A SHORT INTRODUCTION TO PRINTING ON POSTAGE STAMPS

PART I

INTRODUCTION

Paging through the Gibbons Catalogues you will find at least fifteen different ways in which postage stamps have been printed. This takes no account of technical differences introduced by individual printers. Most have their own pet ways of doing things and there are probably more secrets than patents in the printing industry.

Printers themselves divide their craft into three parts which they call Preparation, Machining, and Finishing. Preparation begins when the design has been approved and ends when the printing plates are ready for the machine room. Machining is the process of transferring ink to paper. Finishing in printer's language means turning the printed paper into the sheets or coils or booklets of stamps as ordered by the Post Office for sale to the public. It includes perforating, cutting and trimming, sorting, packing, and labelling. It is the printer's last chance to discard faulty material and therefore takes on an importance out of proportion to its cost. In former times it included gumming but it is now general practice to print on ready gummed paper. This paper attempts to deal briefly with Preparation and Machining; Finishing deserves a paper on its own.

The printer knows three process categories which he describes as (1) Printing from raised surfaces: his common name for this is Letterpress but the catalogues prefer Typography, shortened to Typo. (2) Printing from flat surfaces which the printer calls Planographic Printing: it appears in the catalogues as Litho (short for lithography) or as Offset. (3) Printing from sunken surfaces which the printer calls by the general name of Intaglio: described in the catalogues as Line Engraved or Recess or as Photo (short for Photogravure).
The Wood Block

The oldest method of printing is from a raised surface: it was practised in the East for centuries before it reached Europe. The method is known as wood block printing and has remained unaltered since first it became known. A block of hardwood is cut across the grain and planed flat: the design is drawn upon it and the background is chipped away leaving the design standing proud of the surface. The design is then inked and an impression is taken off on paper. Woodblock printing survives as a process for art book illustrations. It was used commercially well into the 19th century. Capt. Milton Stern recently pointed out that the designs of the RSA Zulu War commemoratives were taken from woodblock illustrations which appeared in contemporary issues of the Illustrated London News.

I don't recall any major stamp issue which has been struck from woodblocks but I suspect hand engraved woodblocks were used for several issues of Indian Native States, for example Soruth (1864) Jammu (1866) Faridkot (1876) and possibly for a British Administration issue from Crete (1898). The so-called Cape Triangular "Wood Blocks" produced by Saul Solomon in 1861 were not printed from wood but from metal plates mounted on wood.

Woodblocks have been used world wide as cancellers or obliterator. No maltese cross canceller is known to have survived but informed opinion is to the effect that the bulk supplied on contract to the Post Office was probably cut in brass but the numbered Provincial Town cancellers used from 1845 onwards were issued in two kinds: wood at five pence halfpenny each, and brass at ninepence. The choice depended on the volume of post passing through the office.
PART II
PRINTING FROM RAISED SURFACES

The following methods have been used for printing postage stamps from raised metal surfaces:

(1) Typewriters  (2) Printer's type
(3) Steel plates  (4) Steel plates combined with embossing dies

 Typewriters
An office typewriter was used by Rev E. Millar at Mengo in 1895 to produce stamps for Uganda: an issue of Tonga was surcharged by typewriter in 1896, and an issue of stamps was produced on a typewriter for the British Civil Administration in Long Island in the Aegean Sea in the Gallipoli Campaign in World War I (1916).

 Printer's Type
Some of the world's earliest, most interesting, and most valuable postage stamps were produced from printer's type and what the printer calls "stock ornaments": for example Bermuda (1848) British Guiana (1850) the Hawaii "Missionaries" (1851-52) and the world's rarest, most valuable stamp, the British Guiana of 1856. There are dozens more if we include the semi-official issues which emanated from U.S. cities in the 1850's or from the Confederate States in the 1860's. The main use of printer's type always was, and still is, for the application of overprints or surcharges.

