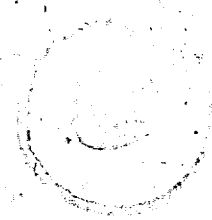


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PRINTECH 1955

V. II No 8, 9



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OF THE INDIAN FEDERATION OF PRINTING TECHNOLOGISTS - MADRAS

Vol. II

MARCH 1955

No. 3

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Articles of technical interest
on printing and Allied Trades
are invited for publication
from Master Printers, Techno-
logists and others connected
with the industry.

All correspondence regarding
matter for publication, sub-
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Hon. Secretary, 61, Armenian
St., Madras 1.

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PRINTECH is sent free to all our members, who are technically trained printers, spread out all over India in several printing establishments of varying sizes. It is also being read by several other Master Printers who subscribe to the journal.

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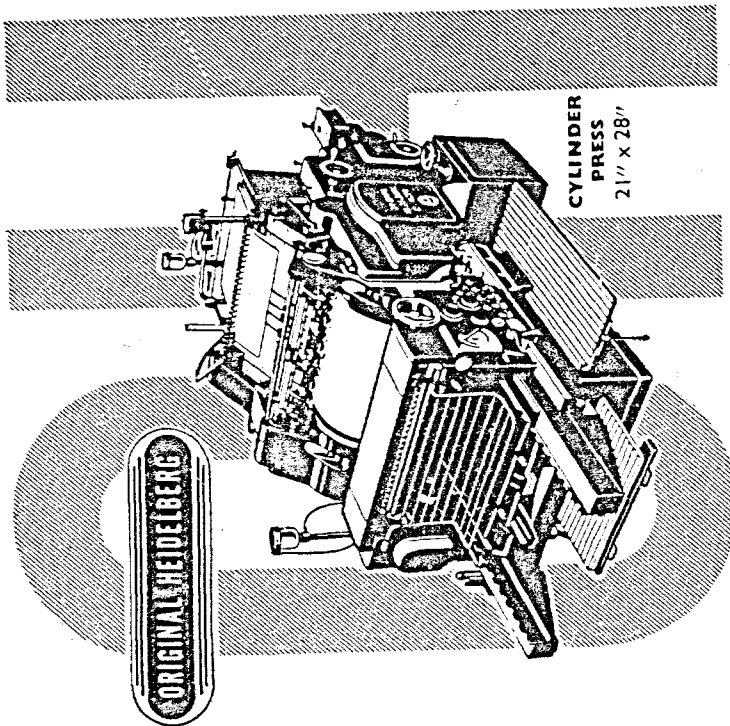
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CHOICE SPECIMENS OF PRINT SEALED FOR POSTERITY AT PATRA

THE first phase in the life of the choice specimens of print selected for the 1953 Annual Print Collection, arranged by the British Federation of Master Printers, ended at the Leatherhead laboratories of the Printing, Packaging and Allied Trades Research Association on January 4, reports *Printing World*. Two large, air-tight, tinplate containers—one housing between 40 and 50 examples of the best printing of the year 1953, the other a duplicate set—were hermetically sealed by F. A. Paine, PATRA's packaging inquiry officer. The Federation President, Geoffrey C. Griffith, and the chairman of its public relations committee, John Cheney, together with PATRA's director of research, Dr. G. L. Riddell, were present at the ceremony.

The containers will be kept in one of the cellars beneath the Federation's headquarters in Bedford Row, London. One will be opened in a few years' time and its contents displayed; the duplicate set will be retained for posterity, and will be examined from time to time to check on the packaging.

The idea behind the print collection—the first of its kind in Britain—is to provide a chronologically-arranged series of examples of the best the printing industry has produced, chosen annually, in order to reflect the progress of technique, taste and fashion through the years.

It was obvious importance that the examples should remain in perfect condition. Thus, at the inception of the scheme, the Federation called in PATRA for

advice on how best the specimens should be packed and stored.

Various precautions have been taken at PATRA to ensure that the prints do not deteriorate because of changes in the atmosphere, the presence of acid in the air, or the harmful effects of daylight. The specimens were first of all kept 'naked' at set conditions of temperature and humidity (room temperature and 55 per cent relative humidity) in a storage chamber for a fortnight. At the end of this time they were sealed in plastic envelopes made of polythylene under the same atmospheric conditions, removed from the special room and placed in the tin containers; these, containing a chemical to absorb sulphur dioxide in the air, were finally sealed off with moisture-proof self-adhesive tape.

The bags holding both sets of specimens were heat-sealed. It is considered that PATRA's packaging technique will ensure that the prints will stay in mint condition for a long period.

The specimens include booklets, catalogues, calendars, folders, leaflets, showcards and posters, menus and letterheads. Apart from these examples of the 'best jobbing work', there are a number of specimens having a historical significance, most of which are concerned with the Coronation of H. M. Queen Elizabeth II. The judging was conducted by a panel of Master Printers.

A pamphlet giving instructions on how to submit material printed in 1954 is being issued by the British Federation of Master Printers.

Transfers Images to Both Sides of Plate

By courtesy of *Electrotypers' & Stereotypers' Journal*

When Germany fell to the Allies in May, 1945, many scientists and technicians were interviewed regarding their work during the war and an assessment was made of German scientific and industrial advances which had taken place during the war years.

One person questioned was Herr Groyen, of Kind Jr., process engravers of Bielefeld, Zimmerstrasse, who claimed to have invented a new printing process which was used during the war by the German Army for the rapid distribution of reproductions of air survey photographs, maps and documents.

His invention claimed the following features:

- (a) Speed from receipt of picture to start of printing 1½ hours to 2 hours.
- (b) No makeready.
- (c) Usable on letterpress, litho and aniline printing machines.
- (d) May be printed with good results on stock of newsprint order.
- (e) Only very light impression required.

The principle of the process was of a double image, images transferred to both sides of a thin, flexible printing plate, the first giving a halftone relief effect upon the printing surface and the second image acting as an interlay. The process is comparable to 'dry litho.'

Different Exposure

For both images a form of carbon tissue is used; in both instances the tissue is the same, but it is exposed in a different manner. The tissue was stated to be a composition of gelatine and artificial resin and contains no pigment.

The image is photographed down on to the tissue for printing side from a normal high-light halftone screen negative, and laid down on the plate in the manner of the photogravure process. For the interlay side, sharpness of dot is undesirable. The conditions of printing are therefore adjusted to diffuse the image of dot pattern, e.g., printed down with the glass side to the tissue, this also giving the necessary reversal.

Exposure time ratio for front to back is in the region of 10:6 minutes, using open carbon arc. Register marks are placed on the negative. When the first exposed tissue is laid down on the plate the register marks are visible and are transferred to the back by pressing with a sharp point which raises a mark on the reverse side. The second image is registered to these marks. Development of both sides is done simultaneously, as does the drying, which is done in a cupboard with air agitation.

The plate appears to be a piece of litho zinc bearing on one surface a relief image in a hard black substance and on the reverse side a hard yellowish relief image, which is translucent. A light scrape showed that the pigment on the printing side was entirely on the surface and Herr Groyen stated it was the result of the longer exposure of that image. There was a continuous film of tissue all over the

plate, so that the height of the relief was somewhat less than the total thickness of the tissue film.

Material for the plate may be of sheet metal, 'Astralon' or paper. No grain is required. Total thickness of the plate with the two films is about 1 mm. Greater thickness is not desirable as the flexibility of the plate is a feature of the process.

The material used for mounting was 'Lassoband' produced by the firm of Beyersdorf in Hamburg. This also had a thickness of 1 mm. Hard-drying rigid adhesives were not recommended since a slight flexibility of the printing surface is desirable; the resilience of the 'Lassoband' permits the darker tones, i.e., the thicker portions of the image to yield to some extent under impression.

For letterpress, the plates could be mounted upon lead mounts; for direct litho they were mounted upon a thin litho plate of such thickness as to give the printing surface the cylinder diameter for which the machine was designed. No details of use in aniline machinery were given though this was stated to be possible.

Thinness of Plate

It was claimed that the plates could be put on the machine and after adjustment to approximately half the usual impression strength for similar subjects on normal letterpress blocks, the run was started. No underlay or overlay, or other make-ready was required but delicate roller setting was stated to be necessary due to lack of depth of printing surface and also the overall thinness of the plate and the 'Lassoband'.

No very clear explanation was forthcoming as to whether, when a series of halftones were mounted, the rollers ink-

ONE-WOMAN PRINTSHOP

Much has been written about one-man printing shops, but little about one-woman shops. The Canadian Weekly Editor reports that editor, reporter, compositor, pressman Mrs. Bernice Van Male of the Balcarres, Canada, Free Lance combines, her household duties with getting out a newspaper. She has her Linotype in the kitchen. Appropriately enough, one of her recent printing jobs was the production of a 200-page cookery book. Like so many of the women who have figured prominently throughout the history of printing, Mrs. Van Male took over the job when her husband died in 1947. In those days the type was all hand set but in 1953 Mrs. Van Male had a Linotype installed and in a couple of months had everything under control.

ed the 'white' margins, and it was noted that all specimens were trimmed to within less than ¼ inch of the edge of the picture and that the only sample of printing plate was trimmed flush to the image.

A CORRECTION

In our last month's issue on Page 18, we have wrongly mentioned the name of the Mayor of Madras as Mr. Ramanathan Chettiar. It should read Mr. M. A. Chidambaram. We deeply regret for this error.

ABOUT MATHEMATICAL SIGNS

OUR four principal mathematical signs—plus, minus, multiplication and equal—came to acceptance at different times. They were invented when necessity called for a distinctive symbol to give expression to the thought which the scientific writer had in mind. The complete history of these signs has yet to be discovered and all we know at the moment is rather indefinite. The plus and minus signs were, according to Updike in *Printing Types*, first used by a writer named Widmann in a book published in Leipzig in 1489, but he makes no special mention of them, nor does he suggest that they were his own invention. Many years passed before English writers and printers adopted the signs.

One of the first authors to use all four symbols was Robert Recorde, a native of Tenby, in Wales. He is called the Founder of the English School of Mathematics. It is not known when he was born, the *National Dictionary of Biography* placing a query after 1510. Recorde studied and later taught at both Oxford and Cambridge Universities, being elected a Fellow of All Souls, Oxford, in 1531, and taking his medical degree at Cambridge fourteen years later. He secured a position as Court Physician to Edward VI, and was then appointed Controller of the Mint at Bristol, afterwards being Surveyor of Mines and Money.

It was in his book *The Whetstone of Witte*, which was published in 1557, that the equal sign appears for the first time mathematically, although it was quite common in old manuscripts as a contraction for the word *est*. One of a series of post

cards issued by the Ashmolean Museum at Oxford, gives a reproduction of some lines from this book. They are printed in black letter. Although the phraseology and style are strange to our ears, the explanation is quite clear. Recorde says: "Howbeit, for easier alteration of equations, I will propounde a few examples, because the extraction of their rootes, maie the more aptly bee wroughte. And to avoid the tedious repetition of these woordes: is equal to: I will sette as I doe often in woorke use, a paire of paraleles or Gemowe lines of one lengthe, thus: =, because noe 2 thynges can be more equale." (Gemowe is from the French *gemeau* meaning twin.) The equal sign as shown is not the neat symbol we use. The two parallel lines are about 40 points long.

The same post card gives three lines of mathematical formulae in which are introduced three of the four symbols, the multiple being omitted. By using the plus and minus in these lines without comment, it appears certain that they were in current use. The omission of the multiple causes doubts as to its origin.

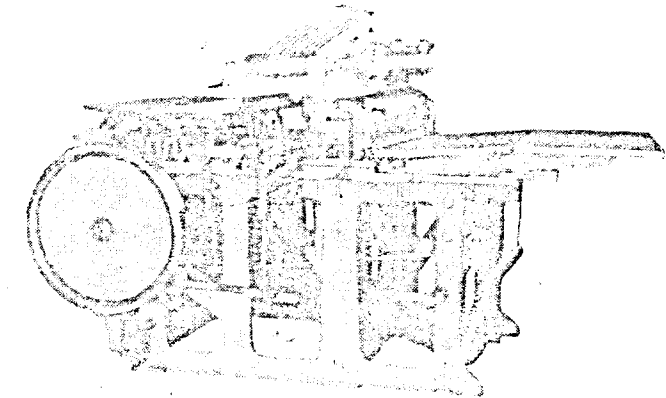
In 1542 Recorde published *Ground of Arts* in which he uses a cross which we would call a multiple. It is, however, clear from the context that, although it has reference to multiplication, it is not a multiple. The first appearance of this sign to be traced is in a translation in 1618 by Edward Wright of a work on logarithms written in Latin by John Napier. In this book the sign used is a lower-case italic *x*. Neither Napier nor

(Continued on page 16)

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THE ECONOMICS OF COLOUR MATCHING

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WHETHER we are conscious of it or not colour plays an extraordinary part in our daily lives and a very considerable number of people in many industries are engaged in seeing that we have around us shades and tones and colour combinations which are pleasing and effective. In, probably, no other part of the printing industry is the individual whim or fancy of the print user given such attention as in the matter of colour and, as every printer knows, the satisfaction of these demands is at times no easy matter. It would be unreasonable to expect the customer to understand how the many subtleties of colour effect are achieved and the problem is a joint one for the printer and the inkmaker—or more particularly for the machineman and the ink colour matcher. As we shall see later in this article the exact reproduction of a particular colour is the joint responsibility of these two individuals.

