The former will also serve industries represented in the "Minerals of the Island" Pavilion. Both will be open daily and will be linked to the specialised information bureaux in another display section, "Design Review."

Metals

There will be the story of metals—how they have replaced older materials, the ways in which they are manipulated and prepared. First, there is the ingot, starting point for the processing of steel. Then come the four main processes: rolling, forging, extrusion, and casting. This last, perhaps the oldest method of shaping metals, will be illustrated by two chief groups of exhibits, a motor-car cylinder block complete with the moulds and cores, and a display showing how a sand casting is made. Examples of different patterns and castings will also be on view.

Research

Research will be described with reference to four industries which include metals. The latter will be mostly concerned with the development in Britain of magnesium-zirconium alloys which are now used in the manufacture of gas turbines. In addition, visitors may view a selection of metal research instruments, among them machines for creep-testing and impact testing.

In the section on design, two examples, a case-history in drawings showing how the design of one product, a motor-car, is worked out, and the design development of a gas cooker will be traced with special emphasis on the research entailed.

Management

The correct arrangement of buildings on a factory site, a good layout of plant inside the factory, proper lighting and a suitable use of colour on machines and surrounding objects will be shown in the management section.

Under the heading, production machines, leading examples of up-to-date British machinery will form a central group of exhibits in the pavilion. All of them will be actually working and producing. Two further exhibits—a flat truck and a fork lift truck—will ensure a flow of materials and finished products to and from the machines. There will be included in this exhibition a pressure die-casting plant.

Maximum Prices for Non-ferrous Scrap

The Ministry of Supply's Order fixing maximum prices of non-ferrous scrap—"to discourage hoarding and stabilise scrap prices so that they are in reasonable relation to the prices of virgin metal"—came into operation on Saturday last. The Order—Non-ferrous Metals Prices Order (S.I. No. 155)—was made after consultation with the trade. Introducing the Order, the Ministry stated that prices of non-ferrous scrap have in recent weeks been reaching inflated levels and in many cases scrap metal has been on offer at prices in excess of virgin prices. Simultaneously there has been a falling off in supplies due, it is believed, to scrap being held back against a further rise in price. Any prolonged interruption in the flow of non-ferrous scrap for re-use would, the Ministry said, have a most serious effect on production.

The fixed maximum prices will be as follow (ex depot except where otherwise stated):—

SECONDARY METALS

Remelted lead, £126, delivered buyers' address; remelted zinc, £145; hard spelter, £135; secondary zinc alloy to B.S.S. 1141, £168.

SCRAP METALS

COPPER: Bright wire, tinned or untinned, £180; firebox, £180; No. 1 wire, £175; clean heavy, £170; No. 2 wire, £165; braziery, £148.

LEAD: Cable sheathing, £124, delivered buyers' address; other; £117, delivered buyers' address.

ZINC: Alloy die castings free from inserts, £145; cuttings, £125; alloy die castings not free from inserts, £120.

ADMIRALTY GUNMETAL: 9 per cent. tin, 0.5 per cent. lead, £235.

COMMERCIAL GUNMETAL, £195.

CUPRO NICKEL: 80/20, £200; 70/30, £180.

GILDING METAL, £180.

BRASS: Shell cases, £175; S.A.A. cases, £165; cuttings, £165; rod and fuse scrap, £155; swarf, £145; heavy, £140.

The new Order provides a formula for fixing the maximum prices of any material not included in the list. All prices are subject to abatement for inferior quality or lack of cleanliness. *Bona fide* scrap merchants may add to their selling prices a merchanting margin not exceeding 1½ per cent. for lead scrap, and 2 per cent. for other material, except remelted lead. No margin is permitted on remelted lead. The charge for bagging must not exceed 9d. per bag. The extension of control to secondary copper and copper alloy ingots is under consideration.

Under the terms of the Order invoices of scrap transactions must describe the material sold and show how the price is calculated. The seller must preserve copies of all invoices. The Order contains an exemption for scrap situate outside the U.K. This is also an exemption for scrap intended for export, but non-ferrous scrap is subject to export control, and licences are not normally granted.

The Ministry of Supply expects shortly to make a further Order to provide for licensing of the acquisition of non-ferrous scrap and secondary metal and for the rendering of periodical stock returns, but he is anxious to avoid instituting a detailed distribution scheme. The immediate return of all scrap for reuse is the best way to prevent this and in the national interest the Minister appeals to all concerned to co-operate in ensuring that the maximum flow of scrap is achieved.

MR. R. PARKER, assistant lecturer in metallurgy, University College of Swansea, formerly employed by the Appleby Frodingham Steel Company, Scunthorpe, has been granted a post-graduate travelling scholarship in extraction metallurgy, awarded by the Nuffield Foundation.

Personal

MR. J. HASTINGS, of H. W. Hunter & Sons, Limited, has been elected chairman of Edinburgh and Leith Metal Merchants' Association for the ensuing year, and MR. T. YOUNG has been appointed secretary.

MR. J. A. KILBY, manager of the engineering plant and development section of Colvilles, Limited, Glasgow, has been appointed chief mechanical engineer to the companies within the group. He succeeds Mr. T. W. Hand, who is retiring.

MR. W. E. A. REDFEARN, a special director of English Steel Corporation, Limited, has been elected chairman of the Alloy Steels Association in succession to the late Major Guy S. Newton.

MR. LUIS BARREIRO, the Spanish metallurgist and editor of "Boletin Minero e Industrial," who is consul of the Dominican Republic at Bilbao, was recently honoured by the president of the Republic, who conferred upon him the Knighthood of the Order of Merit of Juan Pablo Duarte.

MR. S. C. WADDINGTON, works manager at the Parkfield Works, Stockton-on-Tees, of Ashmore, Benson, Pease & Company, Limited, manufacturers of furnace plant, etc., for the last nine years, who is retiring soon, has been presented with an inscribed silver tankard on behalf of the workmen. He joined the company in 1907.

DR. J. B. MAVOR, chairman of Mavor & Coulson, Limited, the Glasgow mining machinery manufacturers, is the first president of the Glasgow branch of the Institute of Industrial Supervisors, which held its first meeting last week.

SIR HENRY TIZARD, FRS, is to be elected an honorary fellow of the American Institute of Aeronautical Sciences. Last June it was announced that Sir Henry, who was 65 in August, had asked for the burden of his work to be lightened, and it was arranged that he should carry out his duties as scientific adviser to the Ministry of Defence on a part-time basis only. He is chairman of the Defence Research Policy Committee.

MR. C. H. DOLPHIN, who recently retired from the position of publicity manager of English Steel Corporation, Limited, and Darlington Forge, Limited, and Mr. R. Russell, advertising manager of Moore & Wright (Sheffield), Limited, tool manufacturers, have been awarded fellowships of the Incorporated Advertising Managers' Association for their contribution to advertising. Mr. Russell, who is secretary of the Sheffield branch of I.C.M.A. has organised exhibition stands in various parts of this country and at the Canadian International Trade Fair.

Prices of Oils

The Minister of Food announces that increases will be made in the prices of unrefined oils and fats and technical animal fats allocated to primary wholesalers and large trade users during the four week period ending March 3, 1951, from which the following have been selected (per ton naked ex-works except where stated):—

Palm-kernel oil, crude and crude oleine from £105 10s. to £125.

Cottonseed oil, crude from £109 to £125.

Sunflower oil, crude from £110 10s. to £128.

Linseed oil, crude from £136 to £144.

Palm oil, £100 10s. to £109 10s. per ton c.i.f. in casks, to be returned.

PLANS HAVE BEEN APPROVED for extensions to the foundry of Carmichael Bros., Limited, South Shields.

Silicon Distribution in Freezing Hypo-eutectic Cast Iron*

By A. Hultgren and O. Carlsson†

DURING THE FREEZING of an iron/silicon alloy of suitable composition, the liquid is richer in silicon than is the solid delta iron being precipitated. According to the iron/silicon/carbon equilibrium diagram of Jass,[1] applied to the freezing of cast irons by Hanemann and Schrader,[2] this is true for iron/silicon/carbon alloys up to a certain carbon content, beyond which the tendency for distribution of silicon is reversed. According to this diagram the latter condition is also obtained for ordinary cast iron, in which austenite is the precipitated iron phase. Consequently, while austenite is precipitated and, later, while the graphite eutectic forms, the mother liquor is impoverished in silicon.

Experimental Investigation

In view of the importance of the silicon distribution for the interpretation of matrix structures in grey cast iron, a simple experiment was made to confirm the silicon distribution given by Jass's diagram. A hypo-eutectic cast iron was allowed to freeze slowly in a graphite crucible. When a suitable mushy stage had been reached, a pre-heated graphite tube, with a small bore and fitting loosely inside the crucible, was pressed down into the melt, causing part of the remaining mother liquor to rise around and into the tube. After freezing, the plug formed in the tube, as well as the main undisturbed mass of metal at the bottom, were analysed for silicon and phosphorus. Fig. 1 shows the crucible with the graphite tube and the melt in position before and after lowering the tube.

TABLE I.—*Chemical Composition.*

Experiment.	Sample.	Dip.	C, per cent.	Si, per cent.	Mn, per cent.	P, per cent.	S, per cent.
1	Main mass		2.60	1.90	0.34	0.28	0.065
	Plug ..	1		1.81		0.33	
	Plug ..	2		1.75		0.37	
2	Main mass		2.71	1.93	0.41	0.31	0.080
	Plug ..	1		1.88		0.35	
	Plug ..	2		1.71		0.46	

Two similar experiments were made with cast irons of different composition, as given in Table I. In both experiments the melt was heated to 1,400 deg. C. in a high-frequency furnace and maintained at this temperature for 5 min. The melt was allowed to cool with the furnace, very slowly, particularly through the freezing range. The graphite tube, heated to dark redness, was dipped twice into the melt, and on removing the tube after the first dip, the portion of the melt round the outside of the tube settled again, but the interior portion had frozen in the hole and remained in the tube. After the second dip, however, the outer portion of the melt remained in its displaced position on removing the tube. The time of each dip was 20 to 30 sec., and the weight of the plug was about 10 gm.

Analytical Results

The results of the chemical analysis of the plug and of the main mass sampled as indicated in Fig. 1 are given in Table I.

To ascertain whether there was any segregation in the surface layer of the solidified melt, a similar

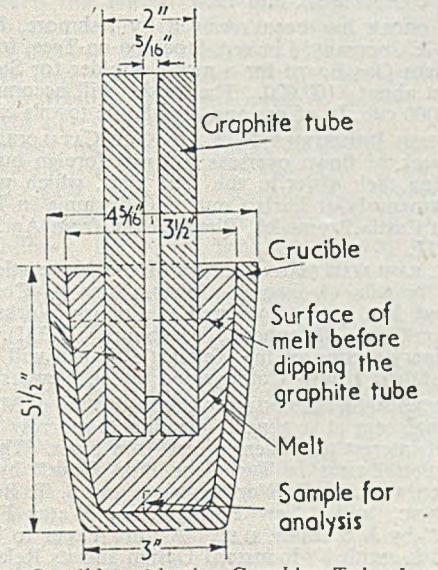


Fig. 1.—Crucible with the Graphite Tube Immersed.

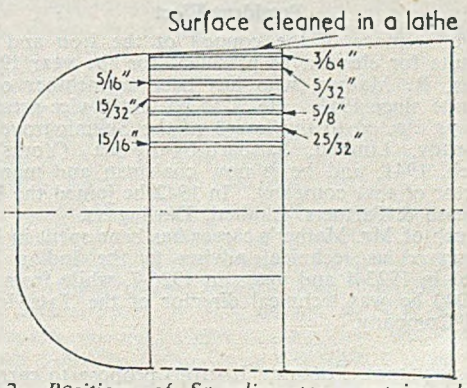


Fig. 2.—Positions of Sampling to ascertain whether Segregation Occurs.

* Reproduced from the *Journal of the Iron and Steel Institute.*

† Professor Hultgren and Mr. Carlsson are at the Royal Institute of Technology, Stockholm.

Silicon Distribution in Cast Iron

melt (3) of cast iron was prepared and allowed to solidify at the same slow rate. 1-mm. layers at different depths beneath the surface were removed in a lathe (Fig. 2) and analysed. The following results were obtained.

Depth beneath surface in mm.	P, per cent.
1	0.33
4	0.34
8	0.32
12	0.32
16	0.32
20	0.32
24	0.34

From the constancy of the phosphorus figures it may be concluded that segregation is practically absent to a depth of 24 mm. The so-called main mass in Table I, therefore, should have the average composition of the melt; in other words, it represents the liquid metal before freezing.

Conclusions

It is seen from Table I that, during freezing, the silicon content of the mother liquor is gradually decreasing and the phosphorus content is increasing. In other words the silicon distribution between austenite and liquid metal as shown in Jass's diagram is qualitatively confirmed. It is assumed that no graphite eutectic had formed, even at the moment of the second dip, but at present this cannot be stated definitely.

REFERENCES

1 H. Jass, "Ueber das System Eisen/Eisensilizid/FeSi/Graphit," Berlin, 1935: Triltsch and Huther.

2 H. Hanemann and A. Schrader, "Atlas Metallographicus," Berlin, 1936: Borntraeger.

Iron and Steel Institute

The annual general meeting of the Iron and Steel Institute will be held in London from May 30 to June 1 next. The council of the institute has accepted the invitation of the Austrian Iron and Steel Institute to hold a special meeting in Austria. This meeting will be held from about September 15 next in conjunction with the meeting of the Institute of Metals to be held in Italy from September 17 to 25.

