LESSON EIGHTEEN

Inking

The thickness or consistency of the ink has something to do with the ease with which you can do a good job. Many purpose job black ink is a remarkably good all-purpose ink, but sometimes you will find it necessary to thin it ever so little. Thinning job ink will seldom be necessary, except when running halftone cuts on coated or enameled paper, when the paper has a tendency to pick — that is, the stickiness of the ink causes the type to tear minute pieces of the paper surface away, leaving white spots on the printed impression, and gradually muddying up the ink with paper particles. Bond papers have a hard surface, so that they do not pick — in fact, unless a fairly stiff ink is used they will often refuse to take it. Bond ink is, therefore, made quite stiff, and more than one new printer has assumed that he has received old stock ink, not realizing that bond ink is made that way purposely.

For general book work where you are going to print on soft surface paper like eggshell or antique, it is best to use the book ink. Although the other ink can be thinned, the characteristics of the various inks are not made the same by simply thinning. On coated stock, halftone black is best. Where ink does not dry readily, particularly on hard surfaced paper, an ink dryer will be of help. However, in that regard, you will find the use of as little ink as possible to get a good job the best assurance of drying. If too much ink is used, offsetting results; or the oil and pigment are likely to separate later, to say nothing of the difficulty in drying.

Much difficulty in distribution of ink, muddiness of impression, etc., in winter can be laid to the temperature of the room in which the press is being operated. Be sure that your printing room is at least 70 degrees for at least an hour before you start using the press, so that the rollers, ink, ink table and all parts are thoroughly warmed up.

The amount of ink used on work has a great bearing on how fast printing will dry. Carry less ink on the ink table, and ink more frequently, both for good results and quicker drying. The grade of paper also affects drying, or to be more exact, the kind of paper. Bond paper, having a hard surface, does not absorb much ink and dries slower than book paper or newspaper, which are more or less absorbent. Careful makeready will make less ink necessary, and in addition to a cleaner nicer job, will give quicker drying. It is, of course, necessary to carry a little heavier ink anyway on work with heavy bold faces of type or heavy cuts, than on finer type, such as ordinary six and eight, ten and twelve point faces, and it is likewise necessary to carry enough ink to take care of the heaviest part of the form you are running, so that unless care is taken when mixed work is being run, the ordinary lighter face type will appear overinked. Good makeready and the proper amount of impression is, therefore, doubly advisable to make the necessary amount of ink as small as possible.

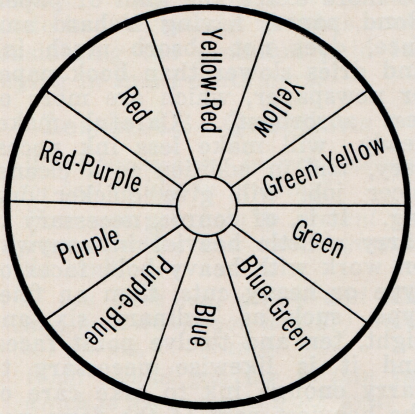
Ink Colors and Shades

Ink makers and printers have been making efforts to develop standardized terms which will enable them to understand each other when buying, selling and specifying various types of ink.

First is HUE, which distinguishes one color from the other, such as red from yellow, or blue. Next is VALUE, which is the lightness or darkness of a specific color, just as we measure the various shades of black down through the greys to white. Third is CHROMA, which is the strength of the color. This latter is a little more difficult to describe, but such strength, or chroma is apparent, for instance, in a bright blue, rather than in grey blue.

The diagram shown has two purposes. In the first place, the colors opposite each other on this chart are complementary; that is, taken together they include all the ele-

ments of light. Between them they obtain all the colors. These opposites also offer the strongest contrast, when used together. The chart also shows the colors which may be blended together to make a pleasing hue or shade.



In using and making colors, their effect on the eye, and the idiosyncracies of vision have to be taken into account. Using two colors together will often change their appearance to the eye, particularly if the background color is complementary to the overprint. For instance, use a green on yellow background and the green will look bluer. Such apparent variations have to be reckoned with when you are making a close match.