To Mix or Not to Mix

The stock of coloured inks held by a printing house is governed by the variety and type of work produced and in general little difficulty is experienced in satisfying the demands of the majority of customers. When the requested colour is not stocked the printer is faced with two alternatives, viz., (1) mix the colour himself using a combination of inks already in stock, or (2) submit the colour pattern and other details to his inkmaker for the shades to be specially matched. Factors which govern the printer's decision in this respect will be the quantity of ink involved, time available for completion of the job and whether it is an 'easy' or a

'difficult' colour to match. Since he seldom has a skilled colour matcher available on the premises the printer tends to mix small quantities of 'easy' colours himself and use the services of the inkmaker for all 'difficult' colours and for large quantities of colours which might be relatively simple in small lots.

Different Conditions

It is not always readily appreciated that the inkmaker has no *automatic* means of matching a colour. The skill of the colour matcher rests simply on his ability to make a mental break-down of the pattern into his own standards and to blend these colours in the right proportion to reproduce the original. How these proportions are arrived at, i.e., the mechanics of colour matching, is too big a subject to treat here. It is probably adequate to mention that it is not enough to produce a small quantity of ink which gives the required colour. The matcher must say exactly what percentage of each pigment is included in his recipe so that at any time in the future that particular colour can be accurately made up in any quantity the customer may require.

If the matcher were solely concerned with a uniform set of conditions his task would be immensely simplified, but he has to take into his calculations many factors such as the type, weight, and colour of paper or board, whether the forme contains large areas of solid, if the ink is being superimposed by or on another colour, and the type of machine being used. Any or all of these factors could affect the initial choice of pigments to incorporate in the final ink.

It can be seen, therefore, that the printer when producing a small quantity of ink quickly to a given colour approaches the problem in an entirely different manner to the colour matcher employed by an inkmaker. Whereas the printer is working with the actual forme and machine being used for the production of

the job, the matcher has to assess actual machine conditions and simulate them as closely as possible on his proofing press to ensure an accurate result. Furthermore the colour matcher must necessarily work on a laboratory scale and make certain that the recipe he produces is in such a form that bulk quantities can be

COLOUR MEASUREMENT DIFFICULTIES

LEADING the discussion on the 'electronic measurement of colours,' at the International Congress of Master Printers at Venice last year, Gilbert Smith, Technical Director, Hazell Watson & Viney, Ltd., said that he agreed that there were spheres in which the extremely precise specification of colour could be of practical use. He instanced the case of manufacturer who required millions of tooth-paste cartons and gave the job to half a dozen firms to print: in such a case there was a danger that the colour would vary between the printings; and the total variation after a few months could be considerable. Colour measurement could help ensure the retention of a standard once set: it would be a standard which would not fade, could be examined under any light, and could be given over the telephone.

At the same time, Mr. Smith considered that the benefits of colour measurement were not as numerous or as real as at first they appeared to be. The standard of accuracy of the electronic apparatus was 'rather more than was needed at present.' We had to face the fact that we might get little return for much money spent.

The Human Aspect

Also there was the human aspect. If the customer did not like, say 'yellow—xy 59' when he saw it on his proof, it would have to be changed to meet his wishes even if he had agreed on its specification in the first place. Moreover, some customers wanted to be free to change their minds: they did not want to be pinned down to an exact hue or shade.

In multicolour printing, we faced a 'jungle of difficulties.' Firstly, there was the difficulty that, although we printed the yellow, red and blue each within agreed limits of hue and shade, the final overprinted result might come right outside the limits set. Then there was a variation in the colour of the paper, which also affected the print. And the position became widely complex when a number of blocks, each made by a different block-maker and proofed with different inks on different paper, had to be printed in the same forme.

Optical Bleaches

A further series of difficulties was introduced by the now prevalent use of 'optical bleaches' in paper: here, blue fluorescing material gave apparent whiteness to a yellowish sheet when viewed in daylight or other light containing some ultra-violet radiations. Generally, the necessity to redesign completely press construction and inking systems and the necessity to introduce air-conditioning—prerequisites to control of the order of accuracy implied—made colour measurement 'rather terrifying.' Until all these difficulties could be resolved, less scientific methods seemed to be the only practicable alternatives.

made up in the production department, while the printer usually matches the colour and makes his bulk quantity of ink in one operation.

All Information Essential

It was stated earlier that the problem of achieving a particular colour was the joint responsibility of the colour matcher and the machineman. Strictly speaking, there is no such thing as a perfect colour match at the laboratory stage. A great deal depends on the machining conditions, including (among other things) speed, type of forme, and whether a particular printer tends to carry his colours rather full or rather spare. The colour matcher, who essentially has considerable knowledge of machine conditions, then produces an ink which should give the desired results provided those conditions fall within the limits he has estimated. For this reason the matcher expects the printer to provide as much information as possible about all aspects of the job. On the other hand, the machineman expects the colour matcher to produce an ink which will give the desired results with as little adjustment as possible. If for any reason machine or paper conditions are changed, further adjustment of the colour or strength of ink may be necessary to bring it once again within working limits.

The time taken for a colour matcher to arrive at a satisfactory recipe varies very greatly indeed according to the peculiar problems of the job in hand. It would be reasonable to say that even a highly skilled colour matcher cannot produce a difficult shade with an accurate recipe in under one-and-a-half to two hours, while he may strike unexpected difficulties in tones, especially if the ink is to be used on a non-white paper which

could easily cause him several hours' extra work. It must be obvious, therefore, that the cost of producing inks to colours specially demanded by the printer or by his customer is not inconsiderable and this must be reflected in some way in the price of the ink.

Special Properties

When special properties in an ink are requested such as soap, alkali, or spirit varnish resistance the range of pigments available to the colour matcher is severely restricted. To impart the desired properties to the ink he must use pigments which meet the particular specification. As these usually are much more expensive than the pigments which would normally be employed if colour were the only consideration, it is not surprising that a higher price must be paid for inks of special properties.

The Problem of Tints

One aspect of colour matching which is often not appreciated is that concerned with matching of tints. The print consumer, and frequently the printer himself, regards a tint as being simply opaque white or transparent tinting medium with a very small amount of colour pigment added. Physically this is perfectly true, but the colour matcher has learned by experience to regard a tint as one of the most difficult matching problems in his daily work, and it would be no exaggeration to say that a skilled matcher may spend anything up to half-a-day or more in achieving the exact shade of a delicate tint, and in working out and checking back the proportions of material used. Because of the considerable work involved, there is little wonder, therefore, that a tint specially matched would appear to be much more expensive than is just-

fied by the relative cost of the constituent materials.

Matching by Instruments

'Why don't you use instruments for colour matching?' is a question frequently asked especially when some of the difficulties of matching are being discussed. The answer is both a simple and a complicated one. The simple answer is that an instrument can give a colour assessment or breakdown of any pattern, but as we have seen, this part of the matching job is already fairly rapidly carried out by means of the colour matcher's knowledge of pigments. The machine can also make a comparison of colours and show differences in hue. The difficult and time-consuming part of the matcher's job is the synthesis of constituent colours to achieve a particular shade. This is where the human eye scores since no instrument yet devised can carry out the rapid check and cross-

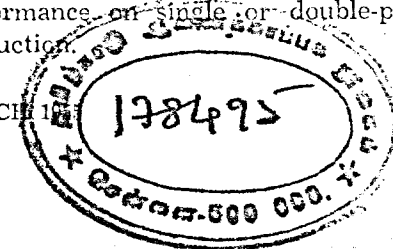
check necessary in working towards the correct result.

The very large range of standard colours produced by most ink-makers should be of considerable assistance to the printer in advising his customers, and it is felt that on many occasions special matchings of colours are ordered without a full realisation that the slight alteration from the standard colour which may be involved increases out of all proportion the cost of the ink used on the job. It is also apparent that when special makings of ink involving only a few pounds are ordered, the cost of matching comprises a disproportionate part of the selling cost. While it is difficult to say at precisely what level the cost of making a special ink shows no appreciable increase in the selling price, it can generally be stated that quantities under about 12 lb. must be uneconomic when compared with the price of standard lines.

SHRINK PROOF & TEAR RESISTING WRAPPING

An American company has introduced a shrink-proof and tear-resistant transparent wrapping material, it is reported in *Packaging Abstracts*, published by the Printing, Packaging & Allied Trades Research Association, Britain. The material, a laminate of cellulose film and polyethylene, has excellent tensile, burst and tear strength, and high fold endurance. It retains high vacuum over a wide temperature range and uses no binders, adhesives or connecting agents. A machine designed to make pouch-type containers from materials such as this has been developed, which is reported to have a high-speed performance on single or double-pouch production.

Developments in the field of packaging machinery include an automatic polyethylene bag maker; a packaging unit specially designed to handle unsupported polyethylene film; a new precision filling machine which makes up to 150 fills per minute which is particularly suitable for liquids, powders and viscous products; an automatic machine for taping different-sized units with a capacity of 67 packages per minute; and a high-speed case sealer which deposits drops of adhesive on the flaps of a case while they are in a vertical position. When they are folded down, the droplet is aerated around, the circumference with faster setting resulting.



KALA NIKETAN, JABALPUR

SRI M. S. KRISHNAMURTHY, B.A., L.P.T., a Full Member of our Federation who was recently appointed Chief Instructor, Printing Technology course, at Kala Niketan, Jabalpur, Madhya Pradesh, has sent us a booklet issued on the occasion of the Republic Day Celebrations in January 1955. The booklet is perhaps the first fruits of his labour after taking charge of the newly started Printing Section.

Kala Niketan, according to the booklet is "a Senior Technical Institute or a Polytechnic, catering for eight different, well-defined courses of two years' duration each, meant to train up the youth after the High School stage for entry into life and gaining their livelihood for being absorbed in the industrial undertakings with proper apprenticeship in the supervisory cadre of service." The booklet gives details of these courses and also details of all their co-curricular and extra-curricular activities.

The certificate course in Printing Technology of two years' duration is the latest addition, started in this academic year. "Practical training is given to the students in harmonious combination with that much theoretical background so as to make them handle any situation independently and with confidence. Elementary principles of Mechanical Engineering, Electrical Engineering, Machine Drawing form the special features of this course which is unique in itself and is the one of its kind in India. The aim is to create in the minds of young students a confidence to do things independently, an enthusiasm to work and become designers—thus to contribute their mite to the fund of Printing Technology."

The course includes (1) Relief and

Lithographic Printing, (2) Hand-set and Mechanical Composition, (3) Process Block Manufacture, and (4) Book and Stationery Binding.

We congratulate the authorities for this bold venture and Sri M. S. Krishnamurthy and his students for the production of this booklet.

* * *

FROM MADRAS TO ADEN

We also take this opportunity to congratulate another member of our Federation, Sri S. RAMASWAMY, L.P.T., who has taken charge of the Government Press, at Aden as Superintendent. He was also the member of the first Executive Committee of IFPT. He was the Manager of Amra Press, Ltd., Madras, at the time of appointment.

Our best wishes go to these two members for a bright career in their new posts.

Members who take up new appointments or get promotions are requested to send us details both for publication in PRINTECH and for our files.

Late Mr. S. APPADURAI PILLAI

We deeply regret to record the death of Mr. S. Appadurai Pillai, retired Assistant Superintendent, Government Press, Madras and a former visiting lecturer in the Printing Section, Central Polytechnic, Madras. The death occurred on March 21st, 1955. He was sixty-seven. The late Mr. Pillai was a pioneer in the field of printing education and was the author of the following books: 'Printing Technical Terms,' 'Printers' Arithmetic,' and 'Imposition Schemes.' He was awarded a gold medal by the Monotype Corporation Ltd., for his work on the Tamil keyboard.

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The second and concluding article on

The Care and Use of PRINTING ROLLERS

By J. CRAVEN

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THE importance of regularly washing-up the rollers cannot be too highly stressed. It is surprising how frequently this is neglected and looked upon as unnecessary. They should be washed-up every night; where a quick-drying ink is in use an extra wash-up should be given before the lunch hour, as if ink is once allowed to dry on them their surface is irreparably destroyed.