President Elect

The nominee of the council of the Iron and Steel Institute for election as president for the year 1951-52 is Mr. R. Mather, who has been a member of the Institute since 1913. He is at present a vice-president. He was elected to the board of the Skinningrove Iron Company, Limited, Saltburn-by-the-Sea (Yorks), in March, 1941, and he is now chairman and managing director of that company. In 1942 he joined the board of Pease & Partners, Limited, Darlington.

Much of Mr. Mather's career has bene spent in India. He served as technical adviser to the Indian Tariff Board in 1923-4 and again in 1926-7, while from 1930 to 1940 he was technical director of the Tata Iron & Steel Company.

STONEBRIDGE FOUNDRY LIMITED propose to carry out extensions to their premises at North Circular Road, London, N.W.10.

News in Brief

SOUTHAMPTON CHAMBER OF COMMERCE celebrated its centenary recently. Its 1,000 members represent 280 different trades and professions.

SUFFOLK IRON FOUNDRY (1920), LIMITED, announce that new types of oxygen and acetylene regulators are now in production at their works at Stowmarket.

THE SCOTTISH BUILDING CENTRE, Glasgow, received about 30,000 visitors during 1950 and the number of technical inquiries handled increased by as much as 100 per cent. to 16,000.

TWO CARGO SHIPS, each of about 10,000 tons d.w., have been ordered by the Kassos Steam Navigation Company, Limited, Syra, Greece, from William Doxford & Sons, Limited, Sunderland.

THE INTERIM INDEX prepared by the Central Statistical Office shows that industrial production in 1950 is estimated to have risen 8½ per cent. above the 1949 level, and 40 per cent. above 1946.

THE POSSIBILITY of establishing an industrial trading estate with between 20 and 30 factories on the outskirts of the town was mentioned at a meeting of the Aberdeen Chamber of Commerce on Monday.

LATER THIS YEAR Vickers-Armstrongs, Limited, Walker-on-Tyne, will commence work on a pair of dock gates for the enlarged dock being built at Sunderland for T. W. Greenwell & Company, Limited.

DURING THE Festival of Britain three British Railways locomotives, employing steam, electric and Diesel-electric power respectively, are to be on exhibition at the south end of Charing Cross railway bridge.

TWO TANKERS, each of 18,000 tons d.w., are to be built by Lithgows, Limited, Port Glasgow, for the Anglo-Saxon Petroleum Company, Limited. Machinery for both vessels will be provided by David Rowan & Company, Limited, Glasgow.

THE ENTIRE INTERESTS of Banff Foundry & Engineering Company, Limited, have been acquired by Mr. J. Leslie McRobert, recently of Schoolhill Implement Works, Turriff (Aberdeenshire). The business will continue under the present name.

AN ORDER FOR A 9,600-ton d.w. cargo steamer has been received by John Readhead & Sons, Limited, South Shields, from the Walmer Steamship Company, Limited, London. The company now has nine vessels to build, which ensures work into 1954.

AN ORDER has been received by Ashmore, Benson, Pease & Company, Limited, Stockton-on-Tees, from the Northern Gas Board for a new gasholder for Stockton, to cost about £100,000. The holder will accommodate 3,000,000 cub. ft. of gas and double the town's capacity.

BRITISH INDUSTRIES FAIR ADVANCE CATALOGUES will this week be flown overseas to assist foreign buyers in planning their visits to the 1951 Fair, which will run simultaneously at Earls Court and Olympia in London and at Castle Bromwich, Birmingham, from April 30 to May 11.

THE RAW MATERIALS SECTION of the Newcastle-upon-Tyne branch of George Cohen, Sons & Company, Limited, has been transferred to Coborn Works, Hebburn-on-Tyne (telephone: Hebburn 32331). The machinery section of the Newcastle branch will remain at Trafalgar House, Collingwood Street, Newcastle.

PAPERS TO BE PRESENTED to the Institution of Mechanical Engineers at a general meeting to-morrow include two of interest to makers of cast-iron pipes. These are "Friction Losses in Turbulent Pipe Flow," by L. E. Prosser, B.SC., R. C. Worster, B.SC., and S. T. Bonnington, B.SC., and "New Formulæ for Water Flow in Pipes," by J. S. Blair, D.SC. A third Paper to be presented is entitled "Industrial Design and its Relation to Machine Design," by H. G. Conway, M.A.

Foundry Conditions in Great Britain*

By J. W. Gardom, M.Cons.E., A.M.I.Mech.E., F.I.M.

This Paper is complementary to that recently presented to the Institute on foundry conditions in South Africa[1] and therefore surveys the home industry on the same broad lines as were followed in the earlier work. Training and working conditions as well as other problems facing the industry to-day in this country are given prominence. Developments in foundry equipment, metallurgical control, sand practice, mechanisation, melting practice, and special irons are reviewed.

THE SHORTAGE of skilled foundry labour and the training of apprentices have been favourite topics for presidential addresses and chairmen's remarks for the past 25 or 30 years, and they are likely to remain so for another generation unless the industry makes really serious efforts to attract youths, or to develop equipment which will reduce the demand for skilled labour on heavy classes of work.

Since 1945 there has been not only a shortage of skilled labour but of unskilled operatives as well. This is not peculiar to the foundry industry in this country; all heavy industries are at present faced with this problem for three main reasons. First is the continuance of military service in England, secondly there is the raising of the school leaving age from 14 to 15 years, and thirdly the low birth rate in the years 1930 to 1935 has reduced the number of entrants to industry still further. In these circumstances it is not surprising, therefore, that the lighter and so called more congenial occupations should attract the restricted amount of available labour and, as a result, the heavy industries are suffering. In addition, the foundry industry has suffered from adverse publicity concerning its working conditions and for many years such attacks have gone unanswered.

Adult Trainees

It is now widely realised in the industry that, to overcome the labour shortage, proper schemes of apprentice training must be provided, working conditions must be improved, labour-aiding equipment must be developed and the industry must collectively publicise itself and be prepared to answer adverse criticism of employment conditions.

There is, too, the possibility of developing facilities for adult trainees in the industry. This matter received some attention immediately after the war when a large number of ex-Servicemen were being demobilised, but with the continuance of compulsory military service in Great Britain, it seems that a more permanent arrangement is called for to attract this class of labour and for giving both the practical and technical training required.

Some may believe that an answer could be found in modification of the wages structure; this subject is, however, outside the scope of this Paper, but in any case in Britain foundry wages are calculated as differentials applied to engineering wages, and a very large issue is involved if any alterations are to be made.

* A Paper presented to the South African branch of the Institute of British Foundrymen.

The two Institute reports[2,3] on apprentice training have been accepted as the basis for most of the schemes which have been developed in the industry in the last few years. Larger foundries, where, say, eight, ten or more apprentices are employed, find it relatively easy to ensure proper supervision of the apprentices' practical work and to arrange a full syllabus of training. Such foundries usually operate their schemes of practical training in conjunction with lecture courses at the local technical colleges, most of which now provide day-time courses in addition to evening classes.

Apprentice in the Small Foundry

More difficult problems of apprentice training are met with by the smaller foundries who cannot be expected to make any very special arrangements for only one or two apprentices, and who may undertake only a limited range of work. Furthermore, many of them are remote from the main foundry centres where technical college courses are available, and the apprentices may not, therefore, have the opportunity of part-time further education. The Institute Report[2] puts forward the suggestion that, where possible, small foundries of this type should voluntarily form themselves into groups so that the expense of apprentice instructors could be shared and the range of work on which apprentices could be trained would be increased.

In practice, however, the suggestion has not made much headway so far as the Author is aware, but out of it have developed two Craft Training Centres, which are operated on a national basis. The first was established by the International Meehanite Metal Corporation and is available only to Meehanite licensees, the second was inaugurated at Birmingham about two years ago and is open to apprentices from any foundry in the country whether ferrous or non-ferrous.

This latter centre, which is equipped with a foundry and is known as the National Foundry Craft Training Centre, receives students for one month in every nine-month period for an intensive course of lectures and practical work.

In addition to the need for attracting skilled and unskilled operatives, the industry is also faced with a problem of ensuring an adequate supply of suitably qualified technicians and managers. As was pointed out in the second of the Institute apprentice reports, it was to meet this need that the British Foundry School was established some years prior to the war and this has now been re-opened as the British Foundry College. The syllabus of the

College occupies one to two academic years and students are expected to have at least an elementary knowledge of foundry processes in practice before being accepted. At the conclusion of the course a nationally recognised diploma is given to successful candidates in the final examination.

During the past two years the Institute has organised highly successful foremen's refresher courses, each of a few day's duration, and dealing with both technical and managerial subjects.

No doubt, during the last five years, the industry has made a very serious attempt to provide facilities for proper training, but the main effort has been made by the various trade and technical organisations in the industry and it is to be recorded that they are not as fully supported as they ought to be by all sections of the trade. As in so many other fields, there is far too wide a gap between a small number of leading foundry companies and the average foundry which makes up the industry.

Working Conditions

Since 1944 there have been two Government reports[1, 2] on working conditions in the foundry industry. The first dealt exclusively with dust problems in steel foundries and the second, popularly known as the "Garrett" Report, dealt only with iron foundries, but to a large extent has been accepted by all sections of the trade as though it dealt equally with non-ferrous and steel foundries.

These reports have undoubtedly acted as spurs to the industry's own efforts in improving working conditions in England. They recommend standards which have been agreed to by representatives of the Government, employers' organisations and trade unions, as being practicable and acceptable. Their recommendations are (with a few exceptions) not law, but they are generally expected to form the basis of interpretation of the Factories Act and certain organisations in the industry are pressing for legislation to be based upon the two reports.

Undoubtedly in the matter of working conditions, the industry is suffering from a legacy of the past. Goyn's, in his comparison of the size of the South African and British industry, showed that in Britain the ferrous foundries employ 185,000 persons and produce 3¼ million tons of castings per year. In 1946, D. H. Wood[3] stated that 12½ per cent. of the total iron foundries produce 80 per cent. of the tonnage, and these proportions have probably remained true to-day. They show that the industry is very largely composed of small foundries and this is no doubt due to the facility with which ambitious moulders could establish their own business in the past. Buildings were cheap, second-hand plant was available, and very little capital was required to establish a foundry business to cater for local trade. The result is that to-day many of these small foundries are housed in more or less dilapidated premises which are unsuitable for modernisation to conform with current standards of working conditions.

To-day it is considerably more difficult to establish a business; not only is the cost of plant very much higher, but there are many restrictions, both as regards the choice of site and the carrying out of building work. The Town and Country Planning Act, 1947, empowers local authorities to forbid the establishment of industrial premises in particular areas and it is impossible to have any serious amount of building work carried on without a Government licence. Most of these restrictions are now condemned in some quarters, but in the long run it is thought that they may benefit not only the foundry industry, but the community at large, in ensuring reasonable standards of working conditions and in preventing inter-mixing of residential and industrial areas which is so common a feature of many of the large towns in Great Britain.

Buildings

Since the publication of the "Garrett" Report, the Author has been responsible for conducting a number of surveys of foundries to ascertain the extent of their compliance with the recommendations and, as a result of his experience, he cannot too strongly emphasise that the provision of good buildings is fundamental to satisfactory conditions inside. In poorly constructed buildings, or those not specially designed for foundry operations, it is almost impossible to arrange satisfactory heating, lighting and ventilating systems, or in many cases to accommodate modern items of plant.

Certain items of the "Garrett" Report have already been reviewed by the Author[4] and it is not intended to enlarge upon them in detail here. Some may consider that it was a bad reflection on the industry that publication of this Report should have been required. Others may see in it that the industry was not ashamed of doing its washing in public. However that may be, very substantial capital expenditure has been incurred since 1945 in the provision of washrooms and changing rooms, local exhaust ventilation and similar means of implementing the recommendations of the Report.

It should be noted that, although no such classification of the recommendations is made in the Report, they may be divided broadly into questions of good housekeeping and amenities. Under the former heading are included such proposals as directly affect productivity. These include the ventilation of pouring stations and knock-outs, the provision and maintenance of properly defined and surfaced gangways, good lighting, ventilation, and the orderly storage of raw materials and equipment. Such features as these either increase the production area available in the shop or facilitate the work of the various operatives.

Much attention has, however, been given in Great Britain to the provision of canteens, washrooms, changing rooms and other similar amenities, but there is little concrete evidence that they have any direct bearing on production. Probably the main reason for a foundry's provision of these facilities is to attract and retain labour.

Functions of Equipment

The main functions of mechanical equipment are to increase production per unit area, to utilise

unskilled labour instead of skilled labour and to improve working conditions. Since the war the cost of foundry plant has remained very high and for most items only a very extended delivery time can be obtained. It is frequently suggested that mechanisation or the introduction of mehancial aids, will "reduce labour." In fact, in many installations total labour will actually increase, but, due to a higher production rate, labour cost per piece must be reduced if the installation is to be justified.

It is also misleading to suggest that by the use of equipment working conditions will automatically improve. In practice, it is usually possible to obtain better working conditions in mechanised foundries than in jobbing foundries because, through the segregation of processes, it is possible to maintain ventilation, heating and lighting conditions suitable for the particular processes. It is also possible to arrange convenient working heights and positions to reduce fatigue.