 Steel plates
Typographic printing from steel plates was first used in 1849 to produce stamps for France and Bavaria. The process spread rapidly through the Germanic Countries, Scandinavia, and Eastern Europe. Within ten years the following have been noted:
Steel Plates combined with Embossing Dies

At an early stage in the history of stamp production a type of design which earned widespread approval consisted of a coloured border printed from steel surrounding a central motif consisting of the national coat-of-arms or the royal bust, blind (i.e. colourless) embossed. Designs of this genre were popular in the Germanic countries for about a decade but never won acceptance beyond Central Europe. The first combined printed and embossed design stamps were produced in Frankfurt in 1845 for the Canton of Basle, thereafter:

1850 Schleswig-Holstein
1854 (Sept) Switzerland printed in Munich
1854 (Nov) Switzerland printed in Berne
1855 Sardinia
1857 Wurtemberg
1858 Austria
1861 Prussia

"Seals"

Visually similar to the foregoing, but produced by an entirely different process, were the 1/- octagonal stamps of Great Britain produced at Somerset House in 1847 to be followed by the 10d value a year later. They were produced one at a time by hand by pressing the paper between the steel male and female dies of a hand press intended primarily for affixing revenue seals to documents of value, for authenticating important papers and similar administrative purposes.
It was an impossible way to produce stamps in bulk and history tells us that about one third of the paper was wasted. The same method was used in India to produce the first stamps of the sub-continent, the so-called Scinde Dawk issued in 1852. The method was used once more in Great Britain to produce a 6d value in 1854 and once again in Natal in 1857 to emboss an unprinted coat-of-arms on coloured paper.

At a later date machines were invented which produced seals by continuous process from ready gummed rolls of paper. They were designed to make decorative seals for commercial applications and I do not suppose that anyone thought at the time to use them for postage stamp production. The seals are separated into singles before being ejected from the machine and cannot be supplied in panes as normally required by the Post Office. However a seal machine was pressed into service in an emergency in Prague in November 1918 when the Kolman Printing Works produced an issue of stamps for the Provisional Czech Government in the closing months of World War I. As far as I can trace gummed seals were never again used as postage stamps until the Walsall Lithographic Co. produced the "Gold Coins" issue for Tonga in 1963. This issue was the forerunner of several of a more exotic kind including some which are blind embossed on what claims to be thin precious metal foil. I have, for example, two values perf. and imperf. from Sharjah 1971 which, not surprisingly, do not enjoy catalogue status; they bear the imprint "Schaubmayr Vienna". A 1971 issue of Togo honouring Napoleon and face value 1000f enjoys catalogue status.

**Electrotype plates**

The introduction of electrotype printing plates in the early 1850's is of special significance in stamp production. The use of electricity to do part of the work formerly done by the craftsman's skill marks the beginning of modern technology in the preparation of printing plates. Splendid articles on the making of Great Britain's
electrotype plates appeared in Gibbons Stamp Monthly in 1973 March and August. No doubt library copies can still be obtained if required. In one method of preparation a master die is cut in steel and from this as many lead copies are taken as there are stamps in a pane. The leads are assembled and locked together and placed in an electrolytic bath that deposits a uniform thin skin of copper over the whole surface. This skin is carefully removed and the back filled in with some suitable metal, usually printer's type metal. The back is planed true and the plate is ready for printing. However copper is too soft to stand much wear so that it is usually surface coated with a hard wearing metal such as steel, nickel or chromium. Electrotype plates were first used for printing postage stamps for Tuscany at Florence in 1851, thereafter:

1852 Modena, printed locally
1853 Great Britain Postal Fiscals printed by De La Rue
1854 Danish definitives printed in Copenhagen
1855 Great Britain definitives printed by De La Rue.
1859 Romagna printed in Bologna

