

**WORKS DIARY**

June—July 1961

**STAFF**

P. J. Ledger succeeded W. R. Ansell as Maintenance Overseer. Mr Ansell was appointed Transport Officer.  
 B. V. Varney transferred back to the reading office and T. R. Goodall transferred from the casters to the machine room. S. E. J. Sayer joined the DDS staff on the presses, and R. H. Taylor in the passing-on shop.  
 Ave Mrs V. E. Withers (IBM) Vale Mrs K. Stacey (IBM)  
 R. B. Collyer (machines) R. K. Clutton (composing)  
 Mrs O. Debusse (bindery) E. Stoner (gardener)  
 Miss R. Wye (bindery) R. M. Stables (reading)  
 Miss B. M. C. Holland and Mrs J. E. M. Stewart worked for two weeks in the bindery, the former as part of a training course in Social Studies.

**PLANT**

A prototype page lifting device; a bench for the Krause; patching boards for Room B; cupboards for the new Production Office and tied page store; and seats outside the warehouse and on the river-side walk were all constructed. A mitring machine was fitted to the furniture trolley in Room A, and two more Krisson make-up galleys and some perspex 'blanking-out' furniture were bought and are in use. A new 3-phase motor and starter were fitted to no 3 9-crown perfecter and a static eliminator bar to no 1.  
 The floor of the tied page store has been fully tiled and two racks have been completed. The old rag store floor has been made up and the store is being used for storing oil. The seat outside the cycle racks was repaired and two large oak trees in the lane were felled. The new Production Office came into use and the IBM and typographer's offices were transferred from Fenwick House to the new London Office.

**GENERAL**

Mr Clapp attended a three-week course on the IBM 3000 at IBM House, and Mr Johnson a course on the Cost of Labour Turnover at the B.I.M. Mr Buckingham visited Hely's of Dublin. An apprentice selection session was held on July 6, and an Apprentice Forum on July 13.

**THE PRODUCTION COMMITTEE**

Eighteenth meeting—Wednesday 12 July

**MINUTES REDUCED TO SECONDS**—Among the points discussed at this meeting were: the need for a list of where the type cases are kept, for accent cases to be filled completely, and for space boxes to be kept filled up; switching on metal pots for the early shift; inadequacy of the air conditioning units in the caster room; why the Condor was kept standing before the YM P's visit; and some implications of the impending wage and consequent price increase.

**AN AGREEMENT COMMENTARY**

**IBM AND LITHO**—Some weeks ago one of the editors of the BRITISH PRINTER visited the Works and our London IBM office to inspect the system which we are using for setting maths by IBM typewriter. His article on this system has been printed in the July B.P., an issue specially devoted to progress in offset litho and containing for the first time 16 linaset and offset printed editorial pages. The Editorial introduces articles about Brown, Knight & Truscot Limited, Charles Byatt Limited and the Westman Press—all letterpress firms now making outstanding progress in offset litho. Of the first two it comments: 'Both these firms were formerly predominantly letterpress houses which gradually achieved some sort of parity between letterpress and offset production, on the strength of which their managements now see their future growth largely committed to offset,' and refers to the latter as 'one of the most remarkable printing plants now operating in this country'. The Editorial continues: 'Within a more limited field the story of Unwins' ingenious simplification of the exacting problems of mathematical work by an IBM typewriter and small-offset demonstrates another pattern of our times. As with colour work, complex composition needs to meet expanding market requirements for lower costs and greater speeds in exchange for acceptable standards which may not necessarily coincide with the industry's traditional yardsticks.'

The text of the article is reprinted, by kind permission of the Editor, in this issue of the Bulletin. The comments made in this article are complimentary to the Firm, but also germane to broader issues than, simply, setting maths on IBM typewriters. It is our intention to develop what are now often called 'near-print' methods to make mathematical and other setting even more suited to the economy requirements of some customers, while maintaining as high as possible a quality of setting and reading. Although typographic standards must obviously suffer, we feel that it is better to bend with the wind and give the customer what he wants rather than try to force on him what we think he should have. The development of small offset outside the printing industry—and, nearer home, the transfer of 'Science Abstracts' and 'Ref. Cat.' from letterpress to IBM typewriters—illustrates clearly how the determined customer will have his way rather than the printer's.

This does not mean, however, that there is any likelihood of a reduction in the mathematical work which we do at present by letterpress. Indeed, all our development of litho and other non-letterpress processes will continue for many years to be directed towards complementing our letterpress rather than superseding it. Our letterpress craftsmen form the backbone of the business and will therefore continue to have first priority in our sales efforts for as long as we can find and satisfy customers who want their work printed in this way.

However, our letterpress equipment is depreciating year by year and our older skilled men have been retiring at an alarming rate—so our letterpress craft capacity has been, and still is, reducing while the business itself is expanding. At the same time, many customers are becoming more and more interested in the potentialities of litho, and this is another influence which will affect us increasingly. It is towards filling this ever-widening gap between our letterpress capacity and our total potential that our development programme is directed. Both IBM and litho are important parts of this programme because

The Gresham Press

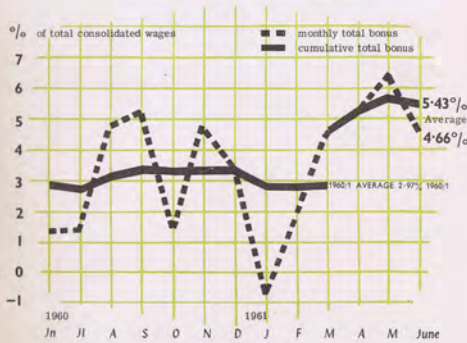
1961 July Bulletin

Volume 2 Number 7

**THE SHARE OF PRODUCTION PLAN**

Results for June 1961

Year 2 Month 3 — 22 working days 5 pay days



The month's figures		The Reserve account	
TOTAL BONUS	£ 546	Balance at 31 May	£ 292
Payout percentage	3.48%	Credit for June	£ 138
Cash payment	£ 408	Balance at 30 June	£ 430

the print will effectively means of combat, grisei g'p'ces. On the old out, 'we say... which sums up well our own attitude:

**T**HE business of the printing industry is to reproduce and multiply words and pictures by whatever means are best suited to make profits and satisfy customers. The basic printing process for the past five hundred years has been letterpress: every order received by a printer could be assumed to be a letterpress job in the absence of any specific reason to the contrary. Today, this assumption is rapidly retreating before the inexorable pressure of offset-litho progress. Litho has taken a century and a half to achieve equality of status with letterpress; now the gloves are off.