Mixing Colored Inks

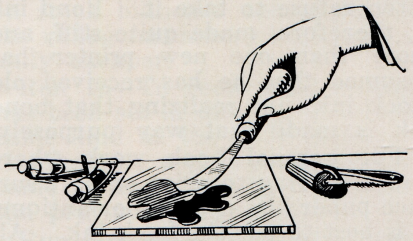
Make sure your colors are mixed thoroughly.

A piece of marble will do for mixing ink, but on colors a slab of glass—plate glass or even window glass—will be better, because you can put a piece of white paper underneath it, and the tint you are mixing will stand out well.

If you are going to use a colored sheet to print on, you can use a piece of that instead of the white, so that while mixing the ink, you can get an idea of how the tint will look when printed. You will find this method of matching colors a particularly satisfactory one.

A flexible bladed ink knife, spatula or putty knife will see to it that no particles of unmixed color are left on the slab or blade of the knife.

Do not mix or put an ink, other than straight black, on your press unless your rollers, ink plate and every part of your machine and type form which comes in contact with the ink is completely clean. To obtain satisfactory light color, you may have to wash or clean your rollers as many as three times. They may look entirely clean after the first washup, but there may be just enough black in pricks, cuts and pinholes of the rollers to dull your color. If your rollers are not in first class shape it may be best to put them aside for black work, and obtain a set to keep for color work only. Always keep your best rollers for color printing. Several pairs of rollers are an economy in many ways.



An ink knife or a piece of brass rule and a piece of window glass are desirable, altho you can mix inks on the back of a steel galley.

If you are anxious to match another job, or are particular as to what color you are going to use, it is best to mix ink only in daylight, or, if that is not possible, get one of the blue, so-called daylight electric light bulbs, which will give you as near artificial daylight as can be made. They cost only a few cents more than the ordinary, and you will find them much more pleasing to work under in almost all kinds of work. Daylight fluorescents are also good for mixing.

Four or five different colors of ink will enable you to mix almost any tint in the rainbow and out of it. You will want black, red, yellow, blue and mixing white. If you do much color work it will save time to have green, orange,

brown and purple as well, but they are not necessary. In mixing, always use the lighter color as a base, that is, put a small quantity of the darker into the lighter, rather than the reverse, because a little dark will go a long way, and if you try to lighten up an already dark ink you will mix so much you will never be able to use it.

Lighter tints of the same color are always made by using the color itself in mixing white ink. Of course if you want a yellow green which is really lighter than the original, you will use yellow, but that is really changing the tint, not merely lightening it. Green may be made by mixing blue and yellow, the tint depending upon the proportion of the two. Purple comes from red and blue. We believe, however, you will find it more economical to purchase ready made green and purple, and confine your mixing to the tints which cannot so easily be obtained.

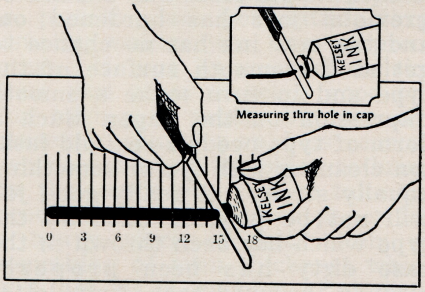
Care should be taken to determine which colors will go best together, if you are going to print in two or more. Save all samples of colored work which come your way, in addition to those you print yourself. From them you can often select a color combination which will be very pleasing without loss of time thru experimenting.

Another great aid to matching tints and colors, or finding a satisfactory shade is a series of charted colors like Kelsey's, with exact directions for producing the particular color on each card.

How To Measure Out Ink When Mixing Colors

The illustration shows an accurate way of measuring ink when you are mixing two or more colors to make a given shade. It is of particular value when using Kelsey color plates, but it will also be of help if you need to match a sample tint of your own more than once. A slab of glass makes a good mixing plate, and you can put a piece of paper or card with ruled lines under the glass.