Mechanisation leads to higher production because it entails the breakdown of operations and, therefore, enables "unskilled" labour to become highly skilled in a limited range of operations, and in particular because it tends towards moulding operations being performed throughout the whole of a working day instead of requiring moulders to mould for, say, 5 to 6 hrs. and to cast and to knock-out for, say, 2 to 3 hrs.

The Author does not agree with the view which has been expressed, for example, by some South African foundrymen, that mechanical equipment is not warranted if "cheap" labour is available. It is only in this way that the fullest advantage can be taken of low labour rates. It is also necessary to stress the importance of fully using plant and manning it sufficiently because of its high cost and the fact that it represents a fixed charge.

Mechanical Aids

To obtain maximum advantage from mechanical aids requires considerable experience in the choice of plant and in its layout, but as an example of what can be done the Author would like to quote the case of a malleable-iron foundry in Great Britain which has regular production rate of 90 boxes per hour from one pair of pin-lift moulding machines, the box size being 32 in. by 18 in. by 12 in. by 8 in.

In spite of the increased use of plant during the last ten years, there have been very few outstanding changes in the range of equipment made available by manufacturers and recent reports[8, 9] show that most types of equipment used in America are available in Britain, although undoubtedly the Americans use their plant to a much greater extent.

In recent years there has been increasing realisation that mechanical aids can be introduced into jobbing foundries and for the production of a much heavier class of work than originally envisaged. In one foundry, known to the Author, light castings with average runs of approximately 50 each are now produced on a fully mechanised plant with a power mould conveyor and continuous pouring, while heavier work is produced by semi-skilled labour using a Sandslinger and a system of roller track for the handling of boxes, patterns and moulds. It is estimated that production from this unit, when completed, will be approximately four times that obtained from conventional hand moulding and slinger ramming without the use of the mechanical aids.

Minimum Output for Mechanisation

In order to mechanise an iron foundry fully, it is necessary to ensure a minimum production rate to allow continuous pouring. Assuming the minimum melting rate of a cupola is 25 to 30 cwts. per hour and a yield of good castings of metal poured of approximately 66 per cent. from this the minimum output for full mechanisation is in the neighbourhood of 40 tons per week of good castings requiring 60 tons per week of metal melted.

With charging rates above this order, it is usually necessary or desirable to consider mechanical charging, and although there has been a certain amount of prejudice against mechanical charging of cupolas, the work of Rambush & Taylor[10] and others has convinced the majority of foundrymen that with the correct design of equipment and furnace there can be little technical objection to this system. The choice of equipment is largely governed by the tonnage to be handled, but providing this is adequate and the working-stock bins are arranged correctly in relation to the charging gear, very substantial tonnages can be quite readily handled by one or two men.

In moulding shops the first step towards mechanisation is usually the provision of overhead sand, and this entails a changeover from naturally-bonded sand to a synthetic or semi-synthetic or controlled sand mixture. The principal objects of these systems are, first, to eliminate the time spent by moulders in preparing their own sand, and secondly to reduce defects due to sand by installing central mixing plant which can be readily controlled.

It should be appreciated that, whereas normally these overhead sand systems are installed to serve a line of moulding machines, they can be used to deliver sand to floor or Sandslinger moulding stations and by suitable design of the plant, it may be possible to arrange the delivery of batches of sand of different qualities to suit various classes of work. Much attention has been given to the design of sand handling and preparation plants, especially to prevent the delivery of hot sand to the moulding stations.

Someone said many years ago that it is not the doing of the job that takes the time but the picking up and putting down. Nowhere is this more true than at moulding stations, whether hand ramming or machine moulding is practised. Where machines are installed, however, one is concerned not only with the wasted effort of the operator but with the idle time of the machine, and it has been, with this in mind, that many mechanisms have been developed in recent years for handling boxes, pattern plates, etc., on to the machine and for removing the finished mould from the machines.

In foundries making large moulds where overhead cranes are available, much of the waiting time which normally occurs can be eliminated by the use of wall- or pillar-mounted jib cranes, either power or

hand operated, and there is an increasing realisation in British foundries of the need for providing individual lifting gear for the moulding stations and other operations, thus leaving overhead cranes free for the delivery of materials and the distribution of metal and cores. Similarly, where machine moulding is practised, lifting gear can be designed to suit a particular machine and box design, and one of the most successful devices of this type was described and illustrated by the Author in 1942.[11]

In Goyns' Paper, the reference to the fact that steel moulding boxes are not common in South Africa aroused a great deal of discussion when the Paper was presented to the Annual Conference of the Institute at Buxton. It is admitted that the modern rolled-steel boxes are precision made and if well maintained can eliminate many of the defects attributed to faulty boxes and are also lighter to handle than cast-iron boxes. Too frequently, however, a foundry will instal steel boxes and pay little or no attention to maintenance, with the result that distortion takes place, giving a bad fit on the joint faces, and misaligning the pin centre, thus causing cross joints. There is, therefore, a choice between rolled-steel boxes which are liable to distort, but which are lighter, and the cast-iron box, which will break rather than distort and which is slightly heavier.

Of the two, the Author would prefer the box which breaks, but this is a personal opinion and rolled-steel boxes remain very popular in British foundries for lighter classes of work. Cast aluminium alloy boxes have been developed and, providing a modified alloy is used, they are quite successful, being both rigid and light.

Knock-out Arrangements

There have been welcome developments in mechanically- and electrically-operated shakeout grids suitable for all ranges of work. These grids are normally arranged for a belt conveyor for the return of knocked-out sand to storage bunkers. On small box sizes, a gang of, say, four men can handle several hundred moulds per hour across one of these machines and they have, therefore, not only speeded up the operation of knocking-out but have made possible the centralisation of knock-out operations and so permitted the provision of dust and fume extraction equipment. Full particulars of a highly satisfactory installation have been given by Bolton and Ford.[12]

An alternative shakeout device is the overhead vibratory type which in principle comprises an air hoist suspended from an overhead monorail and equipped and fitted with a vibratory mechanism. Such equipment is less costly than the grid type shake-outs but it is less easy to control the dust and fumes.

It may be of interest to South African foundrymen to know that a very considerable amount of experimental work has been done on the question of dust and fume extraction from knock-outs. The earlier attempts usually tried to apply the suction below the shake-out grids but it was found that such high suction velocities had to be employed to trap the steam and fine dust that erosion of the ducting and fan took place, and with too high a velocity, the lighter particles of coal dust and bonding material were extracter from the sand.

Overhead hoods are not practicable where large work is handled as they do not permit crane approach to the shake-out grids and in any case they permit dust and fume to pass the operator's face. The side hood has, therefore, been developed as the most satisfactory solution to this problem, and where very hot conditions prevail a second duct with induced cold air can be incorporated in the system. Similar remarks apply in respect of fume extraction on central pouring stations on mechanised plants.

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(To be continued)

Rapid Magnetic Machines Jubilee

Rapid Magnetic Machines, Limited, Lombard Street, Birmingham, 12, have just celebrated their golden jubilee with a large gathering of employees, wives and friends at a dinner and social evening at the White Horse Hotel, Birmingham. It was in 1901 that the Rapid company first introduced a drum-separator, carrying a yoke of electro-magnets for extracting ferrous from non-ferrous metals in scrap-yards. The company now manufacture a wide range of magnetic separating and lifting equipment for almost every industry.

The occasion was also marked by the presentation of long-service awards to employees with 25 (or more) yrs. service, the recipients, including one of the directors, being afterwards enrolled as members of the "Rapid" "25" club.

During its half-century of existence, the firm has expanded year by year despite the set-back of being almost totally destroyed during the blitz of 1940-41, and nearly 50 per cent. of the products are exported to all parts of the world. Some 80 different forms of magnetic separators, from tiny machines weighing a few pounds, for examining fine grains, to an 8-ton plant, which removes iron from coal, are produced.

Brass Manufactures Trade

Census of Production Report 1948

A preliminary report on the brass manufactures trade relating to establishments engaged wholly or mainly in the manufacture of brass castings, stampings and pressings, and ancillary trades, and which employed more than ten persons on the average during the year 1948, has been issued.

It is estimated that about 97 per cent. of the total net output of the establishments for 1948 is covered by the returns which have been compiled for inclusion in this report. Any establishments in Northern Ireland are excluded in 1948; no production was recorded there in this trade for 1937 or 1935. The values of production and of materials, fuel and electricity used in 1948 are derived in the following way:—

TABLE I.—*General Summary.*

—	1948.	1937.	1935.
	£000.	£000.	£000.
Value of production (gross output) ..	52,946	18,799	13,665
Cost of materials, fuel and electricity used	24,504	8,850	5,867
Amount paid for work given out ..	666	252	208
Net output	27,776	9,697	7,590
Wages and salaries of persons employed	15,101	—	—
	No.	No.	No.
Average number of persons employed (excluding outworkers)	49,558	43,406	39,282
	£	£	£
Net output per person employed (excluding outworkers)	560	223	193
	No.	No.	No.
Number of establishments	593	—	497

	Output.	Materials, etc.
	£000.	£000.
Total value of sales or purchases	52,615	24,577
Adjustments for stocks and work in progress	+639	−73
	53,254	24,504
Less payment for transport by other firms	308	
	52,946	

TABLE II.—*Stocks of Finished Products, etc., Materials and Fuel in* 1948.

	Beginning of year.	End of year.
	£000.	£000.
Finished products and work in progress ..	4,128	4,707
Materials and fuel	3,963	4,036

CAPITAL EXPENDITURE.

TABLE III.—*Plant, Machinery and Vehicles.*

—	Acquired during 1948.		Disposed of during 1948.
	New.	Secondhand.	
	£000.	£000.	£000.
Plant and machinery ..	972	183	86
Vehicles	101	57	31
Total	1,073	240	117

TABLE IV.—*New Buildings Acquired.*

	1948.
	Amount.
Capital cost of new buildings (including extensions, etc.) acquired during the year, excluding site value ..	£000. 354

TABLE V.—*Employment, Wages and Salaries.*

—	Operatives (average for the year).			Administrative, technical and clerical staff (*a*).			Total.		
	1948.	1937.	1935.	1948.	1937.	1935.	1948.	1937.	1935.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Males :—									
Under 18	1,947	5,508	4,782	203	246	200	2,150	5,754	4,982
All ages	28,933	27,220	23,954	4,094	2,975	2,804	33,027	30,195	26,758
Females :—									
Under 18	1,005	2,959	2,923	461	449	362	1,466	3,408	3,285
All ages	13,663	11,356	10,704	2,738	1,855	1,730	16,401	13,211	12,524
Total :—									
Under 18	2,952	8,467	7,705	664	695	562	3,616	9,162	8,267
All ages	42,596	38,576	34,748	6,832 (*b*)	4,830	4,534	49,428(*b*)(*c*)	43,406	39,282
	£000.			£000.			£000.		
Total remuneration	11,883	—	—	3,218	—	—	15,101	—	—

(*a*) At September 25, 1948, October 16, 1937, and October 12, 1935.

(*b*) There were, in addition, 130 working proprietors (126 males and 4 females) in 1948. Working proprietors are included in the 1937 and 1935 figures.

(*c*) The employers' share of contributions to all National Insurance Schemes payable during the year in respect of these workers amounted to £378,000.

In addition to the employees in the above table the firms in this trade employed 5 male and 66 female outworkers in 1948, the amount paid to them being £6,000. Similar information is not available for 1937 and 1935.

THE INSTITUTION OF PRODUCTION ENGINEERS have appointed Mr. W. F. S. Woodford as secretary, he has been acting secretary since April, 1950.

CHRISTY AND NORRIS LIMITED have had plans prepared for the construction of additional bays to their foundry off Kings Road, Chelmsford, Essex.

Iron and Steel Vesting Procedure

Terms of Compensation Stock to be Announced Later

THE TERMS OF THE British Iron and Steel Stock to be issued as compensation to holders of securities to be vested in the Iron and Steel Corporation of Great Britain on February 15 are not expected to be made known before the evening of that day.

The Iron and Steel Corporation has meantime given formal notice to the holders of the securities of 80 iron and steel companies that in accordance with the nationalisation Act of 1949 those securities will vest in the corporation as from February 15. Certificates of the securities to be vested will in due course be called in for the purpose of being exchanged for certificates of British iron and steel stock, which will be issued by the Bank of England and, to facilitate identification, marked with the index number of the company, from which the stock arises.