Some time during the late 1950s the printing industry passed a momentous milestone without any public realisation of its significance. During those years occurred the very last moment in history when it was still possible for progressive printers to accept or to reject the offset-litho process on an all-or-nothing-at-all basis. In the mid-fifties all the old familiar pros and cons were 'valid' currency: letterpress diehards and offset zealots could still cut and thrust with all the platitudes which used to add up to a mutual

'you'll never convince me, so we might as well agree to differ'. The arguments may still continue in remote corners of antiquated machine rooms, but with about as much relevance to contemporary conditions as a debate on 'Has the horseless carriage come to stay?' The plain fact which has established itself during the past few years is that litho is no longer a 'specialty' process. It is now fully integrated with the economics and techniques of the industry at every level, and in a position to challenge letterpress at most of them.

The challenge is one which can no longer be parried on a basis of 'anything they can do we can do better'. That letterpress possesses the resilience and merits needed for survival is unquestioned, but we must face up to the fact that for many classes of work litho now offers advantages with which letterpress can no longer compete. There is scope and opportunity for litho today in every general printing business of every size, and there can be no doubt that the average and typical business of the foreseeable future will be a dual-process house. +

**IBM TYPING** was established in the Firm in September 1959, when we started a small office in London under Mrs June Reel (shown in the B.P. photograph), and we now have two IBM typists in a department of our new London Office in High Holborn. They are members of the auxiliary branch of the London Typographical Society, the only craft union which has so far accepted the introduction of women typists for this class of work. It has been our wish over the last two years to establish an IBM typing department at Woking also, and after much discussion we have finally been able to reach an agreement with the T.A. on this matter, the text of which is printed in this Bulletin following the B.P. article. We are accordingly now looking for suitable boys to apprentice, and it is our hope that this development will coincide favourably with another: the introduction of the Cartoprint system. This system has already been described at open meetings and to the apprentices and Management staff, some of whom have also seen a colour film about it. Negotiations are proceeding at the moment with the Danish company who market it, and if these are successful we shall publish a fully illustrated description of the process in a future Bulletin.

**SHOP TALK**—The bonus dropped by £110 in June after rising for the previous four months. The average for the first three months of the second year of the Plan is therefore 5.43%. The coming holidays and the wage rise in September are both potential threats to maintaining, let alone increasing, this figure unless there is extra productivity to combat them.

HERI

ADVERTISING DOCUMENT

**NATIONAL HEALTH INSURANCE**—An article in this Bulletin describes what benefits are provided under the National Health Service and how to obtain them. Incidentally, if ever you are in doubt about anything to do with National Insurance you should get in touch with your local office. There is a useful booklet called 'Everybody's Guide to National Insurance', obtainable from the local office (price 6d), which sets out in detail all the benefits.

**OPEN MEETINGS**—This Bulletin contains two items originally intended for the June issue: an article covering some of the points raised at the open meetings in May and a copy of the 'flame-gram' diagram which was used then. This diagram shows the new processes which we are hoping to introduce in the future and how they fit in with those we already have. It may prove useful as a reference when new equipment is bought from time to time, and it certainly highlights two very important things: the key position which the camera will occupy in new developments, and the great versatility of film, as compared with lead.

### LOOKING AHEAD

**HOURS, WAGES AND LABOUR SUPPLY AGREEMENT**—Formal acceptance of the terms of settlement has now been given by all the ten unions and the Councils of the B.F.M.P. and the Newspaper Society, between whom negotiations were concluded in May. The agreements are therefore completed and are dated 30 June 1961. The text of the main agreement is as follows:

#### 1. REDUCTION OF STANDARD WEEKLY HOURS

(a) The standard working week for day workers shall, as from the first full pay week in September, 1961, be 41 hours; where 41 hours or less are at present being worked there shall be no reduction. The hours of double day and night shifts shall be reduced only by such amount as may be necessary to provide a shift of 41 hours per week (or an average of 41 hours for a double day shift).

As from the first full pay week in September, 1962, the standard working week for day workers shall be further reduced to 40 hours. In this case there shall be no reduction when 40 hours or less are already being worked and the hours of double day and night shifts shall be reduced only by such amount as may be necessary to provide a shift of 40 hours per week.

(b) The maximum number of hours of overtime normally permitted under existing agreements shall be increased by one hour per week or its equivalent in September, 1961, and by a further similar amount in September, 1962.

(c) The decision on rearrangement of hours of work in each house shall be made by the management after consultation with the representatives of the employees concerned. Existing practices as regards the day preceding the publication of newspapers shall not be prejudiced.

(d) There shall not normally be any alteration in the piece rates at present in operation. Alterations, if any, shall be a matter of negotiation between the parties concerned.

#### 2. BASIC WAGE RATES

The present basic minimum grade rate in each agreement shall be increased at the first full pay week in September, 1961, by an amount equivalent to 5% per cent (rounded to the nearest threepence) of the basic rates operating prior to the agreement dated 1st September, 1959.

The present agreed extra rates, e.g., for readers, keyboard operators, machines, attachments and processes shall continue to be added to the new minimum grade rates. Apprentices and learners shall receive the appropriate percentage of the new minimum grade rates. In the case of women workers the increase in the minimum basic rate will be equal to the increase in the minimum basic rate of the lowest rated male worker in the same area.