The rollers should be carefully lifted from the machine. On large machines this is best done by two persons, one at either side, to avoid the risk of the spindle ends being bent or the composition damaged as they are withdrawn. They should be leant against the side of the machine or in any other suitable position in correct order, so that after washing they are returned in the same order to their positions on the machine. If they are not replaced in their previous positions, they will have to be reset before running the next morning as their diameters are not always exactly the same.

The finest washing-up medium is mineral oil, as this helps to revive the roller and restore its surface. However, it is a rather slow and painstaking operation, and paraffin oil or kerosene oil are generally used. It is often necessary to stop the machine in the middle of a run to wash and brush out the forme. A volatile spirit, on account of its quick evapo-

ration, is usually used for this purpose, but on no account should spirit, turpentine, petrol, etc., be used for washing the rollers. The effect of spirit on a roller is to form a skin, which becomes hard and glossy, destroys its tackiness, and contracts the outer surface of the roller; but the core does not contract, and so after running for a short time it expands and cracks the outside surface. Avoid any mixtures containing water. After washing-up, the rollers are improved if wiped over with some machine oil and not left exposed to the atmosphere.

The foregoing gives a rough outline of the roller's treatment before use. There now remains to be dealt with the care of the roller during use. The roller, being delicate, is readily susceptible to injury, and following are some of the principal and most common harms which may befall it, the causes, and, where possible, a remedy. It must be added, however, that if the advice already given is carried out a number of these troubles are not likely to happen.

Causes of Plucking and Fretting

Rollers put on the machine before they are properly matured: their surface, still being tender, breaks away in small pieces.

Running either dry or with an excess of ink at the ends, causing undue friction; usually occurs where a short

forme is being worked. (*Remedy*: put some oil or grease on the edges of the ink table or roller ends to minimize the friction generated.)

New rollers after a few hours' running expand slightly; if the setting is not re-adjusted they will become too "hard-on."

Faulty setting: rollers set too "hard-on" at one end or with an unequal pressure along their entire length.

Rollers which have swollen through absorbing moisture, rendering their outside surface soft and weak.

Causes of Cracking

Certain inks have a more deleterious effect on the rollers than others, and it frequently happens that with some colour inks the rollers crack. It is difficult to give any definite explanation for this; but it should be understood that such inks have a high pigment content, causing greater friction with the resultant softening of the rollers. Further, a number of these inks have a vehicle of lacquer varnish or contain quick-drying properties, and while the machine is running the ink nearest to the rollers' surface (accelerated by the warmth of the rollers) dries, forming a very thin skin. This skin adheres tightly to the composition which owing to the constant revolving of the rollers, is being continually broken and reformed, and as it breaks it tears the surface of the composition. These cracks, although minute at first, gradually deepen longitudinally on the continued running. There is no remedy for this, but it can be lessened by setting the rollers as lightly as possible.

Ink left to dry on the rollers, with the result that on further use this skin of dry ink bursts and tears the composition.

Washing down with water or a solution containing water. The water extracts the glycerine from the outer surface of the roller, causing it to dry up, while the composition nearer the centre (not being affected to any great extent) does not contract, with the result that longitudinal cracks appear on the surface.

Washing down with a spirit.

Inks containing linseed rosin or other rosin derivatives. These have a dehydrating action.

Sometimes "fresh" ground linseed oil inks result in cracking, whereas "aged" inks do not. Free acid in the fresh ink may be the cause of this.

Surface smoothness and Loss of tackiness

Washing down with a spirit.

Too much exposure to the atmosphere. (*Remedy*: put a thin layer of oil on the rollers when not in use.)

Ink left to dry on them.

Certain inks, such as scarlet lakes, may contain a slight excess of lead acetate to stabilize the colours. This will form a compound of a hard, insoluble nature with glue, producing a hard skin on the roller, thus destroying its tack and making it lifeless.

A very dry machine room with low relative humidity will make the rollers shrink excessively, causing hardness and loss of tack.

Causes of burred or rubbed surface

Faulty setting, where the ink table is bumping the rollers, especially the distributors and ducters, causing their surface to become burred and crinkly.

Bent roller spindles, causing the rollers to run eccentrically and therefore subjecting those surfaces which are making

contact with the ink table to excessive buffeting.

Rollers which have got damp. Their outside surface is rendered soft and frangible through the absorption of moisture.

Causes of rollers not inking evenly

The rollers get warm while running, and at night after washing they are placed back at rest on the machine. The composition being soft tends to sag towards the middle of the stock—the larger the roller the greater the effect—and on cooling during the night they set firm in this position, with the result that on starting to run the next morning they are not inking along their whole length.

(Remedy: This is most noticeable on cold mornings, as the rollers contract more in cold than in warm weather, but after running for a short time they become restored to their original shape. It is sometimes expedient to run the rollers dry for about five minutes on these occasions in order to soften and expand the composition.)

During the winter months and first thing in the morning, particularly Monday morning after the week-end's close-down, trouble is often experienced with the rollers not inking because they have contracted and become hard. (Remedy: The whole trouble is that rollers are extremely susceptible to temperature and humidity changes. Precautions can be taken to help this trouble, but they cannot be reckoned as a solution. During cold weather take extra care on Friday night to cover the rollers with oil or grease, which will help to minimize the effect of temperature drop. If the rollers can also be put in cupboards to protect them from draughts, etc., so much the better.)

Causes of Composition loose on the stock

Rollers set too "hard-on," causing binding and exerting excessive twist on them.

The roller becoming punctured owing to accident, and the ink, etc., getting under the composition, destroying the adhesion to the stock.

Causes of bursting or running off

In hot weather, especially on fast-running machines, it is not uncommon for this to happen; also when running with a stiff varnish or certain colour inks.

(Remedy: Set the rollers as lightly as possible to the ink table and vibrators. Watch them carefully, and on the least sign of them going too soft take them off and replace with the spare set. Allow the set that has been taken out to cool down and firm; they will then be ready for use again.)

Roller set too "hard-on," causing excessive friction until eventually they melt.

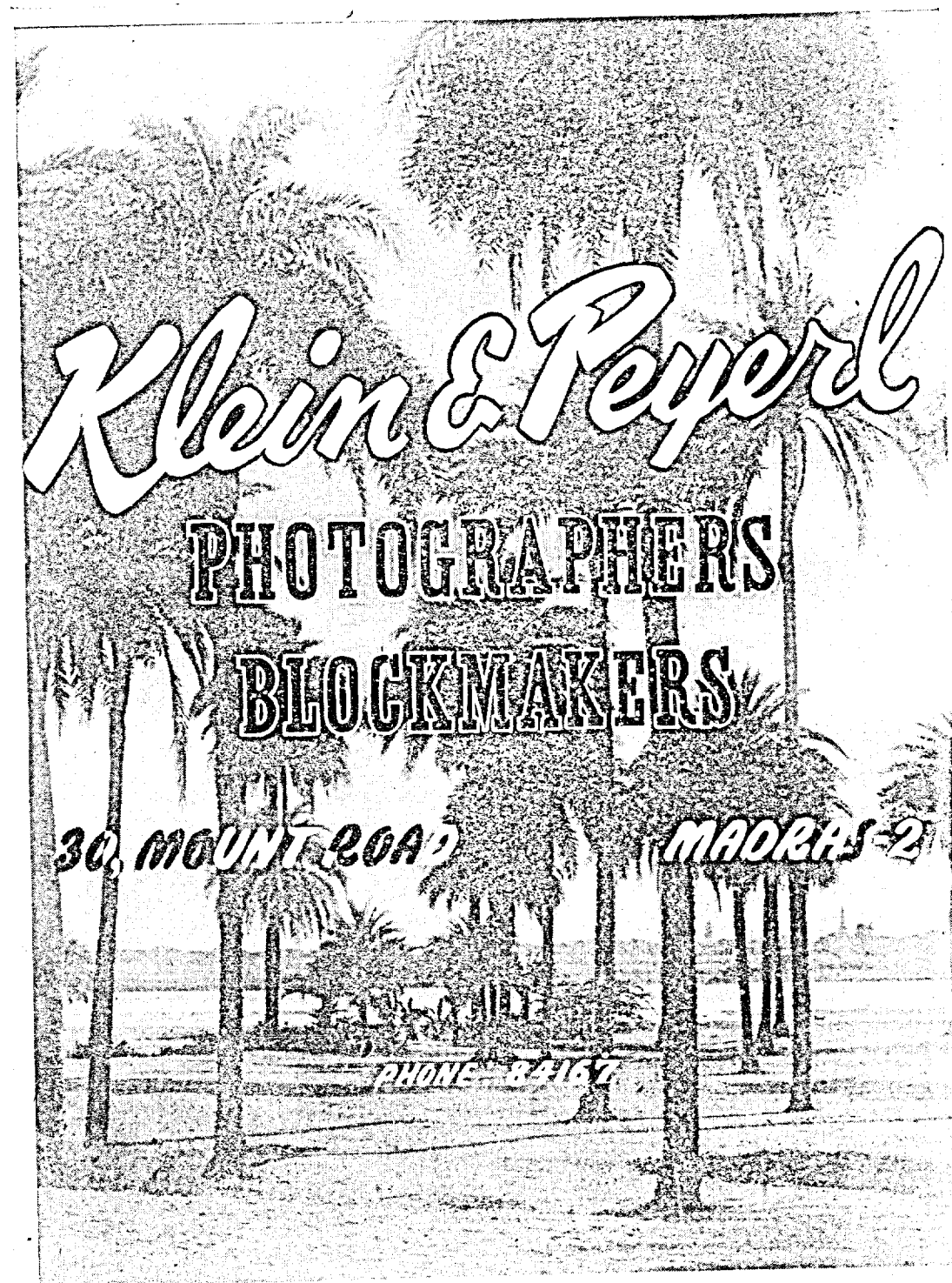
Rollers running on a machine exposed to the sun.

In conclusion, consult your roller maker. There are so many different mixings of composition to suit different conditions inside a printing works. Do not always blame the roller maker.

ABOUT MATHEMATICAL SIGNS

(Continued from page 6)

Wright comments on the sign as a novelty. Another reference is given by Updike, who says that William Oughtred showed the sign of multiplication in 1631. But that is a good deal later than Wright, although Oughtred did use the symbol $\times$ which we recognise.—By kind courtesy of *The London Typographical Journal*.



SOME MORE STALLS AT THE PRINTERS' EXHIBITION

INDO-EUROPEAN MACHINERY CO., LTD.

THE above well-known firm selling many kinds of famous printing machines of foreign make had a stall in the All-India Printers' Exhibition at Madras. The machines for which they are agents were all displayed at the East German Polygraph stall. The Indo-European stall was utilised for transacting business where the visitors were shown some exquisite specimens of multicolour printing turned out by Roland offset machines for which they are the Indian agents.

The firm's foreign sales organiser, Mr. Fred Wichmann, was present at the stall throughout the Exhibition to discuss problems with printers and to give advice on technical and commercial matters.

PRINTING ROLLERS

Two firms dealing with printing rollers also took stalls to exhibit their products. They were the Madras Rubber Factory and Ratna Chemical Works, both of Madras. The former exhibited rubber rollers of various sizes and the latter composition rollers cast by them. These firms have their factories at Madras and undertake manufacture and servicing.

WANTED

An L.P.T. to work as Salesman to push printing inks of a reputed firm on commission basis. Apply to the Hon. Secretary, Indian Federation of Printing Technologists, 61 Armenian Street, Madras-1.

REPRODUCTION PROCESS ON ASTRALON

We made mention of this process in our last issue, which was exhibited by Rangam Bros., Madras, in the Printers' Exhibition last month. More details are given below of the process.

This process is helpful in taking duplicate films in line or screen positives without making an intermediate negative. No dark room or photographic materials are needed for this process.

Astralon duplicates are dimensionally stable and do not have surface coating. In other words the material itself is coloured wherever the design appears. This prevents deterioration and free from wiping and scratching. This Astralon print can be used as a good media for publicity. This process is useful for production of geographical maps.

LOCKING-UP LARGE BLOCKS

When machining large blocks for such work as book jackets it may often be found that the plate will tend to shift in the course of the run. When the finished job will bleed off, or the extent of trim is otherwise sufficient, any tendency to shift may be prevented, and good register maintained, by having an 18-pt. brass rule inserted at the foot of the block when locking up the forme.—Caxton Magazine

SITUATION REQUIRED

REGIONAL SCHOOL OF PRINTING, MADRAS

THE Government of Madras have accorded sanction for the development of the Printing Section of the Central Polytechnic, Madras into a Regional School of Printing Technology.