Index Numbers

Index numbers are as follow:—

1. Arthur Lee & Sons (Hot Rolling Mills), Limited.
2. Bairds & Scottish Steel, Limited; 3, Barrow Ironworks, Limited; 4, Birchley Rolling Mills, Limited; 5, Briton Ferry Steel Company, Limited; 6, Brown, Bayley Steels, Limited; 7, Brymbo Steel Works, Limited; 8, Burnell & Company, Limited; 9, Byfield Ironstone Company, Limited; 10, Byrlea Steel Works, Limited.
11, Cargo Fleet Iron Company, Limited; 12, Coleby Ironstone Company, Limited; 13, Colvilles, Limited; 14, Consett Iron Company, Limited; 15, Cranford Ironstone Company, Limited.
16. Darlington & Simpson Rolling Mills, Limited; 17, Darwen & Mostyn Iron Company, Limited; 18, District Iron and Steel Company, Limited; 19, Dixon's Ironworks, Limited; 20, Dorman, Long & Company, Limited.
21, Elba Tinplate Company, Limited; 22, English Steel Corporation, Limited; 23, Etna Iron & Steel Company, Limited.
24, Gjers, Mills & Company, Limited; 25, Glamorgan Hematite Iron Ore Company, Limited; 26, Glynhir Tin Plate Company, Limited; 27, Goldendale Iron Company, Limited; 28, Gorse Galvanizing Company, Limited; 29, Guest, Keen & Nettlefolds (South Wales), Limited; 30, Guest Keen Baldwins Iron & Steel Company, Limited.
31, Hadfields, Limited; 32, Hallamshire Steel & File Company, Limited; 33, Hodbarrow Mining Company, Limited; 34, J. J. Habershon & Sons, Limited.
35, John Bagnall & Sons, Limited; 36, John Baker & Bessemer, Limited; 37, John Lysaght's Scunthorpe Works, Limited; 38, John Summers & Sons, Limited.
39, Kettering Iron & Coal Company, Limited.
40. Lanarkshire Steel Company, Limited; 41, Lancashire Steel Corporation, Limited; 42, Lilleshall Iron & Steel Company, Limited; 43, Llanelly Steel Company (1907), Limited; 44, Loddington Ironstone Company, Limited.
45, Millom & Askam Hematite Iron Company, Limited; 46, Monks, Hall & Company, Limited.
47. Nassington Barrowden Mining Company, Limited (formerly Naylor Benzon Mining Company, Limited); 48, Neath Steel Sheet & Galvanizing Company, Limited; 49, New Cransley Iron & Steel Company, Limited.
50, Park Gate Iron & Steel Company, Limited; 51, Partridge, Jones & John Paton, Limited; 52, Patent Shaft & Axletree Company, Limited; 53, Pease & Partners Lingdale Ironstone Mines, Limited; 54, Pease & Partners Normanby Iron Works, Limited.
55. Raine & Company, Limited; 56, Renishaw Iron Company, Limited; 57, Richard Hill, Limited; 58, Richard Thomas & Baldwins, Limited; 59, Round Oak Steel Works, Limited.
60. Samuel Fox & Company, Limited; 61, Santon Mining Company, Limited; 62, Sheepbridge Company, Limited; 63, Sheffield Forge & Rolling Mills Company, Limited; 64, Shelton Iron, Steel & Coal Company, Limited; 65, Skinningrove Iron Company, Limited; 66, Smith & McLean, Limited; 67, South Durham Steel & Iron Company, Limited; 68, Stanton Ironworks Company, Limited; 69, Staveley Iron & Chemical Company, Limited; 70, Steel Company of Wales, Limited; 71, Stewarts and Lloyds, Limited.
72, Templeborough Rolling Mills, Limited; 73, Thos. Firth & John Brown, Limited.
74, Ullcoats Mining Company, Limited; 75, United Steel Companies, Limited; 76, Upper Forest & Worcester Steel & Tin Plate Works, Limited.
77, Whitehead Iron & Steel Company, Limited; 78, William Beardmore & Company, Limited; 79, Wolverhampton Steel & Iron Company (1946), Limited; 80, W. Wesson & Company, Limited.

Payment of interest or dividend due before February 15 will be made by the companies concerned. Where securities have been drawn before February 15, for repayment on or after that date, the rights to the redemption moneys vest in the corporation and holders will be compensated by the issue of Iron and Steel stock.

List of Agreed Values

The Ministry of Supply has issued a list of the iron and steel securities for which compensation values have already been agreed with stockholders' representatives. The compensation value of the 87 securities in the list is just over £177,000,000. Altogether, 146 securities have to be valued. The terms of compensation, subject to agreement with stockholders' representatives, are based on quotations in the Stock Exchange official daily list on certain dates in 1945 and 1948. Where the securities were not quoted on the relevant dates, compensation values are negotiated with stockholders' representatives. The 87 securities agreed consist of 54 quoted and 33 unquoted. The remaining 59 securities are all unquoted except one. Following is the list:—

LOAN CAPITAL (PER £100 STOCK)

Cargo Fleet 4% 1st mortgage debenture, £97 10s.
Consett Iron 4½% debenture, £102 10s.
Dorman, Long 4% first mortgage perpetual debenture, £102 10s.; 4% redeemable prior lien, £102 5s.
Guest Keen Baldwins 4% first mortgage debenture, £101 7s. 8d.
Park Gate 4½% first mortgage debenture, £101.
Richard Thomas & Baldwins 4% redeemable first mortgage debenture, £103 8s. 4d.; 3½% loan, £101.
South Durham 4% mortgage debenture, £100 10s.
Stanton Ironworks 4% debenture, 1958, £100 10s.; 1948/78, £100 10s.
Stewarts and Lloyds 4% debenture, £104 3s. 4d.; secured loans, £104.
Firth & Brown 5½% debenture, £97 10s.; 5½% mortgage, £106.

PREFERENCE STOCKS AND SHARES (£1 UNLESS OTHERWISE STATED)

Bairds & Scottish 6% cumulative, 25s.
Birchley Rolling Mills 5% (tax free) cumulative, 35s.
Briton Ferry 5% (tax free up to 5s.) cumulative, 26s. 3d.
Burnell & Company 7½% cumulative participating, 40s.
Colvilles 5½% cumulative, 26s. 6d.
Consett Iron 8% cumulative, 35s. 3d.
Darlington & Simpson 5½% first cumulative, 25s. 7d.; 6% second cumulative, 25s.
Dorman, Long 6½% non-cumulative first, 27s. 6d.; 8% non-cumulative second, 31s. 2d.
Hadfields 4½% cumulative, £10, £10 7s. 6d.
J. J. Habershon 6% first, 24s.; 10% second, 40s.
John Baker & Bessemer, 4½% cumulative second, 21s.
John Summers 4½% cumulative, 23s.
Lanarkshire Steel 6% cumulative, 25s.
Lancashire Steel 5% cumulative redeemable first, 22s.; 5½% non-cumulative redeemable second, 21s. 3d.
Millom & Askam 7% cumulative participating, 25s. 6d.
Monks, Hall 5% cumulative, £5. £5 15s.
Renishaw Iron 7% cumulative, 25s.; 5% redeemable cumulative 1s., nil.
Richard Thomas & Baldwins 6½% cumulative participating, 34s. 10d.
Sheepbridge "A" 5% cumulative participating 10s., 25s. 2.81d.; "B" 5% cumulative participating 10s., 26s. 4.2d.
Smith & McLean 5% cumulative £10. £11 10s.
South Durham 6% cumulative, 24s. 11d.
Stewarts and Lloyds 6% cumulative first, 31s. 9d.; 10% cumulative second, 48s. 3d.; 5% cumulative third, 25s. 8d.
Firth & Brown 6% cumulative, 28s. 9d.; 5% (tax free) cumulative, 36s. 3d.
United Steel 4½% cumulative, 22s. 10d.
William Beardmore 5½% cumulative, 26s. 6d.

ORDINARY STOCKS AND SHARES (£1 UNLESS OTHERWISE STATED)

Arthur Lee (Hot Rolling Mills), 140s. 9d.
Bairds & Scottish, 36s. 6d.; Birchley Rolling, 120s.; Briton Ferry, 47s. 11d.; Brown Bayley, 70s.; Burnell & Company 5s., 25s.
Cargo Fleet Iron, 17s. 6d.; Colvilles, 38s.; Consett Iron 6s. 8d., 15s. 3d.
Darlington & Simpson, 32s. 9d.; District Iron & Steel 5s., 50s.; Dorman, Long, 33s. 1d. (preferred 54s. 9d.).
Etna Iron & Steel, 66s. 8d.
Gjers, Mills, 33s.; Goldendale Iron 5s., 7s. 6d.
J. J. Habershon, 85s.; John Bagnall, 66s. 8d.; John Summers, 34s.
Lancashire Steel "A" and "B," 35s.
Millom & Askam 5s., 10s. 6d.
Park Gate 10s., 14s.; Partridge Jones, 19s. 10d.
Renishaw Iron 1s., 8s. 6d.; Richard Hill 5s., 17s. 4d.; Richard Thomas & Baldwins 6s. 8d., 15s. 3d.
Sheepbridge 10s., 28s. 2.725d.; South Durham, 32s. 11d. ("B" 10s. 9d.); Stewarts and Lloyds deferred, 57s. 4d.
Templeborough Rolling Mills, 140s.; Thos. Firth & Brown "A" and "B," 78s. 2d.
United Steel, 30s. 4d.
Whitehead Iron & Steel, 123s. 7d.; William Beardmore, 53s. 8d.; Wolverhampton Steel & Iron, 88s.

Obituary

PROFESSOR THOMAS TURNER

We regret to announce the death of Emeritus Professor Thomas Turner, which occurred at his home at Leatherhead last week at the age of 89. Born in 1861, he was educated at Edgebaston and at the Royal School of Mines at South Kensington, where he won the *de la Beche* medal. He returned to Birmingham as demonstrator in chemistry at Masons College, where he became lecturer in metallurgy in 1887. In 1902 he was appointed Professor of Metallurgy in the University of Birmingham. He was a past president of the Institute of Metals and a Bessemer Medalist of the Iron and Steel Institute. In foundry circles, his association started with the publication of the iron silicon diagram which formed the basis for a study of grey-iron metallurgy. His connection with the Institute of British Foundrymen officially started in 1910, but he was active from its creation in 1904. From the Institute he has received all its major awards —honorary membership; the Oliver Stubbs and the E. J. Fox medals. The American Foundrymen's Society also recognised his great achievements by the award of the Seaman medal. His major publications were the Metallurgy of Iron; Practical Metallurgy and Lectures on Iron Founding. The work accomplished by Professor Turner is of such a basic character, that so long as the metallurgy of iron is studied his name will be perpetuated.

MR. T. VOWLES has died at the age of 53. He was a co-founder of the Vowles Aluminium Foundry Company, Limited, Bank Street, West Bromwich, a quarter of a century ago, and was latterly chairman of the board of directors.

SIR CHARLES MANDER, Bt., one of the best known public men in the Midlands, died suddenly on January 25. He was twice Mayor of Wolverhampton and a member of many business, educational, and charitable organisations. Sir Charles was 66.

MR. HERBERT WILLIAM FRETSON PEACE, who for many years was managing director of Samuel Peace & Sons, Limited, crucible-steel manufacturers, etc., of Sheffield, has died at the age of 77.

DR. O. H. MAVOR, better known as James Bridie, the playwright, died last week, at the age of 63. He was a brother of Dr. J. B. Mavor, chairman, and Mr. E. I. Mavor, joint managing director, of Mavor & Coulson, Limited, mining machinery manufacturers, of Glasgow.

Hadfields' Capital Reduction

In the Chancery Division, last week, Mr. Justice Wynn-Parry confirmed a reduction of the capital of Hadfields, Limited, East Hecla Works, Tinsley, Sheffield, from £2,500,000 to £2,170,000 by returning 1s. 6d. per unit of ordinary stock of 10s. to be satisfied by transferring to each holder one share of 2s. 6d. credited as fully paid up in the capital of Millspaugh, Limited, a subsidiary, and by reducing the nominal value of 2,243,568 unissued ordinary shares from 10s. to 8s. 6d.

Mr. J. B. Lindon, KC, who appeared with Mr. H. Lightman, for the company, said the return of capital was occasioned by the operation of the Iron and Steel Act, 1949, and what the reduction was designed to effect was the hiving-off of certain parts of the company's undertaking which it would not be necessary to transfer to the Iron and Steel Corporation under the Act. The capital of the company was £2,500,000 in £300,000 preference stock and £1,078,216 ordinary stock which had been converted from shares of 10s. into 10s. units of stock. There were, accordingly, 2,156,432 of these units. There were also 2,243,568 unissued ordinary shares of 10s. The preference stock was unaffected by the reduction and the holders had passed a resolution sanctioning the reduction.

The 1s. 6d. per 10s. unit to be returned was to be satisfied by a distribution of one fully-paid share of 2s. 6d. in Millspaugh, Limited, which would contain within it the assets which it was desired to hive-off from the assets to be vested in the Iron and Steel Corporation. Following the reduction, the capital was to be increased to £2,499,987 by the creation of 776,440 new ordinary shares of 8s. 6d. each. The resolution had been passed unanimously by the ordinary shareholders.

The company carried on the business of iron and steel producers mainly through nine wholly owned subsidiary companies, including Raybould, Limited, Millspaugh, Limited, and Hargreaves & Jennings, Limited. The principal business of Millspaugh, Limited, was the manufacture of paper-making machinery and it was not one of the companies to be acquired by the Iron and Steel Corporation. It was proposed, in effect, to transfer to Millspaugh, Limited, all the shares in Raybould, Limited, and certain freehold land and factories in consideration of the allotment by Millspaugh, Limited, of a large number of fully-paid shares in that company.

If it were not for these proposals, large securities of Hadfields, Limited, would pass to the Iron and Steel Corporation on February 15. If the reduction was confirmed the operation would involve the exclusion of the shares in Millspaugh, Limited, which controlled Hargreaves & Jennings, Limited.

The proposals had been approved by the Minister of Supply subject to certain conditions. One was that the price payable to the ordinary stockholders for their holdings under the Iron and Steel Act was to be reduced from £1 10s. 10d. of British Iron and Steel stock for each 10s. unit to £1 6s. 3d. per unit. In effect, he agreed that the assets to be excluded from the operation of the Act were to be taken to be of the value of 4s. 7d. per unit. Counsel added that Hadfields, Limited, had been carried on very successfully since 1935, when a reduction of capital was made owing to the conditions existing at that time.