The actual increases resulting from the application of this clause are set out in Appendix 1 to this Agreement.

#### 3. APPRENTICE RECRUITMENT

Recruitment additional to the agreed apprentice quotas, upgradings and other normal arrangements for recruitment shall be effected in accordance with the conditions set out in Appendix 2 to 12 of this Agreement.

Appendix 1 lists the increases in basic rates for all grades in all parts of the country. The figures which apply to us are:

Craftsmen	11/3	NUPB & PW Class 4	9/3
NUPB & PW Class 3	9/9	and qualified women	

**Hours**—Following discussions at the Production Committee, it has been agreed that the reduction of the working week from 42 to 41 hours will be arranged by moving the starting time forward to 7.45 a.m. each day, as follows:

	Present (42 hours)	September (41 hours)
Monday	7.45—5.00	7.45—5.00
Tuesday—Thursday	7.30—5.00	7.45—5.00
Friday	7.30—5.00	7.45—4.45

It has also been agreed that the reduction from 41 to 40 hours due in September 1962 will be met by bringing the finishing time back to 4.45 p.m. each day.

**Overtime**—Present overtime hours during the week will not be affected, but Saturday overtime, when required, will be worked from 7.45 to 11.45 a.m. (i.e. finishing 15 minutes later than at present).

**Tea breaks**—It has been agreed to discontinue the afternoon tea break from Monday 4 September. No tea will be served from the canteen in the afternoons, but additional vending machines are to be installed. The morning break (on day work) will be discontinued in September 1962.

**Shift work**—Present hours and breaks for all men on double day and night shift work will remain unchanged. In September 1961 night shift hours will be reduced from 41 to 40, and the day shift break will be reduced from 20 to 15 minutes. The other apprentices cover apprentice recruitment and are too detailed to reproduce here. The main points were given in the June Bulletin.

The extra recruitment of apprentices has already come into operation, but all the other provisions take effect on Monday 4 September. The following notes cover details affecting hours, and there will be a special issue of the Bulletin next month containing details of all the wage changes which will affect our staff.

**UNSEWN BINDING**—We have now ordered a Sulby unsewn binding machine, which is due to be installed in the bindery in December. The process and the machine will be described in the Bulletin before then.

**WORKS LANE**—Two oak trees have been cut down on the bend in the Works Lane, and the bushes around are now to be cut back to improve visibility. We are also getting quotations for repairing the road surface where the edge is breaking up, leveling the bulges caused by tree roots and making up the area round the car parks. Road work is expensive, however, and this work may have to wait awhile.

**NEXT MONTH'S RESULTS**—Bonus results for July will be announced at the nineteenth meeting of the Production Committee on Tuesday 22 August.

HERE IS YOUR DOCUMENT

### NATIONAL INSURANCE

Sickness, injury and pension benefits and how to claim them

The National Insurance, National Health Service and Industrial Injury combined weekly contributions went up on Monday 3 July. We are taking this opportunity to explain the main benefits obtainable and how to apply for them.

In return for the weekly contributions, the main National Insurance Scheme provides sickness and unemployment benefits; payments at childbirth and death; allowances for guardians of orphans; and pensions on widowhood or retirement from regular work. Payments to this scheme are compulsory for nearly everyone, except married women, between school-leaving and pension ages. A married man's contributions provide also certain benefits for his wife and family.

The Industrial Injuries Scheme provides benefits for those who are disabled or unable to work because of an accident sustained at work or who have contracted certain industrial diseases; and for widows and other dependants of industrial casualties. Contributions to this scheme are compulsory for everyone, including married women. They are included in the combined weekly contributions and are as follows:

	MEN		WOMEN	
	Age 18 or over	Age under 18	Age 18 or over	Age under 18
Paid by employee	0/7	0/4	0/4	0/2
" " employer	0/8	0/4	0/5	0/3
	1/3	0/8	0/9	0/5

#### What benefit you can expect to get

Benefit is not paid for the first three days—called 'waiting days'—of a short period of sickness or for isolated days of sickness. For a long period of sickness, benefit is back-dated to include these first three 'waiting' days, but only after the first fortnight of illness.

#### (a) Sickness benefit

You can receive the following benefits throughout the whole of your illness, no matter how long it is, provided you have paid 156 contributions. If you have paid less than 156, you can only receive benefit for 312 days' illness, after which you may pay 13 more contributions before you become entitled to a further 312 days' benefit.

Weekly benefits for a man or woman under 18	28/6	Additional benefits for dependants		
		one adult dependant	eldest dependent child	each additional dependent child
Weekly benefit for an insured married woman 18 or over	34/-			
Weekly benefit for a man or single woman age 18 or over	50/-	30/-	15/-	7/-

#### (b) Industrial Injury Benefit

The injury benefits set out below are paid for a maximum period of 26 weeks from the date of the accident.

Weekly benefit for a person under 17	63/9	Additional benefits for dependants		
		one adult dependant	eldest dependent child	each additional dependent child
Weekly benefit for a person between 17 and 18	42/6			
Weekly benefit for a person 18 or over	85/-	30/-	15/-	7/-

#### How to claim sickness benefit

You should get a medical certificate from your doctor the first time he sees you, then complete it and send it to the local National Insurance Office. The address of the Working Office is Lampeter House, York Road, and the Guildford Office is at Edgborough, 74 Epson Road. The addresses of other offices can be found at your local post office. You must send notification of illness within three days of being sick. If you are unable to get a certificate, send a letter to the local office telling them of your illness and giving your full name, address, date of birth and national insurance number (if you do not know what your NI number is it is in your own interest to find out immediately. The Accounts Office will be pleased to tell you what it is). You should still send in the medical certificate as soon as possible and in any case within ten days of being sick. Delay in claiming may lead to loss of benefit.