**Stereotype Plates**

Stereotyping is a method of duplicating printing plates so that several copies of a master can be printed off simultaneously on one sheet of paper. It was invented by William Ged of Edinburgh about 1739 using plaster of paris as the moulding material but the invention was wrecked by the conservatism of Scottish printers who feared for their livelihood. It was revived with some success by Lord Stanhope at the Clarendon Press, Oxford, about 1805 but really took off some 25 years later when plaster was replaced by papier mâché as the moulding material. So far as I know the one and only issue of postage stamps printed from stereotype plates is the famous Cape triangular "Wood Blocks" printed by Saul Solomon in 1861. The master block was cut in steel by C.J.Roberts, a papier mâché mould was made and the required number of stereo plates cast in type metal. These are much thinner than printer's type and were mounted on wood.
to make them what the printer calls "type high", that is to make a combined wood and metal printing plate that is the exact height of printer's type so that the plates will fit in the bed of a letterpress printing machine designed to take printer's type. The story of the wood blocks is told in detail in the little book Cape Triangular Stamps by Rosenthal & Blum published by Balkema in 1957. The original plates, now defaced, may be seen in the Cultural History Museum in Adderley Street.

Halftone Blocks
From the earliest days of printing the artist and the printer have wrestled with the problem of reproducing light and shade or what the printer and photographer call "continuous tone". Engravers were limited to what could be cut in metal with the burin. The successors to Johan Gutenberg were limited by what could be cut out of a block of wood. In either case they were limited to what could be depicted with a mixture of lines and dots. The earliest illustrated book of any consequence is the so-called Nürnberg Chronicle produced by Anton Koberger in 1494. The South African Library proudly possess a copy of this scarce and famous work. It contains 1809 illustrations taken from 645 separate woodcuts. The delicacy with which the early stamp engravers succeeded in achieving artistic results can be nowhere better illustrated than by studying an enlarged photograph of a ld Black, or by viewing an original specimen under a strong glass. But their best results fell short of reproducing continuous tone. This had to wait for the development of photography and the invention of the cross line screen. The principle of continuous tone printing, whether by letterpress or lithography or photogravure is to photograph the original art work through a screen which breaks up the design into a series of minute dots. The tone effect is then achieved either by dots of different sizes (small for light, larger for dark) or, in the case of conventional gravure, dots of the same size but reproduced from engraved cells of varying depth.
For letterpress or typographic printing the screen does not, as a rule, exceed 150 lines to the inch. This produces a coarse print in which the individual dots can be seen with the naked eye, the sort of print that is familiar to any reader of the black-and-white pages of our daily newspapers. This type of printing is not really satisfactory for postage stamps and has seldom been used, however the catalogues mention the following:

- 1908 Uruguay, stamps printed by a local commercial printer
- 1909-15 Persia (Iran) stamps printed by Enschedé
- 1913 Kishangarh (Indian State) stamps printed locally in the printing department of the Diamond Soap Works.
- 1937 Latvia.

Gibbons says that the 1969 definitives of the Netherlands were printed by Enschedé from halftone blocks; if so they must have developed an entirely new approach to halftone printing for the quality of work is equal to the results which could be obtained by lithography or gravure; however my local technical sources seem to think that these stamps were in fact printed by offset lithography. I have not yet been able to get an authoritative opinion on the precise process used.

Gold Blocking

Gold blocking is a special case of typographical printing from steel or brass dies in which a heat transfer medium is used instead of printer's ink. The medium is heat sensitive and is carried on a film of transparent plastic which is supplied in reels which run between the printing dies and the paper. As the dies, which are heated, strike home the metallic coating is detached from the carrier web and becomes firmly adhered to the paper. Some years ago I presented an illustrated paper on gold blocking of the Great Britain Queen's Heads to this Society. The manuscript is filed in our library and can be borrowed by any interested party. This method of decoration has never been used to produce a whole stamp; it only value has been to add something to a previously printed stamp, for example the Queen's head on the British Christmas
stamps of 1966, the inscription on the twelve-and-a-half cent Bible Society of RSA (1970) and the overprint "World Champions" on the 15c Bowls issue of 1976.

PART III

PRINTING FROM FLAT SURFACES OR PLANOGRAPHIC PRINTING

Postage stamps have been printed by the following "flat" processes: -  
Photography, Lithography, and Offset Lithography. As far as I know photography has been used once, and once only, at the siege of Mafeking to print the "Mafeking Blues" and the £1 siege currency note.

Lithography is based on the well known fact that oil and water don't mix. The process was discovered by Alois (or Aloisius) Senefelder of Munich about 1800 and used commercially by a certain Mr. André who used it at Frankfurt to print music. The process was introduced into England about 1801 by André's son, Mr. P. H. André, a London merchant.