This school will cater to the needs of the States in the area, viz., (a) Andhra, (b) Coorg, (c) Hyderabad, (d) Madras, (e) Mysore, (f) Travancore-Cochin and will be started from the session commencing in July 1955. It is proposed to have the following ten courses:

1. Hand Composition and Proof Reading.
2. Lino and Intertype and Proof Reading.
3. Mono Key-board, Mono Casting and Proof Reading.
4. Letterpress Printing.
5. Lithographic Art Work.
6. Lithographic Printing, Lithographic stone and plate-making.
7. Photo engraving, Camera Operation.

8. Photogravure plate-making, Photogravure Printing.
9. Binding and Stationery manufacture, Packing manufacture, and
10. Silk screen Printing.

The courses offered are proposed to be in two stages.

1. All-India Certificate course in Printing and Allied Technology—Part time course of three years duration.

2. All-India Advanced Certificate course in Printing and Allied Technology—Part time course of two years duration.

The first course is open to apprentices engaged in industry or junior journeymen employed in industry.

The second course is open to those who have satisfactorily completed the All-India Certificate course.

The present diploma course in Printing Technology of the Polytechnic will continue to remain as such.

PLASTIC POSTER TYPES

THE Berthold type foundry of Berlin and Stuttgart has been supplying poster types made of plastic or special light metal for several months. Plastic type, which is sold under the name *Plakadur*, is water-proof, and strongly resistant to acids and other chemicals, especially of the type contained in printing inks and cleaning solutions. *Plakadur* type can stand temperatures upto 194° F without becoming deformed in any way. This plastic type is light in weight but extremely

tough and actually more durable than conventional metal type.

For embossing, stereotyping and vulcanising, light metal alloys of the types are also cast by the same foundry. In these types the face is deeply cast so that clear embossing pictures are more easily obtained. The light metal alloy used for this type can withstand temperatures upto 570° F. Both new poster types are supplied in sizes from 72 to 240 points and already a fairly wide range of type faces and also a few typographical signs, are available.

THE IMPORTANCE OF Theory & Practice

By D. RAMALINGAM
Student, Central Polytechnic, Madras

"Tools, however ingenious, and knowledge, however complete, will ever be dependent upon a right application and skilful handling."
—A. Seymour

CHANCES of learning the art preservative of all arts are now high. We, the young printers, have now got golden opportunities for learning. Formerly, the craftsman suffered from lack of education in his craft. Now those who have some basic educational qualification like S.S.L.C. undergo training in Printing Technology and get certificates and diplomas.

Then what is the reason for the bad print that is produced? It is only due to the lack of pride in our craft. So the education which we receive must also give us the necessary pride in our trade. But, generally, the student after finishing his training course and getting a diploma or certificate, thinks himself as an all-round master of the trade and thinks it is not dignified to work with his hands. This is an absolutely wrong view. So, we, of the younger generation, must first realise the value of the dignity of labour. Soon after finishing the course and getting diplomas how can we expect to draw salaries of Rs. 200, or so. But though we don't become experts in the trade we are confident we will prove our worth if we are given a chance and

encouragement. If we only work with pride and show deep interest in our training and work efficiently, ours is certainly a paying trade.

Another thing to remember is that neither theory nor practice alone will make us expert craftsmen or Master Printers. As a matter of fact, both are inter-related. By means of theory we can know correct terms and principles. How many in our trade use the correct terms for various operations and materials? On the other hand, without practice we cannot go ahead with the theory. This is not the job of merely mugging up notes and passing an examination. It requires good deal of practical experience. To become thorough in our trade wholly is an impossible task! Because printing comprises so many different branches like letterpress, lithography, photogravure, etc. Some say we can read about all these things and gain knowledge. Of course, we can gain knowledge, but not on both sides thoroughly, i.e., theory and practice. For example, in letterpress itself there are many branches and departments. How many are thorough in all of them? There are experts in each but not in the whole. So to become an expert in the trade will mean much experience and not merely reading. Both must go hand in hand.

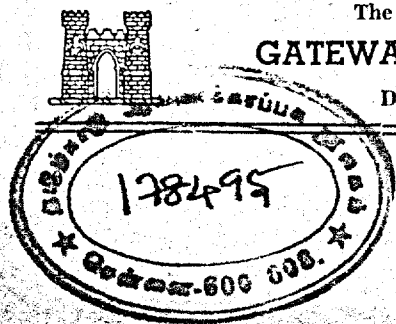
Theory gives ideas and hints to practice. Practice gives scope for expansion of ideas. So we cannot forego either theory or practice!

As such, let our motto be theory combined with practice!

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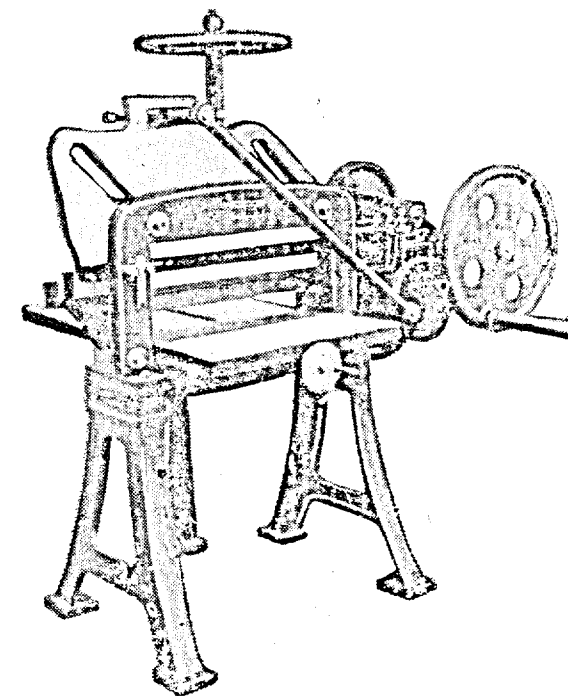
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Vol. II

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No. 9

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Vol. II APRIL 1955 No. 9

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are invited for publication
from Master Printers, Techno-
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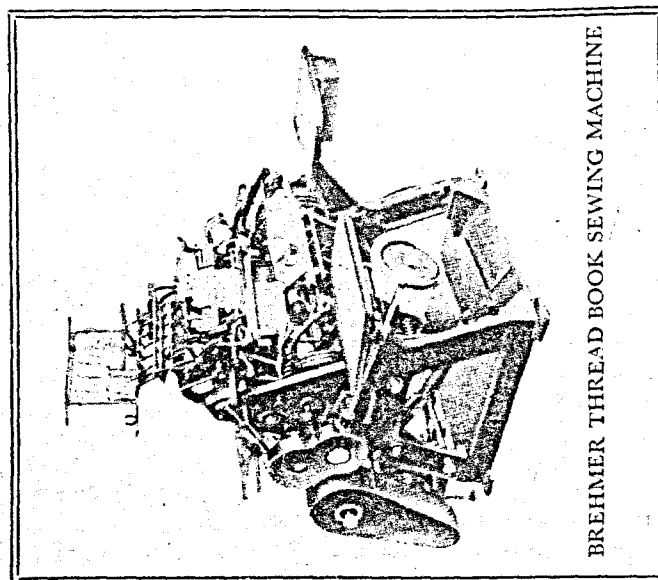
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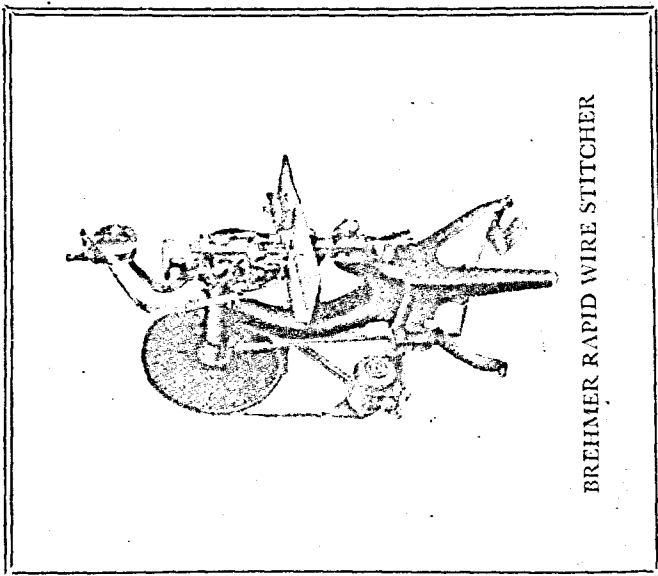
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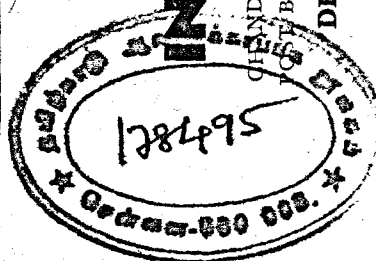
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I F P T PRESIDENT GOES ON WORLD TOUR

Mr. R. Siddique, D.I.P. (Lond.), M.I.P.M (Eng.), President of the Indian Federation of Printing Technologists and Superintendent, Government Press, Madras, left Madras on 26-4-55 by air to Bombay on the first lap of a world tour to study latest printing techniques. In a period of four months he will visit many important printing centres of Europe, Great Britain, United States of America, and Japan. The tour will be entirely by air travel and he will return to Madras by the middle of August. Mrs. Siddique will accompany him in his European tour and upto London.

During his stay in Britain, Mr. Siddique will visit the Tenth International Printing Machinery and Allied Trades' Exhibition (IPEX) at Olympia, London, between 5th and 16th July. He will also avail the opportunity of visiting the Institute of Printing Management, England, of which he is a Member. He will devote a great part of his tour to the U.S.A. which he is visiting for the first time.

He will visit both manufacturing and printing houses. He will pay special attention to institutions training printers and the methods adopted by them.

The first part of Mr. Siddique's tour starts in Italy where he will visit Rome and Milan for about a week. Among the leading centres he will be visiting in Europe are: Geneva, Zurich, Frankfurt, Munich, Vienna, West Berlin, Hamburg, Oslo, Copenhagen, Dusseldorf, Amsterdam and Brussels.

In Paris and London he will stay for about a month when he will also make a short trip to Ireland.

The first hop in the United States will

be at Boston. His itinerary in America includes the following centres: New York, Montreal, Philadelphia, Washington, Detroit, Cleveland, Chicago, Omaha, Denver, Cheynne, Salt Lake City, San Francisco, Los Angeles, Honolulu and Wake Island.

In Japan he will go round all the leading manufacturing houses of printing machinery besides printing firms. His other stops in the East will be: Manilla, Hongkong, Singapore, Bangkok and Rangoon. He will return to Madras from Rangoon via Calcutta.

Many friends and well-wishers of Mr. Siddique were present at the Meenambakkam air port on 26-4-1955 to bid him *au revoir* and to wish him *bon voyage*.

A Master Printer's Appreciation

Sri Brij Lal Baluja, Proprietor of Baluja Press, Delhi and President of Delhi Printers Association writes:

"I was in receipt of your PRINTECH Issue No. 7 of February 1955. I have gone through its contents. Besides the fuller report of the activities of the All-India Federation of Master Printers and All-India Printers' Exhibition held in Madras, the special subjects dealt with are very useful and important. The general get up and printing is of the high standard.

"I quite agree with your editorial 'A Happy Concord' and believe that All-India Federation of Master Printers and the Indian Federation of Printing Technologists can and should co-operate to raise the standard of Printing. I wish that All-India Master Printers' Federation could patronize the PRINTECH rather than to start another paper of their own, which they contemplate to do very shortly."

PATRA

PRINTING, PACKAGING AND ALLIED
TRADES RESEARCH ASSOCIATION

LEADERS of printing industry in India and others interested in our industry have recently stressed the necessity for a Research Institute for Printing. Every country in the West which has advanced considerably in Printing Technology owes it to a research institute organised collectively by the industry or to large printing establishments having their own research departments. A Printing Research Institute is an urgent necessity to our country not only because we are far behind the other countries in this field but also because conditions conducive to good printing are mere varying and the problems facing us are more complex than in other countries.

In this issue we give detailed account of one such institute—The Printing, Packaging and Allied Trades Research Association of Britain (known familiarly as PATRA)—which was started 25 years ago by the collective membership of the Master Printers there and which has earned world-wide reputation for its great work. India has already made a close contact with this Association by the visit of Dr. G. L. Riddell, its Research Director, a few months back, to the Central Food Technological Research Institute, at Mysore to study our special food packaging problems. (Refer January 1955 issue of PRINTECH.)