If you think your incapacity is due to an injury sustained at work (or to one of the prescribed industrial diseases) you should fill up the special section of the certificate. You should continue to send in certificates as and when you receive them from your doctor until he considers you are fit to return to work when he will give you a final certificate which you should send in on the last day of your illness.

You should also, incidentally, on the first morning of absence from work, ensure that someone informs your Department Manager of your illness. If you are a member of the Gresham Press Sick Fund you will be required to show your NI certificate to the sick visitor when claiming benefit from the fund after one week and thereafter at regular intervals and on return to work. Fuller details can be found in the Sick Fund booklet.

#### How to claim industrial injury benefit

If you have an accident at work you should make sure that it is entered in the Accident book which is kept by the Welfare Officer, Mr Redgrave. Benefit is claimed in the same way as sickness benefit, but you must make sure that you fill in the section of the medical certificate dealing with Industrial Injury. You should send in your claim as soon as possible, and in any case within 21 days. It is vital to give the exact time of the accident, so before filling in your certificate check the time entered in the Accident book. The NI Office contacts the Firm and if the times given do not tally there may be delay in obtaining benefit.

**General points to remember**

You are not required to pay contributions for the weeks during which you are receiving benefit. You cannot draw sickness benefit as well as injury benefit, but if you are still unable to work after the 26 weeks covered by injury benefit you can get sickness benefit on the usual conditions.

**Qualification for retirement pension**

The minimum age at which you can claim the state pension is 65 for a man and 60 for a woman, but this applies only if you retire from regular work, which usually means giving up paid work altogether. Under certain circumstances, however, you may be allowed to work up to one quarter of your usual hours—about ten hours a week. By staying in regular employment until age 70 for a man, 65 for a woman, you can earn a higher pension; and whether you give up work or not you are entitled to this pension as soon as you are 70 (man) or 65 (woman). To qualify for a retirement pension you must have paid at least 156 contributions in any class, and you must have paid at least 50 contributions for every year in which you have subscribed. If you have paid less than 50 but not less than 13 in any year the amount of pension is reduced proportionally. Less than 13 contributions in any one year means loss of benefit for that year.

**How and when to claim retirement pension**

Just before reaching pension age, whether you intend to retire or not, you should apply to the local NI Office for your right to a pension to be decided. They will usually send you an application form about four months before you reach retirement age, but if you do not get one you should contact them because if your claim and/or your notice of retirement, both of which must be given four months in advance, is late you may lose benefit. If both you and your wife wish to claim a pension you must both give notice of retirement, even if your wife does no work besides her own domestic duties.

**The rates of pension**

	Pension on retiring at 65 (60 for woman)	Pension on retiring at 70 (65 for a woman)
Single Person (incl. widowers) wife not insured	£ 2 10 0	£ 3 11 0
Married couple—wife not insured	£ 4 0 0	£ 5 11 6
Married couple—both insured	husband	£ 2 10 0
	wife	£ 3 11 0
Widow	Husband retired at 65	£ 2 10 0
	Husband worked till 70	£ 3 11 0

A man's pension is increased by 15/6d a week for the eldest dependent child and 7/6d for each other dependent child.

**OPEN MEETINGS**

Survey of developments planned for the coming year

Much water has flowed under the Works since the two open meetings two months ago, and a number of subjects raised at these meetings have since been dealt with in the Bulletin and Committee Minutes. It is impossible to report adequately on the content of over five hours of talk and argument, so the following notes are confined solely to a summary of the plans announced for development in the coming year.

**Office**

Completion of new extensions; installation of IBM 3 000 mechanical composing system in autumn; creation of a planning and copy preparation department.

**Composing Department**

Reorganisation of composing room layout together with big reductions in stores, frames and cases; start on new reading office (including library and copy preparation room), 'platen shop' and new BMR department; purchase of new galley proofing presses, readers' furniture and litho make-up equipment; introduction of IBM typing at Woking and of Cartoprint; preparation for photo-composing in 1962.

**Print Production Department**

Extension of imposition in machine room to cover all formes for machines in Room A; completion of tied page store and reduction in standing formes; introduction of process department to make litho plates; sale of old machines in Rooms A, B, C and D; purchase of forme register table, second Condor, second Empress, Stahl high-speed folder and unsewn binding machine; reorganisation of warehouse—bindery and stock store layouts; transfer of folders to Room B, on shift.

**Building plans**

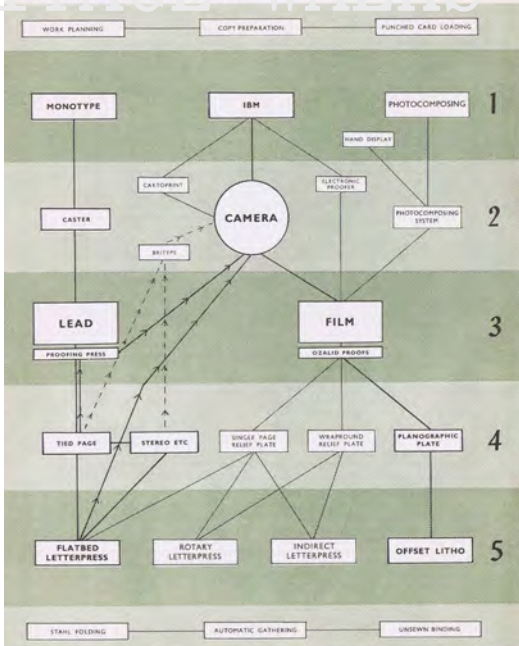
Making permanent south wall of Room A (adding windows); removal of walls between warehouse and Room B; new floors in composing room and keyboards; work on offices, reading and copy preparation offices, process room, tied page store, ink store, drinking water points and hot water facilities; improvements in Works lane, heating installations and ladies lavatories, strip lighting in Room B.