Senefelder's discovery was made possible by the particular qualities of a certain Bavarian limestone. This stone lies in horizontal beds and can be quarried in smooth regular slabs about 10 to 12 cm thick. The stone is slightly absorbent and if damped will retain surface moisture. Senefelder started with a dry smooth slab and drew his design on the surface, reversed right to left, with a greasy ink. He then passed a damp roller over the whole surface of the stone. The greasy portions resisted water and remained dry. The unaltered portions of the stone got damp. Next Senefelder passed an inked roller over the stone using a greasy ink which was compatible with the ink used to draw the design. The result was that the design received a coating of ink whilst the rest of the stone stayed clean but damp. Next a sheet of paper was laid on the stone and an impression taken off either by roller action or by scraper.
The original design could be drawn right on to the stone or could be prepared on transfer paper and afterward mechanically transferred to the stone. The method had obvious advantages over type-set printing for the reproduction of original hand drawn art, autograph letters, music, maps, plans etc. Government Surveyors were amongst the first to recognize the potentialities of the new process and many of their offices were equipped with lithographic presses. Charles Davidson Bell, the famous designer of the Cape Triangular, learned the art of lithography whilst on a visit to Edinburgh in 1847, and brought a press back with him to Cape Town. It is therefore no accident that many early lithographed stamps were produced in Government Survey Offices.

The earliest lithographed stamps (on stone) were produced in 1843 for the Swiss Cantons of Geneva and Zurich; within the next ten years the following appeared:

- 1850 Berne, the first to be lithographed in two colours
- 1850 Victoria, Australia, printed in Melbourne
- 1850 Spain, printed in Madrid
- 1851 Sardinia, printed in Turin
- 1852 Oldenberg, printed locally
- 1852 British Guiana, printed by Waterlow, London
- 1854 Western Australia, printed locally by the Government lithographer
- 1854 India, printed in the Surveyor-General's office, Calcutta.
- 1854 Chile, printed in Santiago.

The Chilean issue is of unusual interest as the same design was produced in three different emissions, first by the recess process in London, second by the recess process, using the London plates, in Santiago, and again by lithography from stone in Santiago using transfers from the recess plates to prepare the stone.
The stones were heavy and the process cumbersome, moreover the supply of suitable stone appeared even then to be limited. Even a medium size stone might weigh 100 kg or more. In my young days a lithographer could be recognized by the muscular development of his biceps. In time zinc and aluminium plates were used in place of stone. To emulate the absorbent quality of the stone the surface of the metal plates was mechanically grained. These plates were flexible and could be curved so that they could be attached to the surface of a printing machine cylinder. This led in due time to the introduction of rotary lithographic printing with considerable increase in the rate of printing, but no change of principle.

Offset lithography was patented in England in 1875 as a tin printing process by two business partners, Robert Barclay and John Fry, trading in Southwark as Barclay & Fry. They were members of well known Quaker families, Barclay of Barclay's Bank and Fry of Fry's Chocolate. For some unknown reason they sold the patent rights to Bryant & May, the match manufacturers, and they in turn licensed the process to Huntley, Boorne & Stevens, an old established firm of tin box makers, of Reading in Berkshire, home of Huntley & Palmers, the biscuit makers, with whom H.B. & S. had both business and family connections. Barclay summarised the offset principle as "the use of an impression cylinder receiving the impressions and transferring them by set-off to the metal". For some obscure reason nobody seems to have thought of using offset lithography on paper until the early years of the twentieth century. This adaptation is credited to a certain Ira W. Rubel about 1906. Offset lithography produces better printing results with fewer colours on cheaper papers and in course of time has virtually driven direct lithography off the market.