Some tints require a very small quantity of one or more ingredients, and for that, an ink cap with a small hole drilled in it is very handy. Save the cap or caps from used-up tubes, and if you drill a hole approximately a tenth of an inch in diameter (No. 39 size drill) the amount of ink which will come through such a



Use any convenient measuring unit: a pica, an inch, etc.

hole is 1/16 as much as from the tube with the cap off. After measuring the ink with the drilled cap, take it off and put the regular one on. The drilled cap can be kept in a jar of water to prevent hardening of ink in it, or you can clean it before putting away.

The measurements on the paper under the glass may be in picas, inches, or any other convenient scale. The Kelsey chart colors are usually worked on the basis of inches and fractions of an inch, so that there will be a uniform standard.

Muddy Impressions — How to Eliminate Them

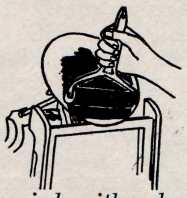
Probably the leading cause of muddy impressions, particularly among new printers is the use of too much ink. The beginner will not realize that a very small bit of ink will go a remarkably long way, and the printer who is not a beginner, but who has not had long experience — and many who think they have had it—will load on ink, when what is required is better impression, better rollers, better distribution, a little more

heat in the room, or any one of several other things — anything but more ink. Another point—if too much ink is put on, it may look passable at first, but gradually the oil will separate from the pigment, and make a tiny ring around each letter on the paper.

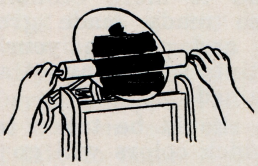
There is another result which comes as a retribution to the printer who has been careless about cleaning his type before putting it back in the case. The old ink of previous jobs has hardened on, and the new ink has no chance to get at the smooth surface of the type and in turn make a smooth impression on the paper. Such a form of type needs a real old fashion cleaning with lye or something equally strong. A really good job will not be possible until all the type which has been thrown in the case dirty has been properly cleaned, because each dirty letter will stick up above its brothers and be conspicuously muddy. Type should be first wiped with a cloth saturated with a cleaner, then it may be brushed, and after that a final wipe-up should be administered with the cloth. The cleaner your type, the longer it will last and give satisfactory service.

Too low a temperature in the room in which you are working will cause muddy impressions, because ink can only work at its best when it is used in a temperature of 70 degrees or over. The press, the rollers and the ink should all have been in such a temperature at least an hour before using the press, so that the metal as well as the ink and roller composition have had time to become warmed. The fine results often experienced toward the latter part of a job are usually due to better temperature conditions, as well as more thoro working in of the ink—which, by the way is important if it is to behave properly. The handiest way to work up the ink is to use a hand roller, but one of the press rollers can be used if the hand roller (brayer) is not available. When you put ink on the plate, smooth it out perfectly before running the rollers over the plate and then the type form. Otherwise the undistributed ink will get onto the tvpe and make a muddy impression. The ink should be so smoothly worked out on the plate that no signs of the new ink just put on are visible anywhere on its surface.

Old, hard rollers will give a muddy appearance to jobs, as will any kind of sliding instead of rolling on their part. Roller supporters will often help under particularly difficult conditions. They may be made by locking furniture into the ends of the chase, type high, or you can purchase those



Spreading ink with a hand roller



If you have no hand roller (brayer) use one of your press rollers

made of metal, which take very little room in the chase, yet offer a bigger bearing surface than the wood variety, since they are made to hang over the outside edge of the chase, being in L shape. If the sheet of paper you are printing is so big that the supporters get in the way and mark them, a frisket can be used.