An affidavit by Lord Dudley Gordon, chairman of the board of directors of Hadfields, Limited, was read in support of the petition.

Mr. Justice Wynn-Parry: "The preference shareholders are only really technically interested in this. This is really, in a way, an advance repayment to the holders of ordinary stock. I am satisfied on the evidence and I will confirm the reduction."

Charging Machine for South Wales

A 30-ton ground charger for feeding scrap to the steel furnaces, and the largest ever produced in Britain, has been completed in the Sir William Arrol crane works and is destined for a Welsh steel mill. Utilising one of the biggest single steel castings ever used for this work, the charger has been under construction for the last two years. Its completion coincides with the building of the new Abbey Steel Works at Port Talbot, South Wales.

The charger is the first of seven of equal size to be produced by the firm for steelworks throughout the country. Its function is to carry scrap from the stock-piles and, by means of a long arm and bucket, charge the furnaces. To prepare for the journey of this giant load from Glasgow to South Wales, police throughout the route have had to be advised. The lorry moving the charger will have to carry a load of 30 tons measuring some 17 ft. at its widest part; it is expected that the journey south will take at least two weeks. Construction of the remaining six chargers is proceeding rapidly and these are expected to be delivered at the rate of one every two months.

Engineering Firms' Capital Needs

Grave concern is being caused by the shortage of liquid resources in small- and medium-size engineering firms, the latter finding difficulty in financing the inflated price of raw materials, so that debts are piling up and extension of credits is a process like a snowball. Many firms are endeavouring to carry on with a limited bank overdraft which does not allow adequate scope.

The Engineering Industries Association suggests that Government departments, local authorities, and the nationalised industries should settle their accounts more promptly, while the Inland Revenue authorities might adopt a more lenient course in collecting taxes. Big contractors might grant more extended credit to sub-contractors. Policy of the Capital Issues Committee should be more flexible. The association emphasises that the need for Government economies with a view to the possibility of reducing taxation on industrial profits has never been more urgent. Productivity of the engineering industry must not be hampered when its responsibilities in relation to rearmament and exports are greater than ever before.

Steel Company of Wales

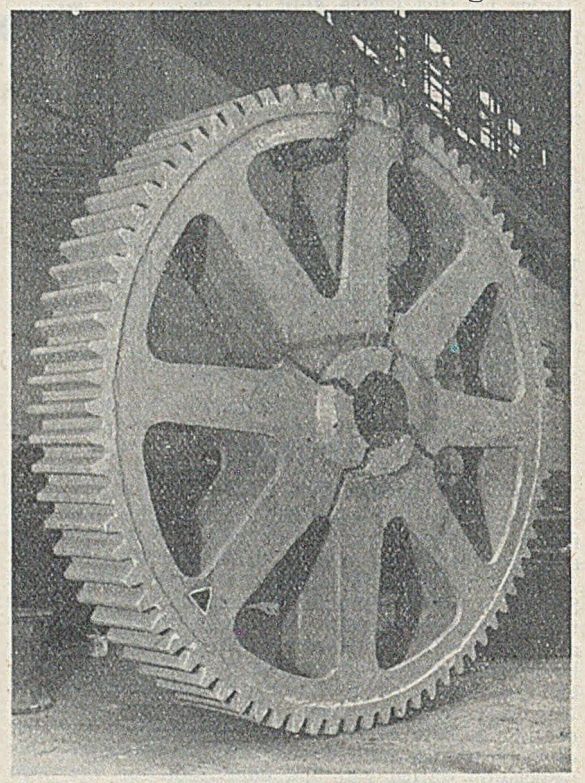
Up to September 30, 1950—the end of the company's financial year—£41,350,011 of the £63,000,000 sanctioned by the board of teh Steel Company of Wales, Limited, for the Margam development scheme had been incurred.

Announcing in his annual review that the necessity of providing the required additional money had been reported to the Iron and Steel Corporation, the formation of which had brought to an end the possibility of securing finance through normal channels, the chairman, Mr. E. H. Lever, states that a substantial amount of money is likely to be required over the next few years for further developments.

Since the end of the financial year one of the new blast furnaces and the slabbing mill have started production, and the rest of the plant should commence operation this year, if raw material shortages allow.

Largely owing to increased materials costs and wage rates, but partly to changes in design and alterations to plant, the total cost of the new developments would be appreciably higher than was estimated.

Ten-ton Wheel Casting



Given three weeks in which to make the 10-ton wheel shown in the illustration, which was a replacement casting urgently required by a firm of sugar manufacturers in Mauritius to enable them to deal with this year's sugar crop, David Brown-Jackson Limited, of Manchester, completed and despatched the job in fourteen days. Machine moulded in cast steel, the wheel is 13 ft. 6 in. dia. and has a 20-in wide face. Dividing was carried out on special machines developed by the Company several years ago and, as may be observed from the photograph, the pitch and finish of the teeth are excellent.

Sheffield Metallurgical Association

Mr. E. T. Gill, of the Climax Molybdenum Company of Europe, Limited, took over the presidential chair of the Sheffield Metallurgical Association from Dr. J. White, University of Sheffield, at the annual general meeting in the Grand Hotel, Sheffield, on January 23. The Association has been obliged recently to vacate the previous premises in West Street, and Mr. Gill asked "Where do we go from here?" during his presidential address. A discussion followed, in which members made various suggestions as to a future "home." The membership is now 243. The following officers and members of council assumed office for the 1951 session:—President, Mr. E. T. Gill; vice-presidents, Messrs. E. W. Colbeck, H. Hicks, F. H. Saniter, and T. H. Arnold; hon. treasurer, Mr. T. H. Arnold; hon. secretary, Mr. J. Burnett; hon. librarian, Mr. T. G. Chadwick; hon. proceedings secretary, Mr. H. W. Pinder. The council now comprises:—Messrs. H. Allsop, B. Bagshawe, R. C. Baker, P. Jubb, S. Harrison, G. Robinson, J. H. Spalton, G. E. Speight, B. E. G. R. Wilkinson, and Dr. J. Rait.

Imports and Exports of Iron and Steel in December

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in December. Figures for the same month in 1949 are given for purposes of comparison, respective totals for the year 1950 and of 1949 are also included.

Total Exports of Iron and Steel.

Destination.	Month ended December 31.		Whole of	
	1949.	1950.	1949.	1950.
	Tons.	Tons.	Tons.	Tons.
Channel Islands	869	580	11,725	8,518
Gibraltar	115	67	1,785	1,599
Malta and Gozo	108	263	4,857	4,112
Cyprus	813	388	5,010	8,505
British West Africa	7,440	8,741	87,754	93,540
Union of South Africa	11,873	10,618	141,078	177,044
Northern Rhodesia	2,443	1,385	21,291	27,573
Southern Rhodesia	3,495	1,997	51,087	65,770
British East Africa	6,370	4,470	87,904	95,220
Mauritius	891	640	8,311	8,767
Bahrein, Kuwait, Qatar and Trucial Oman	1,206	397	20,226	7,068
India	5,762	7,392	81,136	99,234
Pakistan	3,884	7,477	38,768	105,543
Malaya	6,879	4,964	60,077	75,422
Ceylon	2,809	2,620	26,903	36,484
North Borneo	198	1,002	9,310	7,569
Sarawak	109	55	1,857	809
Hongkong	4,463	8,338	36,541	55,997
Australia	25,853	44,925	197,383	450,403
New Zealand	15,334	12,429	120,278	177,486
Canada	3,224	18,138	66,092	226,083
British West Indies	5,540	5,240	62,455	63,284
British Guiana	205	340	4,500	6,853
Anglo-Egyptian Sudan	1,413	491	15,059	16,492
Other Commonwealth countries	2,214	912	12,425	13,901
Irish Republic	6,841	8,277	69,411	100,552
Russia	170	—	9,114	530
Finland	7,219	7,510	77,034	74,600
Sweden	5,538	7,632	60,393	90,579
Norway	3,785	5,122	65,969	83,771
Iceland	348	206	7,743	4,372
Denmark	7,423	6,800	89,551	107,654
Poland	41	87	1,108	1,632
Germany	81	36	562	949
Netherlands	7,789	5,408	109,004	77,245
Belgium	1,395	1,023	11,574	14,139
Luxemburg	500	6	6,378	400
France	1,772	2,664	32,224	25,381
Switzerland	934	950	12,082	10,943
Portugal	1,085	606	18,750	18,850
Spain	406	186	9,612	6,767
Italy	201	1,421	3,192	12,953
Hungary	87	11	1,070	341
Greece	490	397	5,184	7,561
Turkey	1,025	751	17,844	9,388
Indonesia*	2,243	898	25,998	11,436
Netherlands Antilles	1,071	788	8,806	8,515
Belgian Congo	172	93	1,712	2,008
Angola	50	78	5,837	2,139
Portuguese East Africa	449	413	4,630	4,837
Canary Islands	184	215	2,985	2,248
Syria	387	50	2,233	1,739
Lebanon	506	707	27,653	12,203
Israel	1,694	3,146	17,211	27,511
Egypt	6,398	4,166	58,037	59,795
Morocco	436	1,156	2,014	5,789
Saudi Arabia	465	30	6,571	2,229
Iraq	4,010	2,777	51,070	36,205
Iran	18,125	7,346	162,910	99,585
Burma	707	720	9,297	12,030
Thailand	467	1,545	5,937	11,100
China	175	2,688	2,874	8,715
Philippine Islands	808	224	4,014	8,757
USA	1,321	19,399	5,527	73,601
Cuba	25	690	460	2,786
Colombia	448	712	6,298	6,710
Venezuela	2,694	1,800	52,955	30,854
Ecuador	171	192	2,860	3,880
Peru	746	1,256	7,536	12,137
Chile	656	2,813	7,136	17,891
Brazil	2,365	3,331	19,489	33,651
Uruguay	498	2,240	8,140	11,855
Argentine	7,299	3,580	73,974	63,605
Other foreign countries	1,821	2,732	14,747	34,652
TOTAL	217,040	258,759	2,382,670	3,090,346

* Includes Netherlands New Guinea in 1949.

Total Imports of Iron and Steel.

From	Month ended December 31.		Whole of	
	1949.	1950.	1949.	1950.
	Tons.	Tons.	Tons.	Tons.
Australia	2,526	13	14,280	64
Canada	4,641	3,304	64,391	39,219
Other Commonwealth countries and Irish Republic	2,062	100	25,123	24,602
Sweden	879	1,398	16,134	14,001
Norway	1,061	3,728	26,553	52,108
Germany	3,911	3,454	25,137	70,771
Netherlands	7,320	2,277	94,745	44,564
Belgium	11,449	6,146	335,858	95,383
Luxemburg	5,580	2,545	164,150	42,028
France	22,887	30,229	207,537	302,610
Austria	443	51	32,328	3,427
USA	5,438	1,172	242,972	62,125
Other foreign countries	451	132	3,712	6,389
TOTAL	68,657	54,549	1,252,920	757,291
Iron ore and concentrates—				
Manganiferous	—	—	2,976	10,876
Other sorts	685,119	639,992	8,680,921	8,402,038
Iron and steel scrap and waste, fit only for the recovery of metal	138,723	82,203	2,097,162	1,962,345

Exports of Iron and Steel by Product.

Product.	Month ended December 31.		Whole of	
	1949.	1950.	1949.	1950.
	Tons.	Tons.	Tons.	Tons.
Pig-iron	2,145	3,348	9,881	35,403
Ferro-alloys, etc.—				
Ferro-tungsten	114	88	911	1,171
Spiegeleisen ferro-manganese	552	100	9,207	2,520
All other descriptions	92	119	1,034	1,548
Ingots, blooms, billets, and slabs	143	865	2,904	6,730
Iron bars and rods	379	1,018	6,839	5,514
Sheets and tinplate bars, wire rods	254	1,728	3,358	20,898
Bright steel bars	2,618	5,085	20,705	47,275
Other steel bars and rods	16,444	25,772	176,446	271,510
Special steel	1,422	1,433	14,974	15,163
Angles, shapes, and sections	11,186	18,283	117,160	166,698
Castings and forgings	456	482	7,991	7,888
Girders, beams, joists, and pillars	2,877	4,100	30,950	67,256
Hoop and strip	6,605	11,726	56,041	122,711
Iron plate	588	156	7,741	2,572
Tinplate	18,388	20,523	194,664	247,430
Tinned sheets	119	225	3,450	2,820
Terneplates, decor. tinplates	18	73	472	893
Other steel plate (min. ¼ in. thick)	16,735	25,292	221,243	329,940
Galvanised sheets	9,055	8,168	92,835	113,313
Black sheets	12,797	11,523	138,700	138,588
Other coated plate	439	588	7,084	11,760
Cast-iron pipes up to 6-in. dia.	4,045	5,417	76,475	76,700
Do., over 6-in. dia.	5,709	4,246	82,335	78,066
Wrought-iron tubes	32,435	32,089	337,591	354,781
Railway material	24,481	22,469	201,701	309,891
Wire	5,017	6,931	56,104	86,048
Cable and rope	2,533	4,116	30,632	35,050
Netting, fencing, and mesh	1,312	2,314	20,016	19,433
Other wire manufactures	1,204	3,549	13,286	31,758
Nails, tacks, etc.	415	1,087	6,608	7,448
Rivets and washers	563	558	8,841	8,257
Wood screws	270	300	3,444	4,038
Bolts, nuts, and metal screws	2,129	2,076	26,509	30,628
Stoves, grates, etc. (excl. gas)	749	789	9,551	11,972
Do., gas	245	224	2,648	2,719
Baths	1,199	903	10,713	13,668
Anchors, etc.	690	570	9,938	8,879
Chains, etc.	747	766	10,358	10,302
Springs	562	529	8,109	8,295
Hollow-ware	7,323	5,351	83,503	86,099
All other manufactures	20,186	23,690	259,599	285,504
TOTAL	217,040	258,759	2,382,670	3,090,346

Mond Nickel Changes

Several changes on the board of the Mond Nickel Company, Limited, have been made following the resignation at the end of last year of Sir William Griffiths, who had been chairman and managing director since 1945. In the first place, the position of chairman and managing director is no longer to be a joint office. L. H. Cooper, the new chairman, joined the company in 1926, and was its secretary for 11 years prior to his election to the board in 1945. In October, 1947, it was announced that Mr. Cooper had been elected assistant secretary and assistant treasurer of the International Nickel Company of Canada, Limited, these appointments bringing him additional duties, for he retained his seat on the Mond Nickel board. He has also served on the boards of Birlec, Limited, industrial furnace builders, of Birmingham, Henry Wiggin & Company, Limited, manufacturers of nickel and nickel alloys, also of Birmingham (being also secretary of this company), Mond Nickel (Retirement System) Trustees, Limited, and Tareni Colliery Company, Limited.