The term photo-lithography refers to a method of preparing lithographic printing plates, and not to a method of printing. As mentioned above the stones could be prepared either by hand or by transfer. The earliest attempts at photo-lithography also used transfer paper.
The paper was coated with bichromated gelatine, exposed to light under a negative, inked with transfer ink, and then developed by soaking and sponging in water. The ink adhered firmly to those parts of the gelatine which had been hardened by exposure to light but was washed away from the unaltered parts. The resulting photographic transfer was then laid on the plate and transferred mechanically. In more recent times the lithographic plate itself is coated with a light sensitive emulsion (The printer calls them pre-sensitized plates) and is directly exposed to the light source with the photographic film held in perfect total contact with the plate in a vacuum frame. A photo-litho plate can be printed either by direct or by offset lithography but the former is rarely used now-a-days.

Offset lithography was first used to produce postage stamps by Bavaria at Munich in 1911. German high values followed in 1920, then the "carrier pigeon" issue of the Netherlands printed by Enschedé of Haarlem in 1924. 1925 saw the issue of the first Union of South Africa air-mails, printed by the Cape Times Limited, and the Egyptian Geographical Congress commemoratives.

The photographic and technical refinements that led to the widespread use of four-colour photo-litho-offset printing to produce multicoloured postage stamps had to wait until the world had recovered from World War II. Collectors will know that progress in this direction has been little short of phenomenal since the 1960's with countries around the world vying with each other producing colourful designs to catch the collector's cash.

The principles of four colour reproduction using the three primary colours plus black have often been explained and are no doubt well known to collectors but a short description may not be out of place. The "colour wheel" is an essential sales tool in every paint shop or dealer in artist's colours. It is a visual reminder that any desired
colour can be made up by suitably blending two or more of the primary colours, red, yellow, and blue. The printer's standard terminology for the special inks he uses to reproduce the primary colours is "magenta, yellow, and cyan blue". The original design can be a work of art, a colour photograph, a hand-drawn design, or a montage made up of elements of all three. It is photographed four times, each time through a fine cross line screen which in effect reduces the design to a series of fine dots. The standard screen for fine colour work has 300 lines to the inch giving the staggering total of 90,000 dots to the square inch. This is too small to be separated by the naked eye and a print in greyish black from such a screened print would appear to be in continuous tone. To prepare the black printing plate the design is photographed with screen but without filter. To get the red plate we have to filter out the yellow and blue in the design; this is done by photographing the design through a green (blue plus yellow) filter. Similarly the yellow plate is obtained by the use of a purple (blue plus red) filter, and the blue plate by the use of an orange (red plus yellow) filter. So that the dot patterns will not be printed precisely on top of one another the screen is rotated so many degrees between each exposure. A four-colour process print, when examined under a powerful glass, appears as a continuous series of interlocking hexagons. An easy way to study this method of producing multi-colour designs from the primary colours is to take a close look at the screen of your colour television set. The separate colour dots are easily big enough to be seen and recognized by the naked eye. It is only when you view the picture from a convenient distance that the dots appear to merge into a continuous natural colour pattern.

Before ending this section there is one freak issue of lithographed stamps (if we can call them that) which was issued by one of the Arab Emirates for the 12th World Scout Jamboree in 1971. The print is plastic coated to give a three-dimensional effect. Maybe o.k. as an advertising gimmick but hardly surprising that they do not enjoy catalogue status.
PART IV
PRINTING FROM RECESSED OR SUNKEN SURFACES

Intaglio printing comprises top processes, or groups of processes, which seem at first sight to have little in common except that both print from engraved or recessed surfaces. They are line engraved or recess printing and photogravure printing, sometimes called rotogravure which is an American contraction of rotary photogravure.

Printing from hand engraved plates or from etched plates has a long and honourable history and has bequeathed to posterity some of the finest works of art of medieval times, but the use of recess printing for the production of postage stamps was only possible because at the time that the Post Office became interested there was a unique combination of craft and mechanical skills available in the London firm of Perkins, Bacon & Petch. They already had experience of printing, bank notes and they were now ready to turn their hand to the production of postage stamps. The stamp was, as every philatelist knows, the Penny Black which was released to the public on 6th May 1840. The process used by Perkins, Bacon & Co was in essentials the same as is used to print recess or line engraved stamps right up to the present day. In retrospect it can be said that they were streets ahead of their time.