**Other developments**

Introduction of new plan for apprentice training; 'Black spot' campaign to improve standards of cleanliness and provide welfare fund (see S.H.O.P. minutes, point number 113); evening seminars during autumn and winter on various technical subjects; progress of all points raised at Share of Production Plan committee meetings; publication of new House booklet.

It is notoriously difficult to plan detailed developments a long way ahead—plans must remain very flexible in order to take into account constantly changing priorities and new technical achievements. We will inevitably find as the year progresses that some new plans will displace some of those announced, and consequently some of our projects may not get started until next year. It will still be our aim, however, to try and stick to the development programme as closely as we possibly can.

**PRINTING PROCESSES CHART**



The chart shows the various methods of conversion from the keyboard to the two types of product (lead or film) and (4) five different types of printing surface. In the following description the heavy type refers to the hours on the chart.

The top rank shows the three new office procedures which are to be introduced to improve office efficiency in preparing work and programmes for the production departments.

The middle five sections trace the route from (1) three types of keyboard to (2) four types of printing machine, via (3) the various methods of conversion from the keyboard to (4) the two types of product (lead or film) and (5) five different types of printing surface. In the following description the heavy type refers to the hours on the chart.

**1 THE KEYBOARDS**—Three types of keyboarding are envisaged: Monotype, IBM and photocomposing. The first two, of course, we already have; we do not yet know definitely what type of photocomposing system we shall have—all that is certain is that we shall have one. Display setting for photocomposition will probably be done by hand rather than mechanically. IBM produces a single typed sheet, and the other two a punched tape, all of which then go through a process of:

**2 CONVERSION**—The Monotype spool goes through a caster, and the photocomposing tape through one or more pieces of equipment, probably electronic (called on the chart a system for short). The IBM typed sheet will either pass through an 'electronic proofer' (a piece of equipment being specially designed and built for us at the moment) or be photographed direct. Both the photocomposing system and the 'proofer' have their own built-in cameras.

The camera at the centre of this section will also handle Cartoprint and Britype. Cartoprint is a system for composing lists using IBM typewriters and other special equipment; and Britype is a method of converting type direct to film by photographing the face of conventionally made-up letterpress pages or stereotypes—shown by dotted lines with arrows on the chart—which have been sprayed with lamp black and polished to produce a reflecting surface. In addition, the camera will be used for photographing good pulls either of pages from a proofing press or of sheets from a flattened machine (shown by the lines with arrows pointing upwards).

**3 THE PRODUCT** from all these various methods is either LEAD (from Monotype) or FILM (from all the rest). PROOFS are produced from lead on a conventional proofing press, and from film by Qualid (an ammonia-diaz process of which blueprints are one example).

**4 THE PRINTING SURFACE**—Five types of printing surface are shown, three of them in individual page form, the other two overall plates. Lead can be used to produce tied pages or various types of moulded duplicates—stereos, etc; and from film, single-page relief plates can be etched in various metals (usually zinc and magnesium) or plastics.

Overall plates are of two sorts—relief, etched in metal or plastic and known as wrapround; and planographic, that is to say flat-surface plates for offset or direct litho.

**5 THE PRINTING MACHINES**—Flatbed letterpress will take tied pages, stereos or flat-mounted relief plates. Rotary letterpress prints from curved stereos or relief plates, either wrapround or individually mounted (either direct on the cylinder or stuck down on a flexible thin metal 'sleeve' which is then fitted on the machine like a wrapround plate).

Indirect letterpress (also known as 'dry offset') is an unusual system combining letterpress and offset principles, in which a relief plate is used to print offset onto a blanket, thence to the paper. So in direct rotary the printing image is reversed (as in ordinary letterpress), but with indirect letterpress it is right-reading (as in litho). Indirect letterpress will therefore only take wrapround or individually mounted relief plates (like rotary letterpress), but not curved stereos.

Finally, offset litho prints from planographic plates only.

The bottom rank shows three new developments planned in the warehouse—bindery. Stahl machines are high-speed back-to-back folders (double medium in size, to match the Condor). Double instead of quad sheets will mean twice the number of folded sections, and automatic gathering will enable these to be handled more economically. Unsewn binding is a method in which the bolts of folded sections are cut off by rotary knives and the pages, now separated, then glued together by adhesive rolled into the spine of the book.

HERITAGE WALKS DOCUMENT

## THE COST OF LIVING BONUS

Details of the rates from Monday 3 July

The method of calculating the cost-of-living bonus was described in the December Bulletin last year. The bonus is revised twice a year according to the Ministry of Labour's index of retail prices in May and November, and in the last six months the value of the index has risen two points. As a result the following changes came into effect on Monday 3 July:

Class	1 Value per index point	2 Value January- June 1961 (Index: 172)	3 Value July- December 1961 (Index: 174)	4 Value of increase (2 points)
Men over 21	1/-	17/-	19/-	2/-
Women (except learners)	0/9	12/9	14/3	1/6

Apprentices			(headings as above)			
6 years	1	% of basic	1	2	3	4
1st	-	25%	0/3	4/3	4/9	0/6
2nd	1st	30%	0/6	5/-	5/9	0/9
3rd	2nd	40%	0/6	6/9	7/6	0/9
4th	3rd	55%	-	9/3	10/6	1/3
5th	4th	65%	-	11/-	12/3	1/3
6th	5th	75%	0/9	12/9	14/3	1/6

Training period	Girls entering at age					
	15-17		17-18		18 and over	
	New bonns	Increase	New bonns	Increase	New bonns	Increase
1st six months	6/6	0/9	7/-	0/9	7/6	0/9
2nd "	7/3	0/9	7/9	0/9	8/3	0/9
3rd "	7/9	0/9	8/6	1/-	9/-	1/-
4th "	8/6	0/9	9/-	0/9	9/9	1/-
5th "	9/3	1/-	9/9	1/-	9	-
6th "	10/-	1/-	-	-	-	-
On completing training	14/3	1/6	14/3	1/6	14/3	1/6

Rates for boy learners under 21 are not listed because of shortage of space.