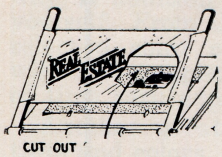
Perhaps your ink is a little thick, in which case a muddy impression will result. A drop of ink reducer, reducing compound or even kerosene will often help. Some printers use vaseline. Look out for the quantity. A very small drop indeed will usually be plenty. Then, perhaps your ink had become dried and there is a lot of skin in it. Keep the ink tube or can tightly closed at all times, and you will avoid trouble with ink. Different inks have different characteristics, as have various colors, but they will all respond to care in handling and keeping airtight.

Taking Proofs in Two or More Colors

There are several ways of getting two or more colors on a proof which if used will quite often bring you a two color order where otherwise only a single color job, with less profit, would be received.

Assuming that you have the job set up, and either tied up with string, secure in a galley, or locked in a chase, you are now ready to see what the job looks like. If you have two or three slabs of glass or marble—small pieces—handy, you will find them very handy to use for mixing ink on, and in this case you can use one for each color you want to try. If you have a hand roller, you will spread the ink with that—if not, you can use one of the press rollers.

Having decided which parts you are going to try in each color, you can now cut a piece of paper in such a shape that it will go over the form and expose only those parts which you wish to print in black, for instance. You can then take your roller and run it over the form, inking only those parts which you wish. Next cut another



Printing a single form in two colors with a frisket.

piece of paper so as to only expose that part of the form which is to show in another color (red, perhaps), and ink that part of the form. This process may be repeated for as many colors as wanted, and if you wish to try several different color combinations, you can do so in this way without inking up the press.

The form is now ready for a proof in the regular manner. Just a word or so about proof-taking may be of help. Here a mallet and planer (block of smooth surfaced wood) come in handy. The form should be on an absolutely smooth surface. If it is in the chase, and you are using the Excelsior press you can take out the chase back and use that. A marble imposing surface is good, or a metal one if it is really flat and smooth.

The better the ink is put on, the better the proof. Lay a piece of news white or other paper on the form, first dampening it just enough so that it is limp. Do not use a sheet which drips water—it will make the ink run. A dry proof is possible but not satisfactory, usually, unless you own a proof press. If you have an Excelsior your own press makes a good one for taking a proof, but we are assuming that for various reasons you do not want to bother to bring up the impression just to take the proof. Over the sheet of paper lay a heavy piece of felt, cloth, or something of even thickness which will act as a cushion. Put your planer or smooth block of wood gently down on the form, being careful not to move the paper, because that will blur the proof. Tap the planer with the mallet, and if the planer is not big enough to cover the form, move it (without disturbing the paper), and tap all parts of the form, so that the paper will be pressed onto the type all over the job. Remove the felt pad and then the sheet very carefully, so as to prevent any chance of blurring.

Some printers get rid of the necessity for a felt pad by covering the planer block with a number of thicknesses of old sheeting, taking great pains to get the bottom smooth; tacking the cloth on at the top. Felt or flannel may be used for this, also, with the sheeting on top outside.

Another method of inking for two or more color proofs takes advantage of the long known fact that the palm and fingers of your hand are an ideal "roller surface." A minute quantity of ink is put on a piece of smooth cardboard, or on the corner of the ink plate, and worked up with a couple of fingers, which are then used to ink the type. By using the fingers you can put the different colors just where you want them.

In the first part of this article we spoke of taking two or three color proofs on one color jobs. Sometimes, if you do this, you can submit it to your customer, and when he finds out what this greatly improved appearance will cost, he will change the order to a color job, with consequent more work—and more pay.

Color Mottling and Ink Weights

Most materials made in colors do not materially differ one from the other, because the coloring matter in them is but a small part of their actual bulk. Not so with ink, however. When you use ink, you utilize practically the basic ingredients, with the addition of the oil, varnish, or whatever the vehicle or solvent may be.

As many of our readers have found to their surprise when they first bought colored inks, a pound of one color may bulk up a lot more than another. Blue is very bulky—white the opposite.

This difference in the basic ingredient of various colors makes them behave differently in the printing. Some colors have a tendency to mottle a little on some grades of paper. Gloss varnish will sometimes help. On particularly fine jobs on some grades of paper, and with some colors, printers will print the same color over twice so as to get the result they want.