There is a copious literature on the subject and I would refer the interested collector to the splendid illustrated article which appeared in Gibbons Stamp Monthly for May 1980, pages 117-119, written by Mr. J.V. Woolford of East London who is also a member of our Society.

In the last few years line engraving has received a new and extended lease of life as part of a multi-colour combination of processes in which the facility for printing clean fine line by steel engraving is combined with tone colour work either by offset litho or photogravure. To my mind the most imaginative and aesthetically pleasing combination
has been made by Canada with their Canadian Ships (First Series recess and photogravure 1975, Second Series recess and offset 1976) and their City Streets designs issued as part of a definitive set in 1978. Another splendid example is their Capex 78 issue depicting a facsimile reproduction of a line engraved stamp of early Canada (1851) superimposed on a photogravure background and inscription. A crazy effort by the U.S.A. in eight or nine colours may be a tour de force in the technical sense but was less than satisfying as a work of art. Switzerland, whose stamps are generally of an exceptionally high standard, has also produced combined recess/colour work which can scarcely be called exciting. The first ten years of postage stamp production included the following line engraved or recess printed issues, all I think on steel except the Mauritius which were hand engraved on copper.

1840 Great Britain, printed in London
1843 Brazil "Bull's eyes" printed in Rio
1845 U.S. "Postmasters" issues from New York & St. Louis
1847 Mauritius "Post Office" issue
1848 Mauritius "Post Paid" issue
1849 Belgium "Epaulettes" printed in Brussels
1850 New South Wales "Sydney Harbour" printed in Sydney
1850 Prussia, King William Frederick IV, printed at the State Printing Works, Berlin.

Rotary photogravure makes use of the principle of surface tension in free flowing liquids. Place some liquid in an open bowl and tilt the bowl and the liquid will freely run out, but place the liquid in a very small bore tube sealed at one end and turn it upside down - and the liquid will flow out slowly or not at all. By means of photography through a cross line screen the design to be printed is reduced to a pattern of minute squares as previously described. The design is transferred either directly to the sensitized surface of a copper cylinder, or indirectly by means of a "carbon tissue" transfer, and the surface is etched into a pattern of minute cells of varying depth.
The depth determines the amount of ink picked up by each cell, and this in turn determines the density of colour printed on the paper, a shallow covering of ink in the lighter parts of the design and a heavier coverage where darker tones are required. In the printing process the engraved copper cylinder is usually given a coating of chromium to provide a longer lasting working surface. When mounted in the printing machine it is first flooded with free flowing liquid ink all over its surface; the surface is then wiped clean with a flexible steel "doctor blade".

The engraved cells then fulfil two functions: the cells hold ink whilst the walls of the cells form a bearing surface for the doctor blade and prevent it from wiping ink out of the cells. At this point in the cycle of events the cylinder is revolving with the design inked but the remainder of the surface wiped clean. The impression is then taken off by pressing a continuous web of paper against the printing cylinder by means of a resilient rubber impression roller.

The invention of photogravure printing is credited to a certain Karl Klic or Klietsch, a native of that part of the Austrian Empire which is now known as Czecho-slovakia. He conceived the idea of etching the images on a copper roller and then printing in the manner that was current in textile and wall paper factories using continuous webs of paper in place of sheets. The process was first worked commercially as a secret process by the Rembrandt Intaglio Printing Co. at Lancaster in Northern England beginning about 1894. It was not used for postage stamps until the 1920's when experimental work was done in Munich, Paris, London, and Haarlem. Although not one of the earliest the company which will always be associated in my mind with the finest development of gravure printing for stamp production is the House of Courvoisier in Switzerland. They had two factors working in their favour. The size of the Post Office sheets of stamps standard in Switzerland is much smaller than is customary elsewhere and it is easier to maintain consistency and accuracy on a small sheet than on a large one. And in the second place Switzerland was neutral in World War II and could continue its technical progress whilst others were more concerned with guns.
Courvoisier produced their first one colour gravure stamp for Switzerland in 1932; a two-colour design appeared the following year, and in the "butterflies" design of 1950 they produced what I personally regard as the highest standard of artistic and technical excellence achieved anywhere in the world up to that time. I do not think it is an exaggeration to say that this marks a new departure in postage stamp production and a desire to emulate the Swiss was a factor in the subsequent world wide movement toward pictorial stamp design. I doubt whether Courvoisier themselves ever bettered this standard, indeed in my view their standard of design never again reached the height of delicacy of 1950.