## NEW TECHNIQUES TO SOLVE ECONOMIC PROBLEMS IN A SPECIALISED FIELD

# Simplified Approach to Mathematical Printing

IN 1954 a clear warning was addressed to mathematical authors from Oxford: "At this time there is a strong advocacy to displace the printing of mathematics by photographic methods applied to typescript or manuscript. . . . But it is difficult to believe that these processes are ever likely to meet the present demands of mathematicians for the rich and complex symbols that are essential to the subject. It is increasing complexity of mathematical notation which is the main reason that publishers are driven more and more to photographic methods, the prospect for mathematicians is bleak."

The recommendations to mathematical authors contained in this book have done much to minimise rising costs by encouraging authors to consider their expression of complex abstractions within the limitations of what is practicable for the printer. A special issue of *The Monotype Recorder* (Winter 1958) on setting mathematics has played a similarly useful role by presenting a solid foundation of rules for composition.

Highly commendable as these works are, they can only offer the kind of advice that will limit costs. They offer little solace to the printer who is obliged to turn down a potential client who wants to publish an advanced mathematical monograph but who is not prepared to pay the estimated cost of composition. If the printer were to give up his hands in despair and say that it was impossible to do it at a lower price, nobody would consider him any

the less unconcerned for that! But a customer of the printing industry might be fast—and perhaps too fast—over the "photographic methods" continually bandied as a solution. There is a considerable cost in the use of the most-efficient "printer" about them. The printing of mathematics could be set another race in which the printing industry started hot favourite and limped home as an "also-ran".

On the printer's side, the Monotype Corporation has introduced the fine-line system of setting mathematics and in August 1957 announced the casting of the first 700 characters for use with it. This represented a major step towards solving the setting of mathematics on a more mechanical basis than before, the first major advancement, in fact, since the pioneering experiments in mechanical mathematical composition made at the University Press in Oxford in 1930.

Basically the system consists of dividing an expression into letters (uppercase and lowercase) and treating each as two lines. All characters are cast on 6-point bodies, and all except those used as superior or inferior characters have a considerable "top overhang". Second order superior or inferior letters have smaller forms, not high and low respectively, on their bodies. To support overhanging characters, the compositor's prod should shoulder high spots of the correct size within the preceding line. This method of setting formulas should provide complete mathematical composition except for the subsequent addition of 2-point strike rules and large integrals, etc. that cover four lines.

The inherent value of the system is that, while minimising the amount of

time spent on make-up, the high typographical standards and quality of impression that are obtained from metal composition, to which the mathematical reading public in this country is accustomed, can be maintained. Nevertheless, the fine-line system has never achieved the complete acceptance amongst mathematical printing houses that might be expected. The reason is twofold.

Firstly, many printers have evolved their own systems using their own adaptations of Monotype keyboard practice, which, because of their familiarity and the skills developed by the compositors operating them, remain economically competitive amongst printers normally involved in mathematical printing. In other words, it is still possible to treat those mathematical works, which in the opinion of the publisher merit certain high standards of production, at a price he is prepared to pay.

The second, and more telling reason, is that in the field of mathematical composition metal has certain fundamental limitations. There is no quick and easy vehicle to compensate the flexibility of the mathematician's pen to roam over a sheet of white paper and the mechanical discipline of the point system and the printer's "white" filled with leads and spacers.

A fair estimate of the saving made over conventional methods by the fine-line system is said to be 30 per cent. Rising costs of skilled labour and materials may soon nullify the effect of this economy. The printing industry must try all its technical and inventory tricks to discover a more "natural" way of transferring formulae onto print before the

\*The Printing of Mathematics by T. W. Chanda, P. R. Brown, and Charles Bury (Oxford University Press, 1958).

# HERITAGE ARCHIVE DOCUMENT



Simplified Mathematical Printing

cost of composing reaches the dangerous "stage" it is heading for.

In this technological age there is already an increasing demand for a widening sphere of scientific and industrial publishing for mathematical printing which does not justify the present heavy costs. If the means can be discovered of keeping this work within the printing industry proper, the way is towards solving some of the heavier cost problems may be opened.

In 1958, Unwin Brothers Ltd of the Grosvenor Press at Woking were asked by Fredrick Spix of Southampton to provide a quotation for printing a mathematical monograph. The quotation was subsequently rejected, because it was too high. Unwin, however, did not let the

matter rest there and to lose a customer. Instead, they referred it to their Development Engineer, R. E. Smith. What resulted was an ingenious link with Unwin's litho development programme and what could herald a new phase in the printing of mathematics. What also resulted, and this was their evidence of success, was that a very substantial amount was topped off composing costs, in spite of the complexities of the job and the fact that several techniques were being employed.

The means of composition developed by Mr Smith was a special attachment fitted to an ITC Executive typesetter. The result, if judged by traditional standards, was by no means perfect, but the important thing was that it proved to be

a success and what resulted was highly acceptable to Fredrick. The shortcomings of the system did not lie in any difficulty in setting any required formulae, however complex, but in achieving the typographical standards associated with metal composition. While every printer should aim at typographical perfection, it is shortsighted to expect the same standards from something which is intended merely to inform rather than to delight aesthetically when there are strong economic arguments against the cost of doing so. In the sphere of mathematical printing to which the Fredrick monograph belonged the only requirements were that it should be clear and unambiguous and not too costly. Both these demands were adequately fulfilled.

The attachment that Mr Smith invented (for which patents are now pending) and which made mathematical composition on the ITC typesetter

possible consisted of a device fixed above the carriage in which auxiliary type bars for special characters not included on the duclos four-line keyboard could be attached. A special case was constructed to contain all the necessary auxiliary sets needed for the work at hand. The operator typed the text and the characters in the formulae included on the keyboard and, on encountering a special character, selected this from the auxiliary case, fitted it to the bar and struck it.