We are sure that PATRA will offer us all the help in organising an Institute in our country and we hope the Master Printers and the Government will make a united effort to start it as early as possible and in the meanwhile use the good offices of PATRA to solve some of our more pressing problems.

PRINTECH

APRIL 1955

PATRA has its own building at Leatherhead which is modern, well-lighted, compact, and beautifully situated. Its staff is literally hand picked and "seems to fall into two distinct groups—university trained 'boffins' and practical printers," according to the *L & M News*, which adds: "The former might appear at a casual glance to be rather out of touch with the hard facts of a printer's life. Compensating for this, however, are the other members of the staff who by keeping in close touch with printers of all kinds—by letter, telephone, and personal visits—manage to associate (or perhaps, directly relate, is a better phrase) research with current printing developments."

The main link between the printer and PATRA, other than the subscription, is the enquiries department which handles about 1,500 problems a year. These may vary from a simple but probably irate query relating to blocks printing badly (necessitating merely straightforward visual inspection and recommendation) to a complex problem of discoloration of ink (which may actually initiate a whole series of chemical experiments in three or four different laboratories).

SPECIALISED LABORATORIES

These laboratories, of which there are about a dozen, are individually devoted to particular types of problems. These include subjects such as adhesives, microbes, paper, plastics, varnish and ink. Here are funnelled all the specialised enquiries; and at the same time experiments are progressing in each on certain pertinent problems which have been scheduled for investigation by the Research Committee of PATRA at the beginning of the year. The findings on all

the research projects are published and available to members.

There is in addition much practical machinery, including process cameras, stereo and electro-plating plant, and equipment for testing the durability of packages which in its severity would compare favourably with the "left-luggage" room at some railway terminus.

Lastly, there is a print shop, where many jobs which have gone wrong in the trade are reworked and analysed. Old machines are replaced by new ones maintaining the establishment's principle that only the best is good enough for research.

We give below extracts from the speeches made by Dr. G. L. Riddell, Director of PATRA research, at its 23rd and 24th annual general meetings in 1953 and 1954 which will be of interest to our readers.

RESEARCH PROGRAMME

Outlining the activities of PATRA, Dr. Riddell said in 1953: "In the printing division, research is in hand on some 23 problems covering letterpress printing, lithography, photogravure, process engraving, stereotyping and book-binding, as well as the printer's main raw materials—ink, paper and board. New items have been added to the programme, including improvements in deep etch lithographic plates, the emulsification of lithographic inks, speedier and more efficient methods of washing up machines, ink-fly and improved methods of controlling the colour on the sheet as it is being printed.

"On the research programme of the packaging division there are 15 items, concerned with the strength of packages and the protection they give to the contents against mechanical damage, mois-

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PRINTECH

5

ture, odour, mould and insect attack. Three new items have been added to the programme—improved methods of cutting and creasing carton board, adhesives and the effect of processing on the properties of transparent wrapping materials.

LIBRARY SERVICE

“Another important aspect of PATRA’s activities is the library service. The library staff have compiled each month *Printing Abstracts* and *Packaging Abstracts*, and it is true to say that these two publications have built up a high reputation for PATRA in many parts of the world. So much so, that negotiations are now proceeding for their bulk sale in the U.S.A. and Canada and financial arrangements have been made with the Dutch Printing Research Institute to enable them to use *Printing Extracts* to supplement their own library service.

“The number of loans made from the library has increased during the year by 30 per cent and now runs at the figure of nearly 6,000 loans a year.”

Dealing with the problem of “making known what is going on,” Dr. Riddell said: “Last year there were 65 publications from PATRA; 17 exhibitions have been staged in various parts of the country and seen by several thousands of people; 21 lectures have been given by various members of the staff to various trade bodies; the trade press has given a good deal of space to PATRA’s activities; there have been about 1,000 visitors to the laboratories at the Leatherhead; several firms have sent members of their staff to the laboratories to spend time (ranging from several days to several months) in learning research techniques and collecting the latest information; and representatives of PATRA

have served on no less than 50 different technical committees concerned with printing and packaging.”

At the 24th annual general meeting last year Dr. Riddell said: “Our programme of research has followed similar lines to that of the previous year; and this is to be expected, since major research items do not change markedly in the course of a year. I can say, however, that with every item, progress has been made. On the printing side, a programme of research on assessing print quality has been agreed and good progress has been made with another new item—the control of colour intensity as the sheet is being printed.

“It has always been part of PATRA’s policy to help members with their day-to-day problems and during the year that side of the Association’s activity has shown a considerable increase: the number of enquiries dealt with has gone up by 10 per cent.”

EDUCATIONAL SIDE

Dealing with the need for development of an educational side and marketing of ‘research inventions,’ he said:

“We have in the past held a series of courses for lithographic overseers and they have been a great success. In my view, it is very necessary that we should provide facilities for these and similar courses to be run almost as a constant part of PATRA’s activities and to ensure that they be run in such a way that they do not interfere with the research and enquiry work of the Association. It is essential that the courses should be of a residential nature and that they should be held at a PATRA’s establishment.

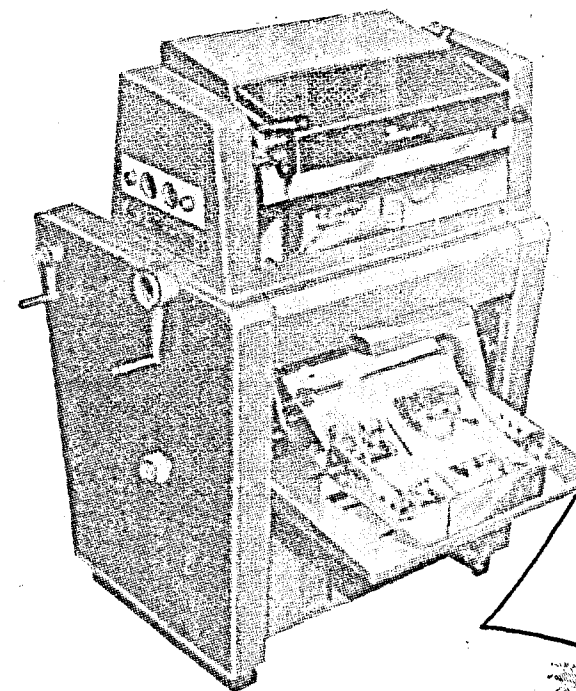
“The second major addition which I would like to see put in hand is the pro-

“How’s Business?”

You should be getting your share. Never was there greater need for print. We are back to competitive times. No matter how small, how large, whether office or heavy industry, print is in demand. It is the life blood of business. The manufactured article must be given publicity, colourful leaflets, booklets, window bills, show-cards, and circular letters. This is the unending and everlasting stream of print that comes within the scope of the Rotaprint Model R.30/90. Can you offer such a comprehensive range of print all on the one machine?

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vision of adequate facilities for the development and marketing of what might be called PATRA's 'research inventions.' Already we have some 30 items which in one way or another are sold to the printing and packaging industries and which, incidentally, result in a small addition to PATRA's income. The item may be a process, or a material or a piece of apparatus, and we have not yet found the best method of marketing these products to the benefit of members and of PATRA."

AVERAGE SUBSCRIPTION

"The average subscription to PATRA is £70 a year, ranging from £10 paid by the smallest printing firm to £800 contributed by the largest organisation interested in both the packaging and printing divisions. For £70 a month," said its chairman in 1953, "you could not engage a first-class scientist for your private laboratory, but for £70 a year as an average subscription, each member has on tap the resources of 33 experienced scientists, their assistants and the finest collection of scientific equipment appropriate to the graphic arts and to packaging of any single laboratory in the world."

"There are still, I regret to say, many firms in this country who for one reason or another have not yet joined PATRA," said its chairman last year, and added: "When one considers the size of the printing industry in this country and of the manufacturing interests who use packages of one kind or another, one realises the large field of potential membership which exists for PATRA. The basis of co-operative research is that the subscribers share the cost and enjoy the results equally."

PATRA in 1947 had a total income of £42,000 and a staff of 36. For the

year 1953-54 the income rose to £82,000 and the staff to around 80. There are two full-time printing liaison officers and, as fast as they are able, they visit members in turn to discuss their production problems with them and to explain how PATRA can be of assistance.

SOME RESULTS

We give below results of some of the experiments conducted by PATRA, during the last year as reported by its publication *Patra News*:

NEW APPARATUS TO MEASURE SIZE OF CUT AND CREASED CARTON BLANKS

PATRA has developed an apparatus for measuring the size of cut and creased carton blanks. The apparatus, first shown in public at its annual general meeting exhibition last June, is an outcome of a research project to find out how accurate are present cutting and creasing methods. The instrument, described in an interim report published by the Association, can also be used for measuring the depth and width of creases.

The apparatus, in effect, is a travelling microscope which enables measurements to be taken not only of the overall dimensions of a blank, but of the relative positions of the crease lines. An important feature of the apparatus is that the problem of taking measurements from the centres of creases is overcome by using what is termed as a 'shadow profile technique.'

In this technique, a shadow of a fine wire is thrown across the crease, thus revealing its contour from which the width and depth can be measured. A camera attachment enables permanent records to be obtained.

After cutting and creasing and before measuring, the carton blanks may change in size due to humidity variations. So that these changes may be detected and allowed for, carton blanks being collected for examination are stamped with a grid of pin pricks immediately after cutting, which serve as reference marks when the cartons are subsequently measured. As the blank carton changes in size, so will the spacing of these reference marks, thus providing a ready means for correcting the final measurements.

HUMIDITY CABINET AVAILABLE

A new humidity cabinet which has accurate control, is reliable and is not costly, will be available to the trade shortly. The technical features of the apparatus are the result of extensive laboratory tests at the PATRA. Details of the cabinet were given in the September issue of *Patra News* (Packaging Division).

In carrying out water vapour permeability tests on packaging materials and the shelf-life of packages, controlled conditions of humidity and temperature are required. As a result, a need has been felt for a simple type of cabinet which would meet the specialised requirements of this work. So, in consultation with a manufacturer of this type of equipment, designs were prepared and recently a series of tests have been carried out on a prototype model which proved very successful. Details of the comprehensive tests are given in the report.

The cabinet, which has a cubic capacity of 6 cu. ft., operates at temperate and tropical conditions within the approximate range of 30-90 per cent R.H. An alternative model with a refrigeration unit is also available.

One of the important features of the design is that special care has been taken to ensure uniform control throughout the cabinet. Also, the design ensures a sufficiently rapid rate of recovery. Humidity is controlled by means of salt solutions which do away with the need for elaborate control systems, thus contributing to the cabinet's relatively low cost.

PAPER EFFECTS ON INK DRYING

THE Association conducted an investigation into the effects of fibre beating, size and alum additions in paper making, on drying times of printing inks. This investigation follows an earlier series of experiments into the influence of acidity in paper and relative humidity on the oxidation drying of prints made with experimental papers. The latest series of tests, made with a bleached sulphite furnish, are recorded in an interim report which is reviewed in an issue of *Patra News*.

The report states that the main variables in paper making which have been studied (degree of beating, amount of size added and the amount of alum used in conjunction with the size) did not have a significant effect on ink drying over the range investigated. The authors confirmed the very marked effect of relative humidity on ink drying independently of the paper making conditions.

An interesting point in connection with the influence of relative humidity is brought out in the report. It is stated that since prints are known to dry more slowly at a higher relative humidity, it was decided to investigate what effect atmospheric conditions have on drying times not only during the drying period, but at the time of printing. Says *Patra News*: "The tests indicated that the relative humidity of the atmosphere is

just as likely to affect drying immediately after printing as when stacked overnight."

BOOK CLOTH ABRASION TEST

PATRA has developed a flex-abrasion wear test with the object of allowing book-binders to choose a covering material for a particular type of book and be sure that it will have the right wearing qualities. It is hoped that the test will ultimately enable manufacturers to provide cloths of specified wear-resistance.

This test is the result of a research project aimed at preventing one of the main causes of breakdown of bookcovers—wear along the hinge and spine caused by constant opening and shutting of the covers, and through continual handling.

No test has hitherto existed for measuring the resistance of different covering materials to hinge and spine wear. PATRA's test will, it is hoped, enable book-binders to obtain the most suitable cloth from a range of samples.

In the test, a specimen piece of cloth is rubbed over a thin rod at high speed. This produces both flexing and abrasion until the cloth eventually breaks. The number of rubs needed first to expose the base cloth and then to break the specimen altogether are recorded so that figures relating to the durability of various types of cloth can be obtained.

Another feature of the apparatus is that an air blast is directed on to the specimen to maintain it at constant conditions of temperature and humidity.