The office of managing director has gone to L. K. Brindley, who became a director of the Mond Nickel Company towards the end of 1948. Formerly a director and manager of Brandeis, Goldschmidt & Company, Limited, the London metal merchants, early in 1943 Mr. Brindley accepted an invitation to be vice-president of the Falconbridge Nickel Mines, Limited, of Toronto.

Three new directors have been appointed to the Mond Nickel board—I. A. Bailey, L. B. Pfeil, and A. G. Ramsay. Early in 1946, Mr. Bailey resigned his position as general manager of the Mond Nickel Company's refinery at Clydach, South Wales, which he had held since 1936, on his appointment as managing director of Henry Wiggin & Company, Limited.

In the board changes now announced, G. Archer and A. Parker Hague continue as directors of the company.

It will be recalled that, following the announcement of his resignation, Sir William Griffiths was reported to have said: "I do not want to add to the statement at the moment for a variety of reasons which will appear in due course, but it has nothing to do with steel nationalisation and there has been no disagreement with the company."

English Steel Valuation

Valuation for nationalisation purposes of English Steel Corporation, Limited, owned by Vickers, Limited, and Cammell, Laird & Company, Limited, has been agreed at over £22,000,000 between Sir Alan Rae Smith, as stockholders' representative, and the Ministry of Supply. An official notice issued by Vickers and Cammell Laird says that as discussions for retention of some part of the company's assets and undertakings are still in progress, it will not be possible for some time for either Vickers or Cammell Laird to give any indication of the manner in which the compensation moneys received will be dealt with.

The three classes of English Steel securities have been valued as follow:—£1 7 per cent. preferred ordinary (issued £2,228,889), £1 15s. per share; £1 deferred ordinary (issued £1,131,120), £15 5s. per share; £100 6 per cent. 1st mortgage debenture (issued £850,934), £115 per £100 stock. On this basis, the preferred ordinary shares are worth £3,900,555, the deferred ordinary £17,249,580, and the debentures £978,574, a total of £22,128,709.

Private Generating Plant

The relaxations of restrictions made in 1948 to enable industrialists to instal private generating plant should they so desire are to be extended until March 31, 1956. Subsequent to the 1947 fuel crisis the Government encouraged the installation of private generating plant, mainly oil-driven, by commercial and industrial establishments. These plants, which were relatively small, were not intended to deal with the whole of the power requirements of the establishments they served, but to supplement supplies taken from the electricity supply industry.

The provision of an electricity supply that is only partly or occasionally used is relatively uneconomic from the standpoint of the supplier. In pursuance of Government policy, however, the electricity supply industry agreed to the waiving of conditions under electricity supply contracts which prevented the installation or use of private generating plant, and granted concessions in charges for standby supplies required in association with the use of such plant.

In 1948, the British Electricity Authority and the 14 Area Electricity Boards reviewed the position, and consulted the Federation of Briitsh Industries. It was decided then to continue the relaxations and concessions up to March 31, 1952, by which time it was hoped the power-plant shortage would have been substantially overcome. In view of the continuing shortages, it has now been decided further to continue these arrangements.

Canadian Steel Output

Canada increased her production of pig-iron and steel ingots and castings in November and in the first 11 months of 1950 compared with the same period of 1949.

The Dominion Bureau of Statistics reports that the month's output of pig-iron amounted to 208,301 net tons, as compared with 157,327 tons in November, 1949, bringing the aggregate for the 11-month period to 2,111,563 net tons, as against 1,982,350 tons in the same months of 1949. Production of steel ingots and castings in November totalled 289,488 net tons, compared with 259,722 tons a year earlier. Cumulative output for the 11-month period totalled 3,092,889 net tons, as compared with 2,922,981 tons in 1949.

The output of ferro-alloys in November increased to 16,920 net tons from 14,758 tons a year ago, but was lower in the 11-month period, 166,234 net tons being produced, against 199,750 tons in the same period of 1949.

Anglo-Canadian Ore Agreement

Agreement on major points for a long-term contract with British interests for the sale of iron ore is announced from Montreal by Mr. L. A. Forsyth, president of the Dominion Steel & Coal Corporation, Limited. The agreement contemplates annual shipments of a million tons of ore gross over a five-year period from 1952.

MR. W. H. SMITH, MR. W. MARSHALL and MR. J. HILL, superintendents at Ley's Malleable Castings Company, Limited, Derby, left last week for a five-week visit to malleable iron founders in the United States.

AMONG ITEMS considered to be in short supply which now need export permits in Canada are cobalt, tungsten, and iron and steel fencing posts. Permits for shipment to countries other than the US are also required for sulphur and white mineral oil.

Pig-iron and Steel Production

MONTHLY STATISTICAL SUMMARY

The following particulars of pig-iron and steel produced in Great Britain have been extracted from the Statistical Bulletin for December, issued by the British Iron and Steel Federation. Table I gives the production of pig-iron and ferro-alloys in November, with the number of furnaces in blast; Table II. production of steel ingots and castings in November, and Table III. deliveries of finished steel. Table IV summarises activities during the previous six months.

TABLE I.—*Weekly Average Production of Pig-iron and Ferro-alloy during November. (Thousands of Tons.)*

District.	Furnaces in blast 2.12.50	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derby., Leics., Notts., Northants, Essex	25	0.7	18.0	24.4	1.1	—	44.3†
Lancs. (excl. N.W. Coast), Denbigh, Flints, and Cheshire ..	7	—	7.7	—	—	1.3	9.0
Yorkshire (incl. Sheffield, excl. N.E. Coast) ..	14	—	24.3	—	—	—	24.3
Lincolnshire ..	23	8.5	37.1	0.4	—	1.4	47.4
North-East Coast ..	9	0.8	13.3	2.6	—	—	16.7
Scotland	9	—	9.4	1.6	—	—	11.0
Staffs., Shrops., Worcs., and Warwick ..	8	4.2	20.1	—	—	—	24.3
S. Wales and Monmouthshire	7	16.0	—	0.1	—	—	16.1
North-West Coast	102	30.2	129.9	29.1	1.1	2.7	193.1†
Total ..	101	30.7	130.8	28.6	1.0	2.8	193.9
October, 1950 ..	103	29.1	122.5	31.3	1.7	2.8	187.4
November, 1949*							

* Five weeks. † Incl. 100 tons of direct castings.

TABLE III.—*Weekly Average Deliveries of Non-alloy and Alloy Finished Steel. (Thousands of Tons.)*

Product.	1948.	1949.	1949. Nov.*	1950. Oct.	1950. Nov.*
Non-alloy Steel :—					
Heavy rails and sleepers	8.9	9.8	11.9	11.3	12.3
Heavy and medium plates	36.1	39.2	41.4	41.3	43.1
Other heavy prod.	34.7	36.1	38.9	40.0	43.6
Light rolled prod.§	59.7	46.4	49.4	52.6	53.7
Hot-rolled strip ..		17.1	17.5	22.1	21.1
Cold-rolled strip ..	4.8	4.9	5.4	5.9	6.4
Bright steel bars ..	6.1	5.8	5.9	7.3	7.3
Sheets, coated and uncoated ..	26.3	27.6	30.9	32.4	32.1
Tin-, terne- and blackplate ..	13.5	13.7	15.4	14.2	14.5
Tubes, pipes and fittings	15.1	18.5	20.1	21.4	21.9
Wire	12.8	15.0	16.1	17.7	17.1
Tyres, wheels, axles	3.9	4.1	4.4	3.1	4.1
Forgings‡‡	2.4	2.4	2.6	2.3	2.4
Castings	3.5	3.6	3.8	3.8	3.8
Total	227.8	244.2	263.7	275.4	283.4
Alloy Steel† :—					
Tubes and pipes ..	0.4	0.6	0.7	0.7	0.6
Bars, plates, sheets, strip and wire ..	4.7	4.7	4.9	5.8	6.1
Forgings‡‡	0.5	0.7	0.8	0.6	0.7
Castings	0.7	0.7	0.8	0.9	0.9
Total	6.3	6.7	7.2	8.0	8.3
Total deliveries from U.K. prod.‡ ..	234.1	250.9	270.9	283.4	291.7
Add from other U.K. sources	11.3	11.7	11.2	8.0	8.6
Imported finished steel	3.4	7.7	2.3	2.1	3.1
	248.8	270.3	284.4	293.5	303.4
Less intra-industry conversion ..	35.0	39.1	39.1	42.3	43.0
Total deliveries	213.8	231.2	245.3	251.2	260.4

† Excl. high-speed steel. ‡ Incl. finished steel prod. in the U.K. from imported ingots and semi-finished steel. ‡‡ Excl. drop forgings. § Excl. wire rods, but incl. ferro-concrete bars.

TABLE II.—*Weekly Average Production of Steel Ingots and Castings in November. (Thousands of Tons.)*

District.	Open-hearth. Acid.	Open-hearth. Basic.	Bessemer.	Electric.	All other.	Total. Ingots.	Total. Castings.	Total Ingots and castings.
Derby, Leics., Notts., Northants and Essex ..	—	3.2	10.9 (basic)	1.2	0.2	14.8	0.7	15.5
Lancs. (excl. N.W. Coast), Denbigh, Flints., and Cheshire	1.7	23.2	—	1.5	0.5	25.9	1.0	26.9
Yorkshire (excl. N.E. Coast and Sheffield) ..								
Lincolnshire	—	32.2	—	—	0.2	32.2	0.2	32.4
North-East Coast	1.5	66.2	—	0.9	0.4	67.4	1.6	69.0
Scotland	4.1	43.2	—	1.8	0.7	48.0	1.8	49.8
Staffs., Shrops., Worcs. and Warwick	—	17.7	—	0.8	0.6	17.7	1.4	19.1
S. Wales and Monmouthshire	10.7	52.5	5.6 (basic)	0.9	0.1	69.3	0.5	69.8
Sheffield (incl. small quantity in Manchester) ..	9.1	26.9	—	8.6	0.6	43.3	1.9	45.2
North-West Coast	0.2	2.9	5.1 (acid)	—	0.1	8.2	0.1	8.3
Total	27.3	268.0	21.6	15.7	3.4	326.8	9.2	336.0*
October, 1950	25.9	260.5	22.2	15.6	3.5	318.6	9.1	327.7
November, 1949*	25.3	251.4	20.3	14.1	3.5	305.5	9.1	314.6

TABLE IV.—*General Summary of Pig-iron and Steel Production. (Weekly Average in Thousands of Tons.)*

Period.	Iron-ore output	Imported ore consumed.	Coke receipts by blast-furnace owners.	Output of pig-iron and ferro-alloys.	Scrap used in steel-making.	Steel (incl. alloy). Imports.†	Output of ingots and castings	Deliveries of finished steel.	Stocks.‡§
1938	228	89	—	130	118	16	200	—	—
1948	252	172	200	178	174	8	286	214	1,028
1949	258	169	199	183	188	17	299	231	1,275
1950—June	243	170	194	182	199	12	313	246	1,352
July	243	166	191	175	176	13	276	226	1,152
August*	239	175	194	177	181	5	279	199	1,187
September	229	179	198	187	207	8	326	256	1,160
October	266	183	201	194	202	5	328	251	1,097
November* ..	260	179	200	193	206	6	336	260	1,060

* Five weeks. † Weekly average of calendar month. ‡ Stocks at end of years and months shown. § Excl. reinforcement wire, material for drop forgings, bolts, nuts and washers as from July, 1950.

Raw Material Markets

Iron and Steel

Pig-iron production has thus far been maintained, but the fuel position continues to deteriorate and may at any time involve a contraction of output at the blast furnaces. In any event, the changes in production in the Midlands, where two stacks have been transferred from foundry to basic iron, will severely restrict deliveries of high-phosphorus iron at a time when larger, not smaller, supplies were needed. One inference is that pig-iron export licences are likely to be curtailed or banned altogether. In December over 3,300 tons of iron were shipped abroad, compared with less than 10,000 tons in the whole of 1949. Obviously, with British users on short commons, there is no iron to spare for shipment abroad.