A number of important practical problems had to be overcome before the system was profitable enough to produce the quick, easy and efficient operation

that was required to produce good camera copy at a reasonable speed. Many of the extra characters were available from iron. As these were easily fixed to type bars, were engraved characters and were made in the correct metal to give the clean line impression required, they presented few problems. Other characters, however, particularly the more specialised mathematical sets, had to be obtained by casting type sets in a very hard alloy (20 parts antimony and 25 parts tin) and soldering them to the bars. There was also an important additional problem, new characters are specially engraved to strike evenly over the curved plates of the typesetter, so to



To type a character not included on the duclos keyboard an auxiliary type bar from the special case (above left) and attach it to the auxiliary setting device above the carriage (above) and it is transferred to a vertical position in front of the other type bars ready to be struck (below)

obtain an even impression from type characters each had to be individually milled so that they too gave the uniform impression that was so necessary for subsequent camera work.

Another problem involved obtaining a movement of the operator to correspond with the suit width of each auxiliary character, as the raw typewriter provision proportional spacing. This was achieved in a simple but ingenious way. The special keybars are lightly held to the attachment by a vertically positioned by the character itself. Pressure is applied to the auxiliary type bar by the action of one of the bars of an ordinary character on the machine. By selecting a character from the keyboard with a suit width corresponding to that of the special character, the carriage is automatically moved to the correct extent. A projection behind the auxiliary character connects with the space between the upper and lowercase positions of the typewriter's keyboard so that the striking action does not damage the characters.

A spring device ensures that the character swings back swiftly after impression. The spring action, which is adjustable, has a secondary function of varying the amount of angle so that a character with a small surface area gives the same impression as one with a larger area.

It is evident that an unlimited range of extra texts can be used and that speed of composition depends largely upon the experience of the operator and the clarity of the copy. Vertical half-spacing is incorporated in the set Executive and all second order superior and inferior can be incorporated on auxiliary type bars, so that even the most complicated formulae can be accurately spaced and arranged without breaking away from the basic system. The only characters that cannot be put in on the typewriter are the large integrals covering four lines of a formula. Spaces are left for these and they are incorporated during make-up. The fine-line system also demands that these are inserted at the make-up stage.

Make-up is done entirely by pasting the typed copy with the illustrations into page form. Fine-line integrals are inserted with another device controlled by Mr Smith. It consists of a piece of rigid transparent plastic in which a hole, corresponding to the body size of the integral character, has been cut. This device is positioned on the make-up and

### Simplified Mathematical Printing

the character inserted and printed so that a slight indentation is left in the paper. This shows whether the character is correctly positioned. The margin is one inch and printed through the aperture again, leaving an impression in quality and weight, comparable to the rest of the typed material.

At this stage any errors can be corrected by simply passing in correctly typed sheets. For this reason, Unwin, in the case of the Fraleigh monograph, submitted draft proofs of the page-up pages. Corrections were heavy, as they usually are with mathematical manuscripts, and the method of proofing pages is a simple way of allowing extensive corrections in some of the copy in one file and no expensive stripprints is necessary.

The strength of the system lies in the fact that both end spaces are neatly dimensioned in other words, the 'width' is obtained for nothing. The margining of both ends and spaces probably consumes more of a skilled operator's time than any other aspect of composing formulae. Unwin pointed

out that savings in this respect are so great that even bigger economies would be possible in the future now that they had gained more experience in what has been, so far, pioneering work. Just over a year after the order was first placed the job was completed and the first copies were dispatched to America in time for a conference. During the numerous months the idea had been conceived, experimental work carried out, practical difficulties overcome, skills developed and the actual job set up and printed. Furthermore composing units were cut by half and what would have appeared impossible to many printers turned out in Unwin's case to be practicable reality.

The new Unwin system introduced space for this project work, in the first place, an excellent, but routine, job. It was done for a vast amount of mathematical work which might have gone either than the conventional printer's way, and Unwin justifiably felt that the process fully justified further exploration in the future. At the same time they drew a deeper and more far-reaching moral. Before the Fraleigh order, their thoughts were already directed towards the future implications of all aspects of litho printing, and more specifically sheeting. The present method, while providing the printing means for a certain class of work, only scratches at the surface of a bigger future. Unwin's objective is to find the means of composing and printing litho mathematical manuscripts with typographic standards as high as possible.

Unwin Brothers have had their own equivalent of the four-line system for many years, and find it very efficient but very costly. These sheets must accept and still regard mathematics as the inevitable corollary of tomorrow's printing might be reminded of a recent precedent. Copperplate script and its use in the one thing that could be done better by traditional means than by any other: yet now, the one thing that can be done better than typesetting in copperplate script. The need is for obvious, or at least, not too obvious, means. Any category of work which has hitherto been regarded as inevitably restricted to one traditional process or method is liable, eventually, to take advantage of new techniques. When it does break out of its time-honoured boundaries there are often new and considerably expanded market opportunities that are awaiting its emancipation. \*

It is then found, with the usual notation for  $a, b, c, \dots, x, y, z$ :

$$(1) \quad \frac{\partial}{\partial x} (a + bx + cx^2) = b + 2cx$$

and

$$(2) \quad \frac{\partial}{\partial x} (a + bx + cx^2) = b + 2cx$$

where

$$a = a, \quad b = b, \quad c = c$$

in which

$$a = a, \quad b = b, \quad c = c$$

In order to calculate the total stresses due to the lagging operation, one proceeds in the same way as seen in the preceding section.

It can be shown that for  $a, b, c, \dots, x, y, z$ :

$$(3) \quad \frac{\partial}{\partial x} (a + bx + cx^2) = b + 2cx$$

with for  $a, b, c, \dots, x, y, z$ :

$$(4) \quad \frac{\partial}{\partial x} (a + bx + cx^2) = b + 2cx$$

Reproduction from "Paper handling of a single size table", the mathematical monograph ordered from the Fraleigh by Unwin Brothers and completed by the Fraleigh by Unwin Brothers.