However, for average work, colors can usually be depended upon to do a good job without much fussing. The different behavior of different colors is not a sign of varying quality, but an indication of the many sources from which our colors come. While nowadays we may not get our blue from a plant and our red from insects, the modern sources are often almost as diverse in many instances.

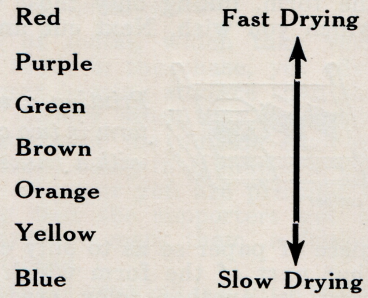
The behavior of colored inks on large solid areas, tint blocks and such work is often improved if a reducing compound specially made for the purpose is added in very small proportions as directed by the makers. When this is done, a drying compound is added at the same time to preserve the ink's drying qualities. This combination will frequently do away with mottling, caking or picking when it occurs.

Bond paper, cellophane, glassine, pyroxylin and other hard surfaces require an ink which will dry without penetrating. Colored inks will often work better on such surfaces with a fixing compound which has been designed for that purpose. Drying compound is sometimes added with it to assure normal action in drying.

Drying Compound

Drying Compound is recommended for adding to Many Purpose Inks to hasten the drying, or wherever ink must dry on the surface of the stock being used. It may be added when Reducing Compound is added and the drying appears to be slow.

Add Drying Compound as required, not more than one part dryer to ten parts of ink, to make it dry faster than usual. If you add Reducing Compound to an ink, you may need to add up to an equal amount of Drying Compound to make sure ink will dry.



The table shows the comparative speeds at which the various colors of ink dry. Red inks usually dry fast and need no dryer—yellow and blue dry more slowly. The other colors come between red and blue in speed of drying. However, except in special cases, colored inks dry satisfactorily when used just as they come from the tube or can.

Reducing Compound

Reducing Compound is recommended for adding to the Many Purpose Inks when printing large solid areas, such as tint blocks, cuts with solid color portions, or wherever mottling, caking, picking, or offsetting (some call it set-off) occurs. When ink dries so fast that it dries on rollers and ink table while press is running, adding up to one part in ten of Reducing Compound, will usually overcome this condition. In this case *do not* add any dryer.

Add one part of Reducing Compound to ten parts of ink, and if necessary, add one part of Drying Compound for each part of Reducing Compound added.

Fixing or Binding Compound

Fixing Compound is recommended for adding to the Many Purpose colored inks for printing on bond papers, many plastics, glassine, cellophane, etc., and all surfaces on which the ink must dry on the surface, rather than penetrate the stock.

Mix thoroly not more than one part of Fixing Compound plus approximately an equal amount of Drying Compound to ten parts of ink, and on some card jobs or on ivory card and coated finish stock, one part of Fixing Compound to 30 parts of ink may be all that is necessary. Experience will be your best guide as to the exact proportions.

Using Ink Economically

While ink purchased in pound or larger containers is cheaper than in tube lots, there will be no economy unless care is taken about removing it or sealing the can when not in use. Contact with air dries ink on the surface in the can as well as on paper, and to dig down into the can without smoothing out the surface afterward will cause oxidation, skinning over and drying in the holes gouged out.

Don't put lumps or skin on your ink table — dispose of them first. After you are through with the can and have levelled off the remaining ink, replace the waxed paper if possible or find another piece of paper to take its place if it is not serviceable. Vaseline or any other similar grease may be used on a piece of ordinary paper in place of waxed or glassine, and the same ingredient rubbed around the rim of the can so that the lid or top will fit easily and tightly.