Foundry coke supplies are reported to have improved slightly in some districts, but this happier state is by no means general. In fact, some works have been compelled to go on short time—and even to shut down temporarily—because of coke shortage.

Assembly of the necessary tonnages of semi-finished steel, which are required to maintain the re-rolling mills in a state of full activity, is a task which calls for unremitting efforts. There was a shrinkage of half a million tons in imports last year and arrivals are still falling. Such a deficiency is not easily made good. British steelmakers are doing their best to bridge the gap, but the avidity of consumers to acquire defective material bespeaks their dire need for billets, blooms, etc. Special attention is being paid to the needs of the sheet trade, and sheet bars and slabs are coming forward in more or less adequate tonnages.

The slow-down of steel exports has enabled the steelmakers to make some impression—but still only a slight impression—on their arrears of delivery to home consumers. Demand still far exceeds the maximum capacity of the rolling mills, and makers are by no means keen to take on new business at present. Moreover, the now closely impending transfer of authority to the Iron and Steel Corporation adds to the prevailing uncertainty and the general indisposition to mortgage the future. Works already have heavy rolling programmes for the next few months and can well afford to await the turn of events.

Non-ferrous Metals

The Minister of Supply has announced that throughout February the allocation of copper to the trade will be on the basis of 85 per cent. of the average of the first six months of 1950. This compares with 100 per cent. during January, and consumers were under the impression that the tonnage granted for the first month of this year was likely to be available throughout the first quarter. No official explanation has been given as to the need for this further reduction in the flow of copper to industry, and it may be that the authorities have decided to embark upon a policy of stockpiling.

Reference has been made recently in official circles to the need for building up reserves of commodities, and in this matter the base metals certainly will not be forgotten. However, at this juncture it is probably more likely that the Ministry is faced with some further and perhaps unexpected falling away in the supply of copper from the various centres of production. In Northern Rhodesia, it will be remembered, there was, some weeks ago, a cut of 10 per cent. in mine and smelter output on the copper belt. This was said to be due to inadequate fuel supplies and is presumably still in force.

The Order fixing a range of ceiling prices for scrap metals came into operation last Saturday. It is rather too early as yet to say how the plan is working in practice, but comment has already been heard that the permitted charge of 9d. per bag is too low. New bags of the size normally used in the scrap metal trade could certainly not be obtained at that price. As was anticipated, merchants are permitted to charge 2 per cent. commission over and above the maximum price. It is further enacted that the seller's invoice must show how the price charged is calculated. Scrap situated outside the United Kingdom is exempt from the provisions of the Order, so that buyers can presumably pay what they like for imported material, always provided that they are able to arrange the currency.

Tin showed great strength last week and even greater strength this week, new high record prices having been paid.

Official tin quotations were as follow:—

Cash—Thursday, £1,355 to £1,365; Friday, £1,395 to £1,398; Monday, £1,435 to £1,445; Tuesday, £1,435 to £1,440; Wednesday, £1,415 to £1,425.

Three Months—Thursday, £1,325 to £1,335; Friday, £1,360 to £1,365; Monday, £1,400 to £1,410; Tuesday, £1,395 to £1,400; Wednesday, £1,385 to £1,390.

Contracts Open

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

BEDLINGTON, February 14—Cast-iron road gullies, manhole covers, etc., for the Urban District Council. Mr. W. Hall, engineer and surveyor, Council Offices, Bedlington.

BRISBANE, February 21—Gas piping and valves, for the Longreach Shire Council. Room 1073 (reference, CRE (IB) 51537/51).

DEWSBURY, February 19—Steel reinforcements, for the Borough Council. The Borough Engineer, Municipal Buildings, Halifax Road, Dewsbury.

HALIFAX, February 24—Castings, for the Borough Council. Mr. G. Holden, borough engineer, Crossley Street, Halifax.

JARROW, February 28—Cast-iron goods, for the Borough Council. Mr. H. W. T. Perkins, borough engineer and surveyor, Town Hall, Jarrow.

KING'S LYNN, February 17—Gully gratings, manhole covers, etc., for the Borough Council. Mr. H. G. Ridler, 27, Queen Street, King's Lynn.

MACCLESFIELD, February 28—Iron castings, for the Borough Council. Mr. J. H. Dossett, borough engineer, Town Hall, Macclesfield.

MORPETH, February 12—3 in., 4 in., and 6 in. dia. spigot and socket spun-iron Class B water mains, for the Borough Council. Mr. F. K. Perkins, borough surveyor, 36, Bridge Street, Morpeth

NEWARK, February 13—Supply and laying of 990 yds. of 4-in. cast-iron pipes, etc., for the Borough Council. The Borough Surveyor, Municipal Buildings, Balderton Gate, Newark.

NORWICH, February 19—Manhole covers and frames, for the City Council. Mr. H. C. Rowley, city engineer, City Hall, Norwich.

POOLE, February 20—Castings, manhole covers, etc., for the Borough Council. Mr. J. R. Barron, borough engineer and surveyor, Municipal Buildings, Poole.

RUNCORN, February 26—Manhole covers, grids, and frames, for the Urban District Council. Mr. T. J. Lewis, Town Hall, Runcorn.

SOLIHULL, February 17—Manhole and inspection covers, for the Urban District Council. The Engineer and Surveyor, 90, Station Road, Solihull.

SOUTHWELL, February 22—Provision and laying of approx. 100 yds. of 3-in. cast-iron water main, for the Rural District Council. Mr. S. Cooper, surveyor, Council Offices, Westgate, Southwell.

SWANSEA, February 19—Spun-iron pipes and cast-iron specials, for the Town Council. The Borough Water Engineer and Manager, The Guildhall, Swansea.

TYNEMOUTH, February 21—Cast-iron work, for the Borough Council. Mr. D. M. O'Herlihy, borough surveyor, 16, Northumberland Square, North Shields.

WIDNES, February 19—Castings, for the Borough Council. Mr. J. Holt, borough engineer and surveyor, Town Hall, Widnes.

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

(Delivered, unless otherwise stated)

February 7, 1951

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £10 10s. 3d.; Birmingham, £10 5s. 6d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent P, £12 1s. 6d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si)—North Zone, £12 10s.; South Zone, £12 12s. 6d.

Scotch Iron.—No. 3 foundry, £12 0s. 3d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £13 2s. 6d.; South Zone, £13 5s.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £13 12s. 6d.; South Zone, £13 15s.

Cold Blast.—South Staffs, £16 3s. 3d.

Hematite.—Si up to 2½ per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. Coast and N.-W. Coast of England, £12 0s. 6d.; Scotland, £12 7s.; Sheffield, £12 15s. 6d.; Birmingham, £13 2s.; Wales (Welsh iron), £12 0s. 6d.

Spiegeleisen.—20 per cent. Mn, £17 16s.

Basic Pig-iron.—£10 11s. 6d., all districts.

FERRO-ALLOYS

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

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

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

Ferro-molybdenum.—65/75 per cent., carbon-free, 8s. 9d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon free, £120; ditto, copper free, £142.

Ferro-tungsten.—80/85 per cent., 32s. 3d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 34s. 3d. per lb. of W.

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

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

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

Ferro-manganese (blast-furnace).—78 per cent., £31 13s. 1d.

Metallic Manganese.—96/98 per cent., carbon-free, £186 per ton.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £16 16s. 6d.; tested, up to 0.25 per cent. C (100-ton lots), £17 1s. 6d.; hard (0.42 to 0.60 per cent. C), £18 16s. 6d.; silico-manganese, £23 19s.; free-cutting, £20 1s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £22 4s.; case-hardening, £23 1s. 6d.; silico-manganese, £26 6s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £19 16s. 6d.; basic, hard, over 0.41 up to 0.60 per cent. C, £21 1s. 6d.; acid, up to 0.25 per cent. C, £23 1s. 6d.

Sheet and Tinplate Bars.—£16 16s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £20 14s. 6d.; boiler plates (N.-E. Coast), £22 2s.; chequer plates (N.-E. Coast), £22 19s. 6d.; heavy joists, sections, and bars (angle basis), N.-E. Coast, £19 13s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested, £22 6s.; flats, 5 in. wide and under, £22 6s.; rails, heavy, f.o.t., £19 2s. 6d.; hoop and strip, £23 1s.; black sheets, 17/20 g., £28 16s.

Alloy Steel Bars.—1-in. dia. and up: Nickel, £37 7s. 3d.; nickel-chrome, £55; nickel-chrome-molybdenum, £61 13s.

Tinplates.—I.C. cokes, 20 × 14, per box, 41s. 9d., f.o.t. makers' works.

NON-FERROUS METALS

Copper.—Electrolytic, £202; high-grade fire-refined, £201 10s.; fire-refined of not less than 99.7 per cent., £201; ditto, 99.2 per cent., £200 10s.; black hot-rolled wire rods, £211 12s. 6d.

Tin.—Cash, £1,415 to £1,425; three months, £1,385 to £1,390; settlement, £1,420.

Zinc.—G.O.B. (foreign) (duty paid), £151; ditto (domestic), £151; "Prime Western," £151; electrolytic, £155; not less than 99.99 per cent., £157.

Lead.—Good soft pig-lead (foreign) (duty paid), £136; ditto (Empire and domestic), £136; "English," £137 10s.

Zinc Sheets, etc.—Sheets, 10g. and thicker, all English destinations, £170 17s. 6d.; rolled zinc (boiler plates), all English destinations, £168 17s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £170.

Other Metals.—Aluminium, ingots, £124; antimony, English, 99 per cent., £325; quicksilver, ex warehouse, £73 10s. to £74; nickel, £406.

Brass.—Solid-drawn tubes, 21¾d. per lb.; rods, drawn, 29¼d.; sheets to 10 w.g., 26⅜d.; wire, 27½d.; rolled metal, 25⅛d.

Copper Tubes, etc.—Solid-drawn tubes, 23¼d. per lb. wire, 226s. 6d. per cwt. basis; 20 s.w.g., 254s. per cwt.

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

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

Phosphor Bronze.—Strip, 35d. per lb.; sheets to 10 w.g., 37⅛d.; wire, 39¼d.; rods, 36¼d.; tubes, 41½d.; chill cast bars: solids, 42d., cored, 43d. (C. CLIFFORD & SON, LIMITED.)

Nickel Silver, etc.—Ingots for raising, 2s. 3¼d. per lb. (7%) to 3s. 2½d. (30%); rolled metal, 3 in. to 9 in. wide × .056, 2s. 9¼d. (7%) to 3s. 8½d. (30%); to 12 in. wide × .056, 2s. 9¼d. to 3s. 8¾d.; to 25 in. wide × .056, 2s. 11½d. to 3s. 10¾d. Spoon and fork metal, unsheared, 2s. 6¼d. to 3s. 5½d. Wire, 10g., in coils, 3s. 3d. (10%) to 4s. 2¼d. (30%). Special quality turning rod, 10%, 3s. 2d.; 15%, 3s. 6¾d.; 18%, 3s. 11d. All prices are net.

Forthcoming Events

FEBRUARY 12

Royal Society of Arts

Meeting at John Adam Street, Adelphi, Strand, London, W.C.2, at 6 p.m. Series, "Training for Industry and the Professions"; "Training in Industry," by Dr. A. G. Beverstock.

Institute of Metals

Scottish Section:—Meeting at 39, Elmbank Crescent, Glasgow, C.2, at 6.30 p.m. Paper, "Investment Precision Casting," by A. Dunlop.

Institution of Production Engineers

Derby Sub-section:—Meeting at the School of Art, Green Lane, at 7 p.m. Paper, "Generation of Fine Finishes by Machining Techniques," by P. Spear.

Institution of Production Engineers

Halifax Section:—Meeting at Whiteley's Café, Westgate, Huddersfield, at 7.15 p.m. Paper, "The Economics of Foundry Mechanisation," by J. Blakiston.

FEBRUARY 13

Institute of British Foundrymen

Slough Section:—"The History and Development of Aluminium/Silicon Alloys," by Dr. E. Scheuer, 7.30 p.m., in the Lecture Theatre, High Duty Alloys, Limited, Trading Estate, Slough.

Institution of Works Managers.

Preston Group:—"Good Housekeeping," by Miss N. L. Forster (H.M. District Inspector of Factories), 7 p.m., at Starkie House, Preston.

Sheffield Metallurgical Association

Meeting at the Grand Hotel, at 7 p.m. Paper, "What Are Refractories?" by Dr. A. H. B. Cross.

Institute of Marine Engineers

Meeting at 85, Minories, London, E.C.3, at 5.30 p.m. Paper, "Corrosion-resistant Materials," by L. W. Johnson and E. J. Bradbury.

Institution of Production Engineers

Yorkshire Section:—Meeting at Hotel Metropole, Leeds, at 7 p.m. Paper, "Industrial Radiography," by Dr. L. Mullins.

Institution of Production Engineers

Birmingham Graduate Section:—Meeting at the James Watt Memorial Institute, Great Charles Street, at 7 p.m. Paper, "Application of Carbides."

FEBRUARY 14

Institute of British Foundrymen

Birmingham Students Section:—Visit to the Laboratories of the Mond Nickel Company, Limited, at Wiggin Street, Birmingham, 16, at 2.30 p.m.

Incorporated Plant Engineers

Meeting at the Welbeck Hotel, Nottingham, at 7 p.m. Paper, "Geology in the Service of Man," by Dr. W. Davies.

The Newcomen Society

Paper, "Early Refining of Pig-iron," by Dr. H. R. Schubert.