While the number of rubs to break a cover material in this test is the obvious measurement to make, the report says, this may not be the point at which a book is likely to be discarded. Some may feel that a book is no longer of any use once

it has become 'shabby'—the stage at which the filler has fallen out of a filled cloth, a threadbare appearance developed on a close-weave calendered cloth or when a coated cloth loses its coating. In leatherbound books, the shabby stage is reached when the surface layer bearing the finish is removed.

As far as coating material is concerned, the test reproduces this effect by means of illuminating the under-side of the test strip with a special lighting arrangement. The report states that this technique works reasonably well for deciding the 'shabby' stage in uncoated cloths.

For leather, the test relies on periodic observation during the rubbing operation; though not as simple as the direct viewing this procedure has been found to work quite well in practice.

Speaking in Print

(Continued from Page 13)

haven't got." At the other end of the scale you find the printer to whom Old Style No. 2, Cheltenham or Gloucester, and so on still constitute an adequate repertory. In the background is the trade typesetter; and many a print-buyer who is determined to get what he wants in type faces has yet to decide whether it pays better in the long run to seek out the printing house that has had the courage and wit to stock that face—or to say sternly to one of the humbler firms "I must have this face, so you will have to have it trade set." Certainly these specialist composing houses have been instrumental in persuading a number of printers to put in certain classic romans and italics like Bembo and Perpetua, which they may originally have thought "too fine" for any but the most demanding and print-conscious customers.

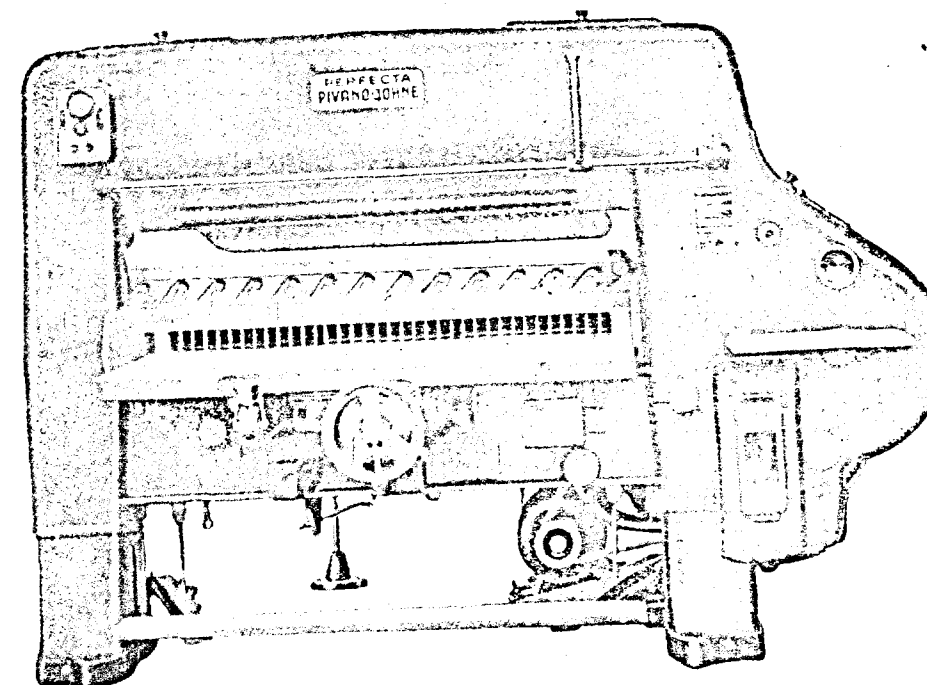
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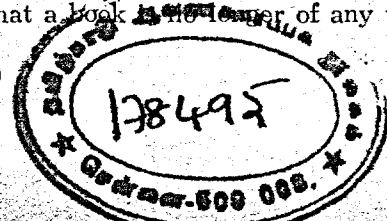
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Speaking in Print

By BEATRICE WARDE

Mrs. Beatrice Warde—Advertising Director of the Monotype Corporation and Editor of Monotype Recorder, one of the world's leading authorities on type faces and author of many works on this subject—offers useful suggestions on choosing and using type to convey a message. We print this article with acknowledgements to the Efficiency Magazine.

NEXT time you have to sit through a succession of badly-delivered after-dinner speeches, by men who know a great deal about their subject but nothing whatever about the subtle art of Elocution, you can turn what might have been an agonising evening into an educative entertainment by trying to translate each speaker's main shortcoming into some equivalent fault which you will have to guard against when you are next "speaking in print"—that is, choosing and using type to convey a message.

Speaker A, for instance, is under the impression that his remarks are audible to the people at the far end of the room, in that what he is saying can be followed by a person blessed with acute hearing, if he is cupping his ears and listening with bated breath—listening, in fact, with just that determination-to-hear which Mr. A would be exhibiting himself, if he could be a member of his own audience.

In reading your own printed matter, describing a product which you know to be so good and valuable, you are, in fact, a member of your own audience. You know that stuff is interesting: so it is the hardest thing in the world to put yourself into the shoes of a man who is not a bit interested in what you have to say, and whose eyes automatically slide away from any type matter that is so small and close packed as to demand a deliberate concentration of attention to

get the sense out of it. What psychologists call the "threshold" of audibility or of legibility is that point at which a deeply interested and predisposed person, with normal faculties, can make out the message. The lesson to be learned is: always choose your reading type one size larger than that which you yourself would consider adequate for legibility.

When Speaker B rose to his feet, the loudspeaker system had been repaired, so you heard every word. Or at least, you heard every sound that he made, in that gallant attempt to gabble out an eight-minute address in the strict five minutes allotted to him. If only someone had told him that an effective pause is worth two breathless sentences! White space, in typography, is the pause, the reader's chance to catch breath. How much channel of white space is there between one line and the next? Is it enough to assure the reader subconsciously that he is not going to read the same long line twice by accident? If it is a face with relative long ascenders (k, l, b, d) and descenders (g, j, p, q, y), the space allowed on the body of the type for those extruding strokes will mean that the middle part of the letter, which carries most of the lower case characters, will be relatively small: a "short descender" 10 point may have a greater legibility factor than a long-descender 11 point. But in any line of more than eight

words a long-descender face is more efficient, because it naturally leaves that channel of white space between the lines which used to be deliberately added by leading in the case of a short-descender face.

Speaker C may have roared at you as tediously as does a page set in an over-emphatic coarsely bold type face; D's grating, mechanical tones may remind you of the effect of a whole paragraph of continuous reading matter set in a sterile and optically inefficient type; Speaker E may have a most melodious voice, marred by certain mannerisms and pronunciations which distract you by that "preciousness," just as some type faces which seem in the type book to have obvious "charm" of design, turn out to be far too distracting for continuous reading.

Or perhaps the acoustics were working on the speakers' voices as the paper and process do on a type face. Garamond and Caslon, and many other thin cut designs in the old face category, look wrong on coated paper: they were designed to be printed on damp, hand made paper with the heavy impression of the old hand press. A few faces like Bembo and Times New Roman preserve their character on almost any paper surface; Plantin 110 is the safest choice of all for coated paper.

By and large, you can grade the intelligence and prestige of a printing office by the contents of its type book as accurately as you can from the intelligence and scrupulosity of its proof-reading. From internationally famous houses like the Curwen Press you expect the use of the finest classic faces, that "the others

(Continued on Page 10)

DISPLAY TYPE FACES

MANY Printing Offices carry quite a number of different founts of type... certainly many will have the more popular faces, such as: Gill Sans, Rockwell, Plantin, Bodoni, Garamond, Perpetua, or Times Roman. How many of these Offices have a complete range of any one of these faces? Before the war there was a tendency to buy one or two sizes of a particular type face to get work, especially from Agencies. To-day, it is not sound economic policy to carry large stocks of display types or large numbers of composition mats for a great number of founts. Far better to concentrate on building up a complete range of a few well chosen faces, from 5-point right up to the largest display size normally asked

for... get the Bold (and the Extra Bold if there is one) and do not forget the Italics and Condensed if these are available in the fount chosen.

You now have the ingredients for successful typography—apply the skill which comes through intelligent guidance and much practice, and you will be able to make the plainest of plain type faces speak volumes for your customers' goods.

Remember there are faces which print best on Coated papers—just as there are those which prefer the softness of an Uncoated surface. You will soon get to know which fount to choose. Before deciding the type face for the job, first ask: on what kind of paper will the job be printed?—From an advt. of Alex. Cowan & Sons Ltd.

IPEX NEWS

HEIDELBERGS AT THE I P E X

INDIAN visitors to the Tenth International Printing Machinery and Allied Trades' Exhibition (IPEX) scheduled to be held at Olympia, London, from the 5th to the 16th July 1955, will be pleased to learn that among the exhibitors will be the well-known West German printing machinery manufacturers, Schnellpressenfabrik A. G. Heidelberg. In all a total of ten Original Heidelberg printing presses—five 10"×15" and two 12"×18" platens and three 21"×28" Cylinders will be on display and demonstrations will be held during the entire period of the fair. One stand will be devoted to the exhibition of an anniversary machine mounted on a turntable. This will be the 7,500th Heidelberg printing press due for delivery to Great Britain at the time of the Exhibition.

Among the team of experts who will be present to offer information and guidance to visitors will also be the German manufacturers' expert printer, Herr Jakob Beckenbach, who will be visiting Britain specially for the occasion.

Another familiar exhibit to visitors from India will be the Polar range cutting machines, also of West German origin.

The East Asiatic Co. (India) Ltd., who represent both the *Original Heidelberg* and *Polar* interests in India have made special arrangements with British Agents to take care of Indian visitors to the Fair and one of the East Asiatic Company Executives, Mr. H. A. Sommer, will be in Britain throughout the period.

Every inch of space at Olympia, covering nearly 500,000 sq. feet, will be in use. Although there will be thousands of exhibits, covering the whole of the printing machinery and allied trades, all these will be under one roof, compact and easily accessible.

Thousands of oversea visitors are expected, for, in addition to a special list of attractions in London, there will be close by, at Earls Court, the exhibition of the British instrument industries. This will feature all the different types of instruments so important in achieving precision in print.

A large number of British technical developments, some quite revolutionary, will be shown for the first time. In lithography and rotogravure there will be such remarkable developments as deep-etch process employing P.V.C. and other plastics, hydraulic graining machines and improved cleaning-down systems.

Conveyor stoving ovens and automatic oven unloaders are examples of recent advances in tinsplate printing by offset-litho that will be of special interest to the packaging industry.

Guillotines have come into line with the modern scientific conception of accuracy. There will be pushbutton-controlled models entirely free of manually operated levers, so exact that they are capable of sizing bank notes automatically.

Electronic engineering, in which British scientists have always had a leading place, is making vital contribution to printing practice. New applications of electronic principles to control gears, precision engineering, slitting, reeling and box-making promise to be among the features of the exhibition.

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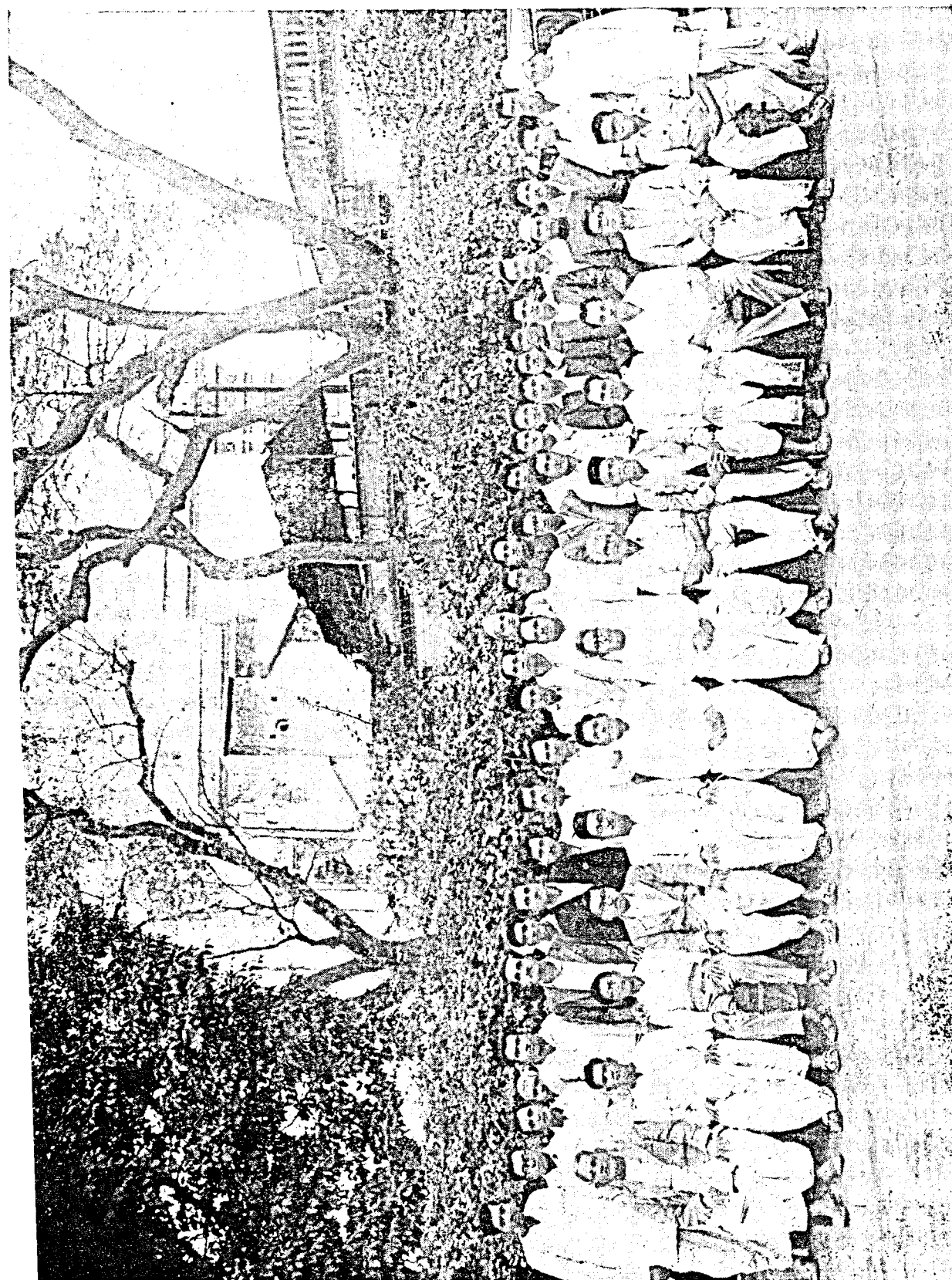