MATHS PAPER JULY 1961

### IBM TYPING AT WOKING

Labour agreement between Unwin Brothers Limited and the T A

The following is the text of an arrangement agreed between Unwin Brothers Limited and the Typographical Association concerning the introduction of an IBM typing department at The Gresham Press. This was reached after discussions on Tuesday 13 June between T A Officials (Messrs Simmons, Hutchings and Andrews), the Management (Messrs Rolf Unwin, McIntosh and Hughitt) and the Branch and Chapel representatives (Messrs Liddington, Butler and Down); and subsequent further discussions and correspondence between these parties.

- 1 The Firm wishes to introduce IBM typing and the Cartprint system into the Works at Woking, and requires three additional staff for this.
- 2 The T A agrees to the introduction of suitable male labour in addition to the Firm's present craft strength, and in addition to the two members of staff already employed on this work. The T A offers the Firm two bonus apprentices (in addition to the bonus allocation under the 1961 Hours & Wages Agreement) to be taken on for this work in the coming year.
- 3 These boys will serve a normal term of apprenticeship and will be designated as compositors. Their training will be primarily concerned with IBM and make-up work in all its aspects, but they will also receive reading and some formal composing instruction. The Firm will give them schooling suitable to their age and experience and will treat them in every respect like other apprentices. Their schooling will comprise day release classes at commercial and printing schools as appropriate.
- 4 IBM and make-up work undertaken at the Works will be under T A craft supervision, and the section will form part of the Composing Department.
- 5 From October 1961 all composing apprentices will receive training in this class of work, and other T A craftsmen (compositors, readers and keyboard operators) will be given an opportunity to handle such work as and when occasion offers.
- 6 If this class of work should not develop sufficiently to keep one or both of the bonus apprentices occupied primarily on it, then the Firm will forfeit the corresponding number of bonus apprentices from the number to be granted under the 1961 Hours & Wages Agreement. The boy or boys taken on as IBM apprentices would in these circumstances transfer to normal composing apprenticeships.
- 7 In view of the Firm's estimate that it will require three additional staff, and the Union's offer of only two, the situation will be reviewed in a year's time, if not before, to decide if it will be necessary to recruit a third person for this work.
- 8 This is a House agreement which will in no way prejudice or create a precedent for negotiations over labour in other printing houses.

Tuesday 11 July 1961

# HERITAGE DOCUMENT

### RETROSPECT—II

The passing of William Owens recently brought to an end a record of over 100 years of family service with the Firm that is not likely to be equalled. His grandfather was one of the 'Pilgrim Fathers' who migrated to Woking Village after the fire at Chilworth in 1895. His father and uncle were machine minders and ran early Wharfedale and Barr Perfectioners prior to the installation of the Miehle 2-revolution and perfecting machines. Grandfather Owens lived in a little cottage where the waste paper is now baled, and the cycle sheds and garages now occupy his garden—hence the sole remaining plum tree. Drinking water came from the well and pump that stood outside the present power house, and water for all other purposes was taken from the river.

There were two turbines—one small one in the Engineers' shop which continued to rumble until after the last war, and a larger one where the present turbine is. There was also a Crossley gas engine which was supplied from a wet gas plant which stood where the men's toilets now are. The engine exhaust could be heard in Woking town on a favourable wind, and so could the steam hoister which summoned the employees at 7 a.m. in the morning.

Lighting was by early electric carbon filament lamps and a few experimental carbon arcs which were supplied by current from a dynamo in the back store, the lights continually going up and down with the change of load on the turbine. Later a more modern dynamo came in with a larger twin-cylinder Crossley engine. Power was transmitted to the machines by shafts and counter-shafts with numerous endless leather belts which we boys rode up as they allowed down, dropping off before reaching the pulley overhead. The Bindery-Warehouse occupied the recently cleared White Paper area, and the present Reading Office was the women's dining room, the two concrete slabs still there being where the old Tortoise stores stood.

Piece work was the order of the day at 6d a thousand for men (6d for foreign or extra bad copy, which was all manuscript) and 3d for women and apprentices, and of course each man had to do his own cases of letter at his own cost—from any rubbish the Storekeeper wanted to get rid of. Time rates were 25/6d or 31/6d if you were on 'stab' for a 55-hour week. The present Mono Room was a women's piece shop with apprentices and a few 'stab' hands. Foreign bibles were their bread and butter. At the end of this room the first line-composing machines—Typographs—were installed, becoming eventually a battery of 8, the last of which went out about 1925 after it had been decided to install all Monotypes. In the large Composing Room were about 60 piece comps who often did not have more than a few hours' work a week. Readers were installed in individual boxes along the wall and, being the gentlemen of the industry, wore bowler hats and worked shorter hours. Where the Bindery stands today were the stables and a long line of bucket closets. The coachman, Jack Tucker, in top hat, cockade, and high boots took his high-stepping pony and polished trap to meet 'Mr George' at Woking Station every morning, with a huge umbrella on wet days.

The Woking Rifle Club had its firing range where the garden is now, with butts at from 25 to 250 yards, and the Woking Swimming Club had the use of the end portion of the old Long Room. There were steps and diving boards and these stalwarts were real all-the-year-round early morning swimmers.

MR REDDALE

with a hiker with his pony (about 1910)



The old Crossley twin-cylinder engine in the engineers' shop (Mr T. Jordan senior, then Maintenance Overseer, on the left)



The 1910 Anniversary swimming race, bearded Grandfather Owens on the platform



Grandfather Owens' cottage is in the middle of this photo of the front of the Works before it was rebuilt in 1896. The right hand figure is Mr George Soudy Unwin