Manchester Metallurgical Society

Meeting at the Engineers' Club, Albert Square, at 6.30 p.m. Paper, "Instrumentation of Steelmaking Furnace—Some of the Problems," by R. Toye.

Royal Society of Arts

Meeting at John Adam Street, Adelphi, Strand, London, W.C.2, at 2.30 p.m. Paper, "1851-1951: A Century of British Science," by Dr. D. McKie.

FEBRUARY 16

Midland Industrial Designers' Association

"The Festival of Britain." Discussion initiated by J. Holland, 7.15 p.m., at the Imperial Hotel, Temple Street, Birmingham.

FEBRUARY 17

Institute of British Foundrymen

Wales and Monmouth Branch:—Annual Dinner and Visit of National President and Secretary. Details from the Secretary.

CLASSIFIED ADVERTISEMENTS

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

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

SITUATIONS WANTED

HEAD FOREMAN requires position as Working Assistant or Head Foreman in N.E. 28 years' experience, 4 years assistant foreman, 5 years head foreman, inclusive. Experienced in machine and plate moulding, railway chairs, etc.—Box 526, FOUNDRY TRADE JOURNAL.

COMPETENT MANAGER (35), 12 years' executive, desires permanent and progressive position. Intimate knowledge iron/non-ferrous, floor, mechanised production, and plant layout. I.B.F. Diploma.—Box 590, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

FOUNDRY METALLURGIST required. Control of Sand and Cupolas and Electric Furnace on Grey and Alloy Iron. Required to supervise laboratory.—State full particulars, JOHN WILLIAMS & SONS (CARDIFF), LTD., East Moors Road, Cardiff.

MOULDERS.—Iron Foundry requires skilled jobbing Moulders. Piecework. Good wages can be earned by first-class workers.—H. SAMPSON & SONS, LTD., Bedminster, Bristol, 3.

SENIOR METALLURGICAL CHEMIST.

A LARGE Birmingham Company requires the services of a Senior Metallurgical Chemist, preferably of Degree standard, able to take charge of a cast iron foundry control laboratory; competent to deal on his own initiative with the many and varied metallurgical (ferrous and non-ferrous) problems which arise from day to day in the factory.

The position, which carries a generous salary for a suitable man, is permanent and pensionable.

Apply, giving full details of age, experience and salary required, to Box 512, FOUNDRY TRADE JOURNAL.

GOVERNMENT OF IRAQ.

FOUNDRY SHOP MANAGER required by the Iraqi Railways for one tour of 3 years in the first instance. Salary Iraqi Donars 90 a month (I.D. 1 = £1). High cost-of-living allowance between I.D. 10 and I.D. 14 a month, according to dependants. Free passages. Liberal leave on full salary. Candidates under 45 must have served an apprenticeship in an up-to-date foundry and be experienced in modern foundry practice covering ferrous and non-ferrous metals. They must be capable of operating cupolan and tilting furnaces, have some knowledge of operating metallurgy, and be able to control and train staff.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the CROWN AGENTS, 4, Millbank, London, S.W.1, quoting M.25167.B. on both letter and envelope. The Crown Agents cannot undertake to acknowledge all applications, and will communicate only with applicants selected for further consideration.

SITUATIONS VACANT—*Contd.*

FOUNDRY FOREMAN required for Aluminium Sand Castings. Must be able to control labour and do the necessary booking. Core Blowing experience an asset. This is a staff position, and permanency is insured for the right man. Good wages and canteen available.—Apply A. R. FORD, VOWLES ALUMINIUM FOUNDRY CO., LTD., Bank Street, West Bromwich.

MOULDERS.—Vacancies occur for a number of good piecework plate moulders. Excellent canteen, baths and welfare facilities.—Apply to WORKS MANAGER, Smith & Wellstood, Ltd., Bonnybridge, Stirlingshire, Scotland.

REPRESENTATIVE REQUIRED.

SCOTTISH Foundry, specialising in Bronze, Nickel Alloy and Aluminium Castings of the highest quality, rough or machined, seeks Representatives in England, able to obtain work on a commission basis.—Box 570, FOUNDRY TRADE JOURNAL.

FOREMAN for small Coreshop in Mechanised Foundry using bench type coreblowers. After satisfactory preliminary service assistance can be rendered with housing accommodation.—RICHARDS (LEICESTER), LTD., Phœnix Works, Leicester.

FOREMAN wanted for Non-ferrous Foundry in South Lancs. Capable of supervising melting and maintaining production at a high level. Must be able to fix piece-work prices and be keen and ambitious. It is essential that applicant shall have held a similar position previously.—Apply, stating experience and wages required, Box 574, FOUNDRY TRADE JOURNAL.

FOUNDRY SUPERINTENDENT, with progressive ideas, required for Midlands grey iron foundry producing light castings for vitreous enamelling and medium castings pressure tested. Must be experienced and qualified to control plate, loose moulding and mechanised sections. This is an important and progressive appointment, and a good salary will be paid. Please send full details of experience and qualifications.—Box No. 706, DORLAND ADVERTISING, LTD., 18/20, Regent Street, W.1.

FOR further introduction of "BRIMULTA" FLUXES, we look for a Traveller well connected in the Foundry trade.—Apply MULTIPLE ACTING FLUX, LTD., 336, Watford Way, London, N.W.4.

ASSISTANT CHEMIST required for Shift Work in Ironworks Laboratory.—Reply, stating qualifications, experience, and full particulars, to MILLOM IRONWORKS, Millom, Cumberland.

MOULDERS, greensand and drysand. First-class experience grey-iron engineering work. Modern foundry. South-East Scotland. Piecework.—Box 582, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*Contd.*

GROUP BUYER required, with experience and good contacts for the purchasing of all materials used in the production of domestic and industrial gas-fired appliances and equipment, which are produced from the raw material to the finished state. The Manufacturing Group comprises four works. The buyer will operate from the group works in the Leamington Spa district.—Box No. 704, DORLAND ADVERTISING, LTD., 18/20, Regent Street, W.1.

CHEMIST required for modern Non-ferrous Laboratory, to be responsible for laboratory and furnace charges on night shift. Similar previous experience desirable. Birmingham district. Good prospects. Salary not less than £450, depending on age and experience.—Full particulars to Foundry Manager, Box 576, FOUNDRY TRADE JOURNAL.

DRAUGHTSMAN for highly mechanised foundry plant, knowledge of electricity, hydraulics, and having practical workshop experience an advantage.—Apply in writing, stating experience and salary required, to ALLIED IRONFOUNDERS, LTD., R.W.S. Department, Ketley, Shropshire.

FOUNDRY FOREMAN.—A first-class, reliable, experienced, and energetic man, not under 38 years of age, required for Foundry producing 40 tons per week. Engineering and high class machine tool castings in green, dry sand and loam. Applicant must produce evidence of successfully filling similar position. Pension scheme; good house available.—Applications treated in confidence, stating full particulars of training, positions held, to Box 588, FOUNDRY TRADE JOURNAL.

SOUTH AFRICAN IRON AND STEEL INDUSTRIAL CORPORATION, LTD.

VACANCY FOR ASSISTANT SUPERINTENDENT, BLAST FURNACES.

APPLICATIONS are invited for the post of Assistant Superintendent, Blast Furnaces, at the Corporation's Works in South Africa.

Preference will be given to applicants with experience of modern steel works plant and practice.

The maximum salary for the post is £1,400 per annum, plus cost-of-living allowance in accordance with the Corporation's scheme, and which at present amounts to £15 15s. per month for married employees and £7 17s. 6d. for single employees. Commencing salary will be determined commensurate with applicant's qualifications and experience.

The successful applicant will be required to satisfy the Corporation's Medical Officer as to the state of his health, and the appointment will be subject to the Corporation's usual conditions of service.

Apply immediately in writing, quoting "I/285." to London Representative, SOUTH AFRICAN IRON & STEEL INDUSTRIAL CORPORATION, LTD., 535/546, The Adelphi, London, W.C.2.

SITUATIONS VACANT—*Contd.*

FULLY experienced die design and production ENGINEER for gravity die casting of aluminium or magnesium. Age between 30 and 40, and willing to move to the United States. £1,800 per year and up, and travel expenses to the right man. Reply immediately, giving full details of experience and positions held, including personal information.—Reply Box 592, FOUNDRY TRADE JOURNAL.

WORK WANTED

WORK wanted for deep moulding boxes 44 in. long by 30 in. wide by 18 in. top by 18 in. depth. Machine moulding. Large pipe fittings or other cylindrical horizontal work. Low phos. iron. Location Clyde area.—Box 532, FOUNDRY TRADE JOURNAL.

FINANCIAL

ENGINEERING INDUSTRY.—Financial group have substantial funds available for the purchase of shares in Private Companies with good profit earning record, or would provide working or development capital on mutually agreeable terms.—Write "Capital," Box 564, FOUNDRY TRADE JOURNAL.

MACHINERY WANTED

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B.M.M., Type AT4, Pneumatic Jolt Squeeze turnover, normal w.p. 80 lbs., squeezing pressure 7,000 lbs. Jolt load 300 lbs. Pattern draw squeezing stroke 9 in. Pattern table 30 in. by 12 in. (new price about £800). Price £300.

B.M.M., Type TO2, Hand Squeeze Turnover, practically UNUSED. Table approx. 24 in. by 18 in. £75.

Hand Squeeze pin lift. Table 1 ft. 10 in. by 2 ft. 2½ in. Lift pin spacing 1 ft. 4 in. by 1 ft. 4 in. Pressure plate 1 ft. 6½ in. dia. £55.

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Coleman "Prosama" Sand Disintegrator and Aerating Machine. Fitted 7½ h.p. Motor 3/50/400 volts, 1,450 r.p.m., with starter. £75.

Sand Dryer, by Foundry Eng. Co. Coke-fired stationary type, approx. 3 ft. 4 in. by 2 ft. 8 in. Fitted NEW firing door. £20.

Coggan "Rocket" Core Blower. 15 lbs. capacity. £120.

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Ditto. Ditto. Ditto. £120.

Ditto. Ditto. £95.

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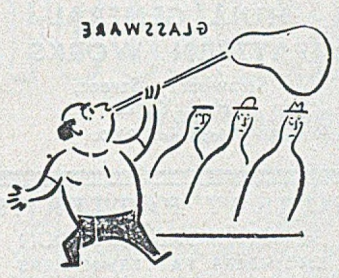

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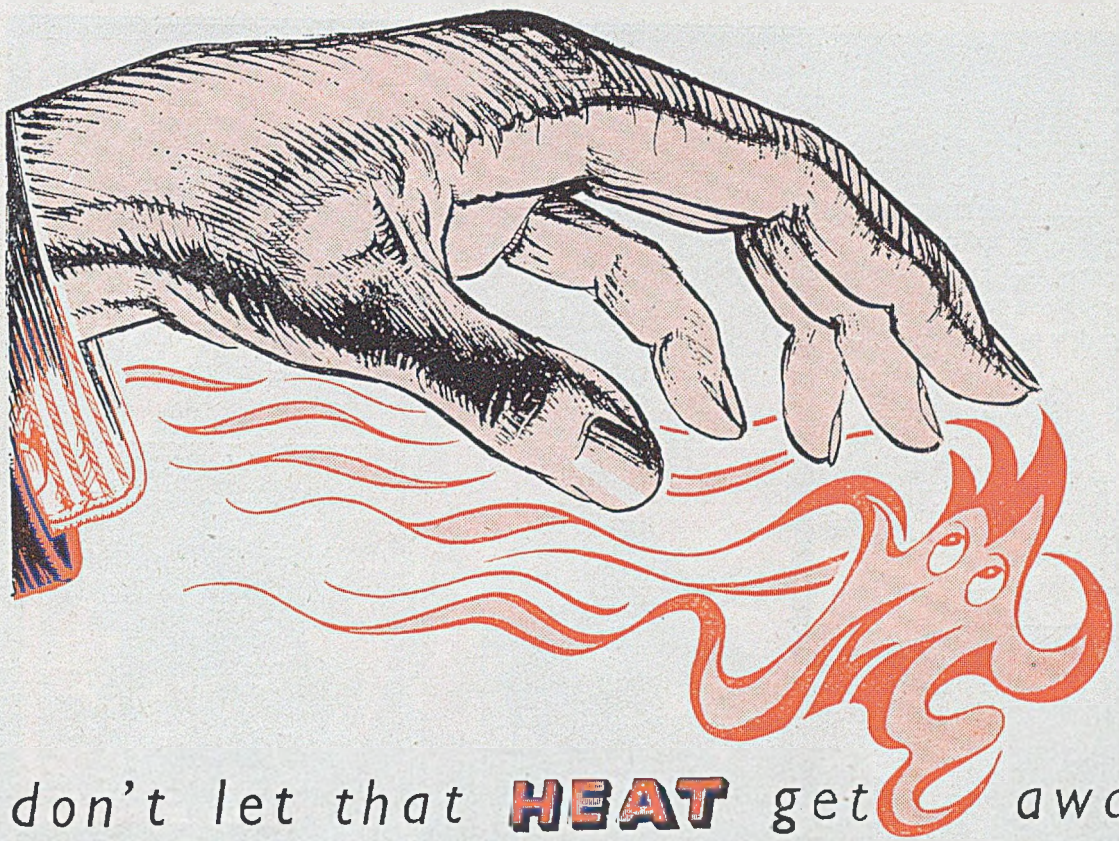

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