Photo taken on the occasion of the party given by the Hyderabad State Printers Association to Sri T. S. Shummugasundaram, B.Sc. Partner of M/s. Swadesi Type Foundry when he visited the State recently

MASTER PRINTERS' ASSOCIATION FORMED FOR COIMBATORE & NILGIRIS

AN urgent meeting of the Printers of Coimbatore and Nilgiris Districts was convened by Sri S. Ramaswami, Managing Partner, Kalaivani Press, Coimbatore on the 5th April, 1955 to form the Master Printers' Association of Coimbatore and Nilgiris Districts. This was inaugurated by Sri S. Viswanathan, B.A., President of the All-India Federation of Master Printers, under the presidentship of Sri P. R. Ramakrishna, M.Sc. (M.I.T.).

There was a large gathering of members and all presses in the Districts of Coimbatore and Nilgiris were represented.

Sri S. Viswanathan, spoke at length about the objects of the All-India Federation of Master Printers' Association besides emphasizing the need for unity among printers, the advantages of having a Federation fully represented to voice the need of the printers of this country for the advancement of the trade in particular.

The following office-bearers have been elected:

President: Sri P. R. Ramakrishna, M.Sc. (M.I.T.), The Nava India; *Vice-President:* Sri S. Beemaiah Chettiar, The Modern Press; *Hony. Secretary:* Sri S. Ramaswami, The Kalaivani Press; *Joint Secretary:* Sri A. Subramaniam, The Coimbatore Co-operative Printing Works Ltd.; *Treasurer:* Sri R. Pasupathy Mudaliar, K.R.V. & Co.

Committee Members: Sri C. Narayanaswamy Naidu, The Workman Press; Sri N. Krishnaswamy Naidu, The Kammavar Achukkudam Ltd.; Sri Nalluswamy Gounder, The Velala Press Ltd.; Sri K.

Rangaswamy Gounder, The Bharathy Press; Sri Rajamuthu Chettiar, The Raja Printing and Publishing Works; Sri Sadasivam Chettiar, Sri Laxmi Vilas Press; Sri C. A. Bhody, The Staff College Press.

THE HYDERABAD STATE PRINTERS' ASSOCIATION

THE Hyderabad State Printers' Association meeting was held recently and the following were elected to the General Body of the All-India Federation of Master Printers.

Sri J. K. Pranesacharya, Sadhana Printery; Sri P. Nagan, Osmania Printing Works; Sri J. R. Bardapurkar, Jai Hind Press; Sri G. Narayan Rao, Laxmi Art Press; Sri Narayanaswami, Ajanta Art Press; Sri R. Anna Rao, Shyam Printing Press; Sri C. S. Siddhanti, Tarani Press; Sri C. Appa Rao, Praja Printing Press; Sri Puli Mallikarjun, Mulki Press.

The following were elected to the Governing Council of the All-India Federation of Master Printers:

Sri J. K. Pranesacharya, Sadhana Printery, Sri P. Nagan, Osmania Printing Works, Sri J. R. Bardapurkar, Jai Hind Press, and Sri Puli Mallikarjun, Mulki Press.

Manufactures & Agents of Printing machinery, equipment and material are invited to use the pages of *Printech* for the publication of particulars of their new products or new arrivals in India. Make your products better known to all printers of importance. *PRINTECH* reaches every discriminating printer in India. (Blocks: 85 to 100 screen should be sent of the products are to be illustrated).

MODERN PRINTING INKS

By E. RASQUINHA

Chief Chemist, Rainbow Ink & Varnish Mfg. Co. Ltd.

EVER since the printing was realised to be the most powerful means of propagating knowledge and new ideas, better and faster printing machines as well as new printing processes have been devised so much so from the simple mixture of soot in oil which was the first printing ink, the modern printing inks evolved which are a complex mixture of natural and synthetic compounds. The necessity of producing inks of diverse qualities depending on the process of printing, the machine printing 40,000 copies per hour; surface forced the chemist to enter into the field and today it is done scientifically. Modern inks are 'tailor-made': the ink may be required for a slow hand-fed machine run at a speed of 1,000 impressions per hour, or for a high speed rotary machine printing 40,000 copies per hour, it may be required to dry in eight hours or within a fraction of a second or it may be required to print on paper, board, cloth, plastics, metal sheets or foils, rubber, wood, glass or ceramics.

Printing inks essentially consist of solid particles finely dispersed in a medium. The solid materials consist of colouring matter which may be dyes or pigments, and extenders which are almost transparent. Aluminium hydroxide, calcium carbonate, china clay, blanc fixe (Barium Sulphate) are the important extenders used. These are used, in conjunction with appropriate pigments to give proper working properties and to adjust the cost of the ink.

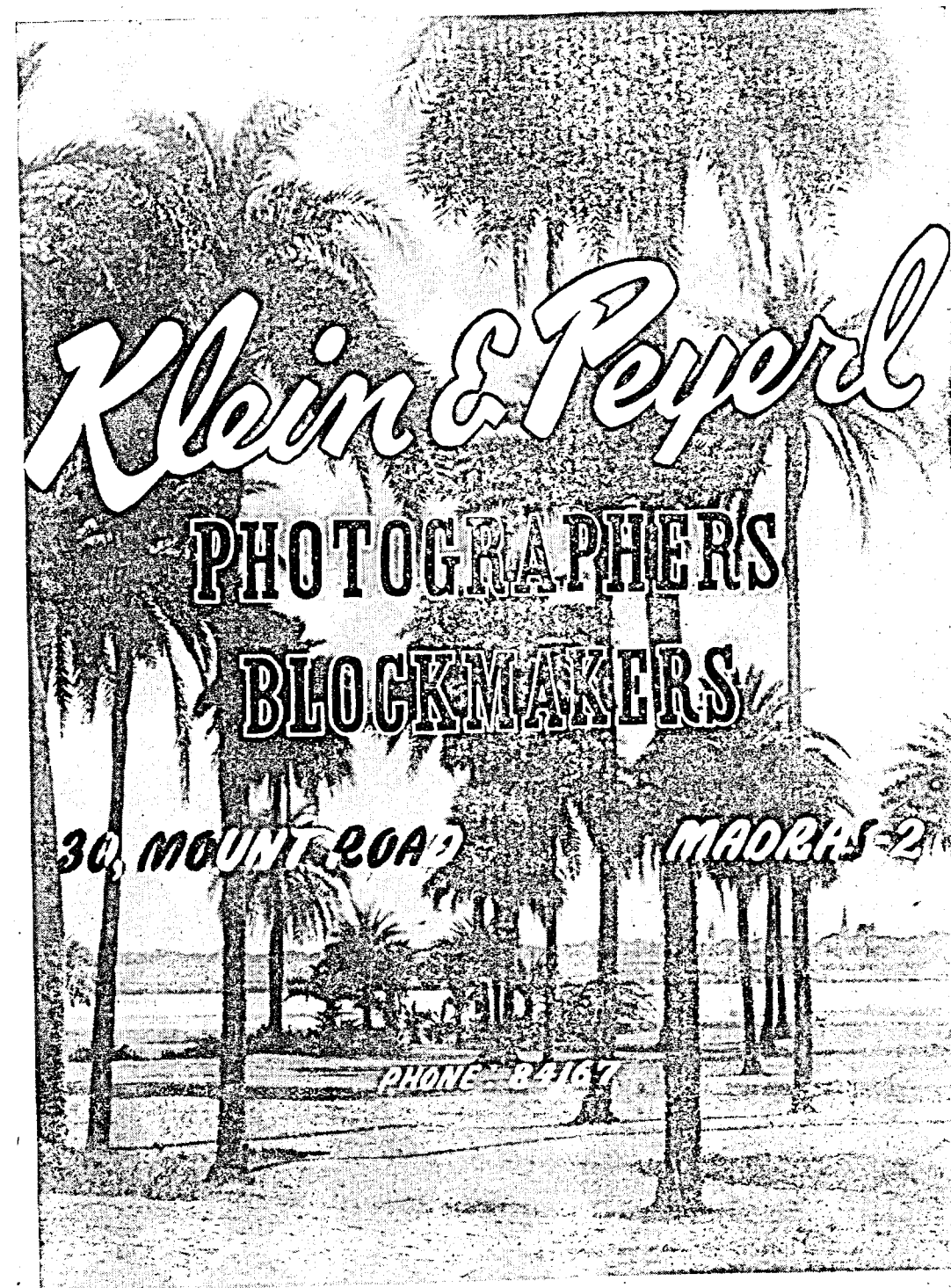
A wide range of dyes and pigments are

THE
AUTHOR



used to colour the ink which may be organic or inorganic. The most important inorganic pigments are lead and molybdate chromes, iron blues (Iron Ferri-cyanide complexes) copper phthalocyanine blues, zinc and titanium oxides. Organic pigments are made by treating dyes with reagents to convert them into pigments. Among these lake pigments, pigment toners, pigment dye-stuffs and Fanal Toners (Phospho-molybdo-tungstic acid dye complexes) are the most important. The pigments are chosen considering their colour strength, covering power and dispersing properties as well as the cost. Whatever pigments and extenders are chosen one important property to be considered is the fineness of its particle size, i.e., it must be able to be dispersed to a fine state in the medium.

The medium is liquid portion of the ink and consists of varnish, driers, solvents and compounds. The varnishes are made with drying oils such as linseed oil, (dehydrated) castor oil, tung oil or non-drying mineral oils by polymerising them and or by combining with natural or synthetic resins. Suitable resins are chosen to give properties like rapid dry-



ing, gloss scratch proofness, adhesions, etc. Driers are metallic salts of linoleic or naphthenic acids. Cobalt, manganese, lead and zinc are the common metals used. The quantity of the drier required is mainly controlled by the nature of the varnish, the oil and the resin used, and to a small extent by the pigments. Compounds may contain various kinds of waxes, starches and wetting agents and are added to give specific working properties to the ink.

Solvents are not added to all kinds of inks. Usually they are used for gravure and (flexographic) aniline inks. These may be of petroleum or coal tar origin or may be alcohol and ethers. The solvents are blended to give proper evaporation rate, solubility to resins and to adjust the cost.

The above delineates the general requirements of raw materials for making modern printing inks but proper selection is necessary for particular ink depending on the process of printing; the speed of the machine, the nature of the printing surface, i.e., paper, and the kind of finish required whether matt, glossy, scuff-proof, quick drying, etc., etc.

Typographic and lithographic inks are made fundamentally in the same manner. The varnishes are made with polymerised (thickened) linseed oil with or without incorporating synthetic resins. The latter are used to a great extent for offset-lithographic inks. The pigments used are also similar but for lithographic inks, pigments must be used in higher concentrations and must not be effected by water. Letterpress as well as litho inks must be long, and tacky, have a good flow, while offset inks must be soft and short with a buttery body.