The first ten years of photogravure stamp production included the following issues: -

1922 Rumania, printed in Munich
1922 French Morocco, printed in Paris
1923 Egypt, printed by Harrison
1924 Holland, printed by Enschedé
1925 Russia, printed locally
1925 Lebanon & Saar, printed in Paris
1926 Egypt, printed in Cairo
1927 Rumania, printed in Paris
1928 Rumania, printed in Bucharest
1931 Union of South Africa, printed in Pretoria
1932 Hungary, printed in Budapest
1932 Belgium, printed at Malines
1932 Switzerland, printed by Courvoisier.

PART V
CONCLUSION

There remains the acid question, does Mr. Average Philatelist need a working knowledge of printing for the enjoyment of his hobby?
For myself I am bound to answer with an unqualified "yes". Any knowledge that must add to the enjoyment of one's hobby must surely be welcome, but more than that, philately today cannot be pursued in more than a perfunctory way without an appreciation of the whys and wherefores of stamp production. There are many ways in which increased knowledge will help; we shall briefly examine three of them: A knowledge of printing and printing processes will help in:

(1) identifying stamps of the same design, printed by the same process, but using different technical procedures.

(2) identifying stamps of the same design printed by the same process, but by different printers, and

(3) identifying stamps of the same design produced by different processes whether by the same or different printers.

As an example of the first let us look at the German "post horn" definitives produced in 1922 - 1923 which were printed by typography from both flat and curved plates or the "Washington's head" of the U.S.A. which were printed in 1908 - 1910 from both flat and curved recess steel plates. We start with a flat steel plate perhaps 5 mm thick and print from it. The size of impression will automatically fix the size of the stamp. For rotary printing the plate will be curved into a half-circle (there is an illustration of both a flat and a curved U.S. plate on the boards) for attachment to the printing machine cylinder. Now it is a mathematical certainty that a plate 5 mm thick curved into a half circle will stretch by 15 mm in the direction of curvature. At the same time there will be a slight but measurable shrinkage across the width since the total volume of metal will not change. If there are (say) 20 rows of stamps on the plate each impression will stretch by about three quarters of a mm., not much to be sure, but sufficient to be measured with a steel rule and a pair of dividers. At the same time a slight but visible reduction in width will take place. Given a fair amount of material so that "freaks" can be eliminated examples of each type can be identified beyond doubt and correctly described in your collection.
A classic example of the second problem area is to be found in the "Castles" high values of Great Britain Q.E.II issued between 1955 and 1968. The same plates were used by Waterlow, De La Rue, and Bradbury Wilkinson. There are of course some features other than printing to help in a determination of who printed which, watermark, size of perforations and so on, but the 10/- and £1 values are displayed side by side on the boards to show how "different" the "same" stamps can look. With study and experience it should be possible to assign single stamps in clean condition to the source.

For South African collectors there are two classic areas in which the ability to identify the work of different printers is a "must". The Cape Triangulars were printed from the same plates first by Perkins Bacon & Co. and later by De La Rue, and, nearer our own times the halfpenny, penny, and sixpence definitives of the Union first issued in 1926 were printed from the same plates by Waterlow in England and by the Government Printer in Pretoria.

One example has already been mentioned which combines elements of both the second and third problem areas, the earliest stamps of Chile. The identical stamp design was produced by recess in London, then by recess from the same plates in Santiago, and again by lithography in Santiago using transfers from the recess plates. Other examples of the third category selected at random from the catalogues include:-

Russia 1923, typo and recess: Hungary "envelope" design, litho & typo: Australia 2d "Sydney Harbour Bridge" recess & typo: Germany mark values recess in 1902 and offset in 1920: the early Egyptian "Pyramids" typo & litho, and, to quote a contemporary instance, the current 3c Protea definitive of South Africa which has appeared printed in both litho and gravure.
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END.