Tubes have the advantage that they present only one small opening which will skin over, but care must be used, that they do not burst when squeezing. If one hand is used on the bottom (turned over end) and the other up close to the top or opening end, pressure can be exerted at both points and the tube will not suffer. Be sure, however, that there isn't a hard plug of dried ink blocking the opening, because it may seal the tube so effectively that too much pressure will burst the tube. Dig out the end before you squeeze, if there seems the least inclination for the ink to balk about coming out.

To Open Binding Ink Containers

This method is more strictly applicable to tubes, but a variation of it can be used for ink cans.

If the cap on the ink tube refuses to budge, heat the cap with a lighted match. This will soften the ink around the cap, and make opening easy in a great many instances. The cover of an ink can, while being much bigger, may often be persuaded to start in the same way.

To Prevent Ink from Drying in the Can

Ink has an annoying habit of skinning over after the can is once opened, even if the cover is kept on very tightly. Some printers pour water over the top, which prevents air from reaching the ink (air causes the drying). Others recommend a coating of vaseline, and some people use cylinder or machine oil. The oil is inclined to mix a little with the ink, and is therefore the least desirable of the three.

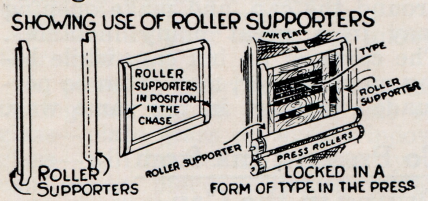
Water is probably the best all around covering, although in spite of that, the ink will dry or skin a little. Many printers find that on job work it is best to buy inks in quarter-pound tubes—even to buy four instead of one pound can—because on the whole there is less waste in inks bought in tubes, even considering the premium paid for buying in small containers.

Lesson 18—Questions

1. *What temperature is recommended for best results in printing?*
2. *How can you help to prevent ink from skinning over and drying in the can?*
3. *If you have red, yellow and blue ink, how would you mix a.) green, b.) purple, c.) orange?*
4. *What should you use to thin ink which is too heavy to work well?*
5. *Should you use bond ink to print a halftone on enameled paper?*

The Printer's DICTIONARY

Roller Supporters — Same as bearers — pieces of metal which can be put in the chase at each end and offer an additional bearing surface for the rollers to prevent sliding.



Rough Proof—As its name implies, it is a proof taken hurriedly, and without any attempt to improve impression.

Routing—Drilling out or otherwise removing blank portions of a cut or plate so that the paper and rollers will not come in contact with them and smudge or otherwise mark the sheet or card being printed.

Rubber Blanket—A rubber sheet usually backed up with fabric, to put on the platen and give more resiliency to the tympan when running very large forms, or when type is so badly worn that the ordinary hard packing does not yield good results.

Rule — Brass or other metal strips, type high, the face of which will print a line, double line, or some variation of a line. There are also fancy rules which may be used the same as type-cast borders.

Rule Work—Any kind of work involving the use of rule, particularly the setting up of ruled forms.

Ruling—Light colored lines on billheads, statements, ledger paper, forms, etc., put on with a special machine equipped with pens. The printer can often produce a satisfactory substitute either with ordinary rule or a special cut made from a pen and ink drawing, but on stock billheads and statements the ruling machinery variety is usually cheaper.

Run In—To reset matter which has been set in display type in the same kind as the body matter, or to eliminate a paragraph (set the same matter so as to run in with the previous paragraph).

Run Over—To carry over words from one line to the next, spacing them out and running the matter along, until it is absorbed, either by closer spacing, or the intervening of a paragraph.

S

Safety Paper—Paper treated and watermarked in various ways to make alteration easily detected. Used mostly for bank checks.

S. and S. C. — Abbreviation for "sized and supercalendered" paper. S. and S. C. is better than S. and C. (Sized and calendered) or M. F. (Machine Finished) but not as good as enamelled or coated paper.

Scoring—The use of cutting or scoring rule to produce a mark or depression in paper or card so that it will fold or bend without breaking or wrinkling. Some printers also employ the term when referring to creasing rule.

(To be continued)