Inks for gravure and aniline are made

by dispersing dyes, pigments and extenders in a varnish consisting of natural or synthetic resins dissolved in suitable solvent or solvent combination. The resin gives the flow to the ink as well as, acts as a binding agent. The solvents are chosen considering the evaporation rate, toxicity, power to dissolve resins and the cost. For aniline ink, only alcohol (denatured spirit) is used while for gravure inks any solvent, petroleum, coal tar, alcohols or ethers could be used.

Whatever may be the process of printing the inks must be adjusted for the speed of the machine. As the speed increases a lot of problems prop up: ink flying, distribution on the rollers, offset of the print, etc. So the ink medium should be such it gives soft freely flowing ink with little tack, quick setting and with anti-offset compounds. To make the ink suitable for printing on different surfaces, as well as to give different finishes, such as glossy, scuff-proofs and quick drying use of various synthetic resins is made. Each synthetic resin has its own special use; thus long oil alkyd resins are eminently suitable for offset inks as they give scum resisting and easy working inks, while for gloss ink, hard and high melting phenolic or maleic resins coupled with oils are used. So also for quick setting inks and to give good adhesion to plastic, etc., short-oil alkyds combined with phenolics should be incorporated in the medium.

One of the most important factors the formulator has to bear in mind is the mode by which the inks must dry. Some inks dry by absorption alone, news inks or inks used on highly absorbent stock. These inks are made with non-drying oils which penetrate the stock instantaneously as ink touches the paper leaving a thin

layer of pigment on the surface. Letterpress and lithographic inks dry by absorption and oxidation. As the ink touches the paper surface most of the thinner constituents of the medium penetrate the paper, this absorption is completed within an hour and the ink is said to have 'set' now. Then the drying oil in the medium starts absorbing oxygen (catalysed by the driers) and polymerises, i.e., becomes thicker and thicker and finally turns to a solid film which holds the pigment particles to the paper. The duration of the process of oxidation is dependent on a number of factors and may range from a couple of hours to a few days; oil, the resin and the driers in the varnish as well as the pigments are the factors, which are within the ink while atmospheric conditions such as humidity and temperature and nature of the fillers in the paper specially their Ph (acidity or alkalinity) are the factors without. Dehydrated castor oil and tung oils are faster drying oils than linseed oil. For all varnishes there is an optimum of drier concentration and as a rule the resins increase the drying rate. Chromes, iron and phthalocyanine blues accelerate the drying to some extent.

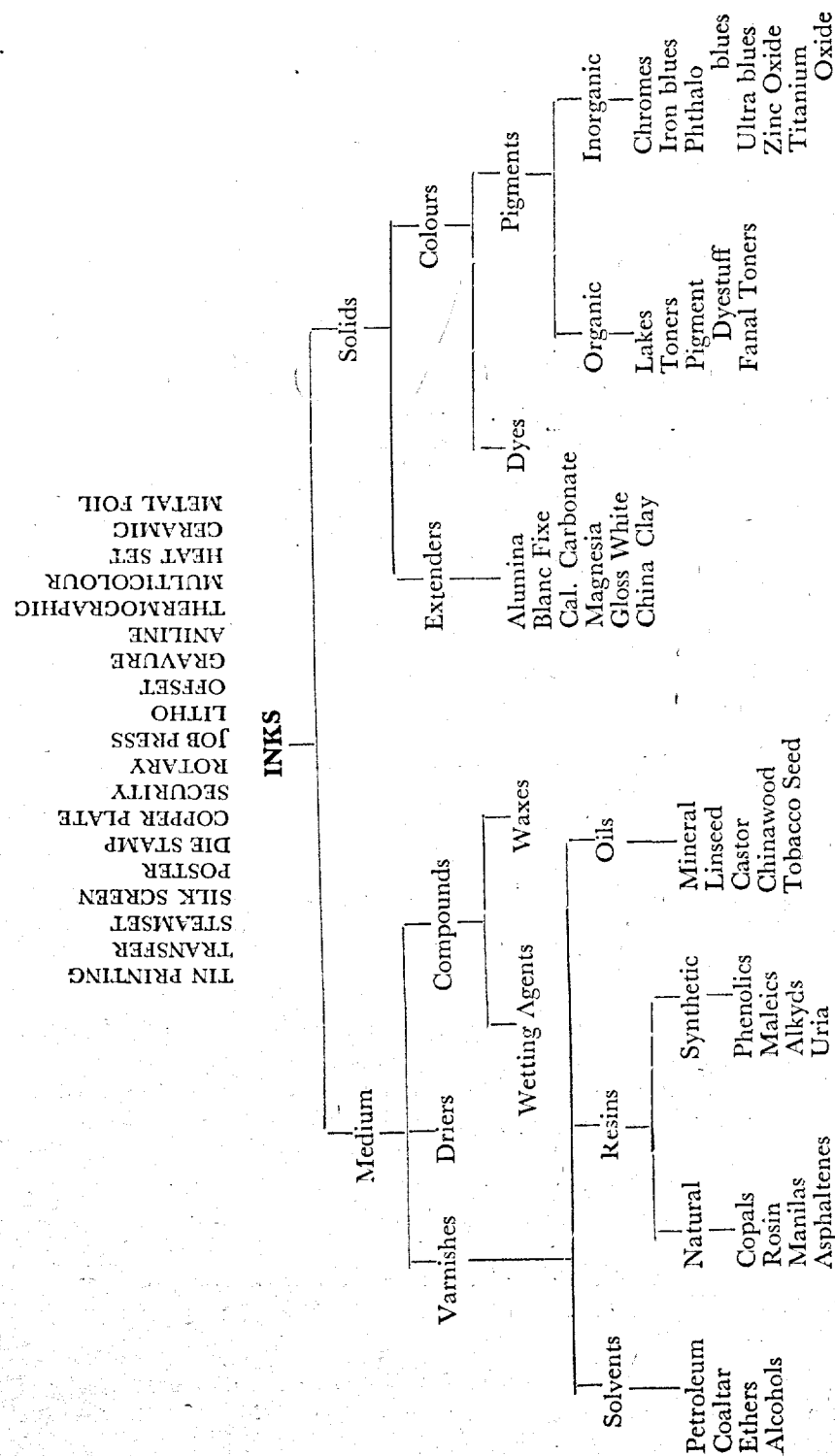
On the other hand mixing of the mineral oils, extenders like alumina most of the fanal toners and some of the black pigments retard drying. Lower the atmospheric temperature and higher the humidity slower is the drying rate. Acidity (Ph_4) in the paper retards drying but this becomes very powerful as the humidity increases and situations may occur when the ink may never dry for weeks even with large quantities of drier. This happens often with lithographers in the rainy season. The humidity already is high and as paper picks up moisture from

the printing plate, which due to evaporation in between the piled up sheets increases it considerably and if the paper is acidic the ink may never dry.

Gravure and aniline inks dry by evaporation or by evaporation and absorption. In these inks no oils are used but only solid resins and when the solvent goes off a thin film of the resin is left which binds the pigments. Silk screen inks dry by evaporation, oxidation and absorption.

In addition there are other novel methods of drying such as heat, steam or moisture set, wax set, quick or pressure set inks. The name itself suggests the method by which hardening of the medium is effected. As soon as the printing is done it is treated with heat, steam or wax, then due to definite chemical reactions the medium is hardened instantaneously. Quick set inks have medium consisting heavy (almost solid) varnish dispersed in a thin oil. As soon as these inks are printed preferential absorption of the thin varnish take place leaving the thick varnish with pigments and extenders on the surface. This kind of inks require coating on the stock like art and chrome papers to give good performance.

Some of these new kinds of inks were not even heard of a decade ago, it shows the ink making is still evolving; rather the recent developments are almost revolutionary: a host of new synthetic resins, plastics, dyes and pigments are offered to the ink technologist, most of which hardly have been explored. On the other hand rapid changes are taking place in the printing processes, machine designs and paper surfaces which will necessitate new development in inks so much so it is not possible to predict what the ink making of tomorrow will be.

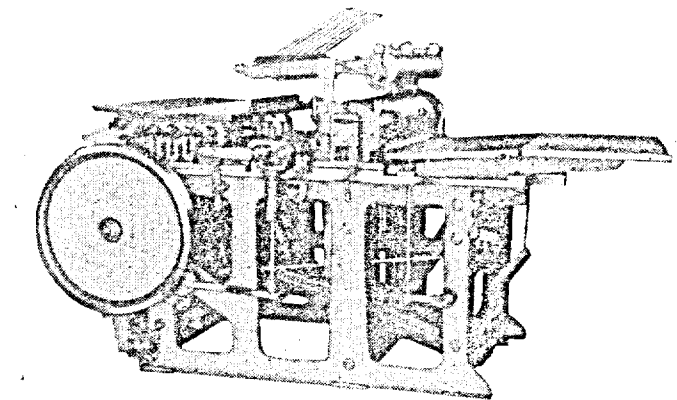


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MARGINATOR

NEW WAY OF PRINTING AND
ETCHING PROCESS BLOCKS

CLAIMED as a new way of printing and etching process blocks is the Cliche-Oslo method, originated by Jens Aanesen of Oslo. The process applies mainly to line blocks and line-and-tone combinations. For this a special machine is used called a "Marginator." Sole agents in Great Britain for this machine are the S. D. Syndicate, Westminster Bridge House, 121 Westminster Bridge Road, London S.E. 1.

The orthodox way of producing line blocks is to give a first etch, then roll up and deepen in a series of small steps. The new way is to print down the plate on the 'Marginator,' printing a protective image over the original print. This gives a better result, with much less work in the etching department. The plate is coated a second time with another enamel, and is placed on the 'Marginator' with the negative in register. The machine is started and, during exposure, the plate moves slightly with a circular motion, thus enlarging the image to provide the protective edges. The amount of margination can be controlled by a scale in the machine. The plate can now be etched, obtaining the depth required in the first etching, before removing the second print, and finishing off on the first print.

A third print may be made, again in the 'Marginator,' to provide a protective edge outside the second image. By this means, a first deep etch may be made, the

third print removed and a middle etch given. The second print is then removed and the plate finished on the first print. This gives great depth with a minimum of manual work.

Detailed instructions have been prepared for the method and it is stated that any skilled man can work the 'Marginator.' After the second coating (or third) the plate is placed on the table of the machine and held there by vacuum. The negative is placed on top, in register, and held by vacuum bars. The amount required is set on the scale, the arc lamp and machine switched on, and the margination is automatic.

MAIN ADVANTAGES

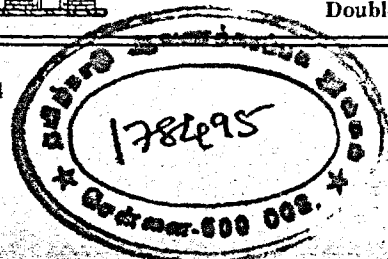
Advantages of the Cliche-Oslo method are that an essential part of the work is moved from the etching department to the printing department, where it is mainly accomplished mechanically on the 'Marginator'; it does away with much manual work and the working is rationalised; it speeds up the line etcher's work and it is claimed that better quality working is obtained and that it saves time and costs.

A leaflet has been prepared on the 'Marginator,' which can be obtained from the S. D. Syndicate. The pioneer of this process in Britain is Fred Thomas of Star Process Engraving, Manchester, who went over to Norway, in the first place, to see the machine, and installed the first one in his works.

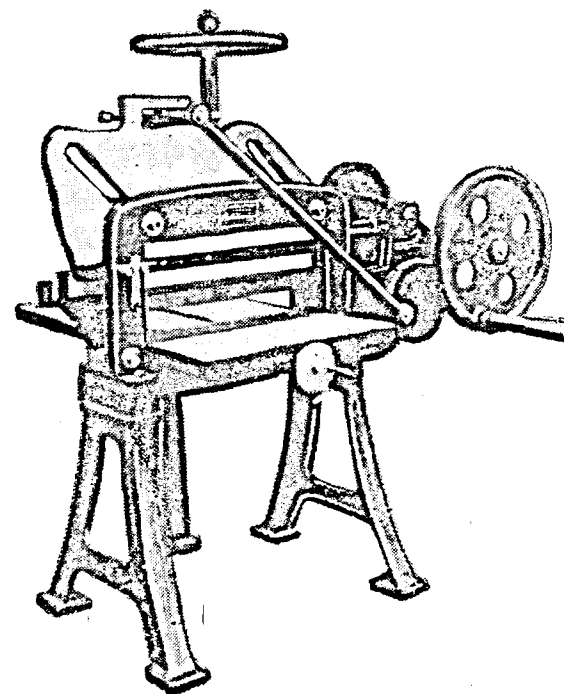
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