PRINTING INKS.

IN a review of my 'Printers' Handbook,' etc. in the last issue of 'The Library' (October, 1905), my opinion was asked as to whether the ink used by the early printers in Italy in printing with roman types was the same as they used for gothic, it being suggested that they may have deliberately imitated the effect of a more fluid ink used for cursive writing, instead of the stronger ink of the monastic bookhand. The whole question of the inks used in early printing is a very interesting one, and I am pleased to offer some remarks on the subject.

I think that the fact that the inks used in some of the fifteenth-century Italian volumes is of a somewhat brownish tone is due more to accident than design. At that early period, notwithstanding the brilliancy of the black ink used by Gutenberg and his immediate successors, the secret of making such inks was not generally known. As suggested in your review, the precise amount of ink applied does affect the density, or what we printers term 'colour,' and again, a thin-faced type of roman character as compared with one of the gothic order, although printed in the same ink, will give a different effect.

This difference may be observed more or less in sample books issued by the modern typefounder.

In such books will be found side by side specimens of both thick and thin faces in design, which doubtless have been printed at the same time and in the same ink. If only by an optical illusion, these thin faces exhibit a greyish impression as compared with the more solid black effect of the stronger or heavier faces.

As explained in my work under review, many of the incunabula exhibit under a magnifying glass a mottled appearance, probably due to the imperfect incorporation of the carbon with the varnish—the latter being the medium employed in the combination. Insufficient boiling or burning of this necessary oil for this varnish, together with the introduction of sundry minor elements, frequently prevented the essential blending of these two factors—varnish and colouring matter—with the result that after a time the printed letters would sometimes either show a decided yellow tinge round the rims of the letters, or the ink itself would have a tendency to turn brown. Or it might be that both these defects would be exhibited.

Prior to the invention and use of movable types, the block books were most probably printed with a kind of writing ink. To this, in some cases, was added a gummy substance, in order to make the ink take to the block, and at the same time to give off a fairly good impression. Indeed, traces of iron stains have been detected in the ink employed in some block-books, thus proving the use of a compound, partaking more of the writing kind, and not a pigment, or paint, as it were, consisting of varnish and carbon.

It is quite possible that many of the early printers with movable types had not discovered the art or mystery of making suitable pigments, and in the experimental stages produced a composite ink which partook of the more fluid character, and the absence or insufficiency of the essential carbon may account for the undecided blackness of the inks employed.

Moxon, in his 'Mechanick Exercises as applied to the Art of Printing,' 2 vols., 1683, is our first authority on printing inks, and he quotes two Dutch methods of making these inks. His account is somewhat long, but it is interesting and very quaint in its many instructions. Briefly, to make a proper and workable ink, well matured linseed oil of the best quality was needful. The most important point in its manufacture was, as already said, that it should be thoroughly well boiled and burned in this process.

Moxon tells us, ¶ 23, pp. 75-80, in vol. i of his work:

The providing of good *Inck*, or rather good *Varnish* for *Inck*, is none of the least incumbent cares upon our *Master-Printer*, though Custom has almost made it so here in *England*; for the process of making *Inck* being as well laborious to the Body, as noysom and ungrateful to the Sence, and by several odd accidents dangerous of Firing the Place it is made in, Our *English Master Printers* do generally discharge themselves of that trouble; and instead of having good *Inck*, content themselves that they pay an *Inck-maker* for good *Inck*, which may yet be better or worse according to the Conscience of the *Inck-maker*.

That our Neighbours the *Hollanders* who exhibit Patterns of good *Printing* to all the World, are careful and industrious in all the circumstances of good *Printing*, is

very notorious to all Book-men; yet should they content themselves with such *Inck* as we do, their Work would appear notwithstanding the other circumstances they observe, far less graceful than it does, as well as ours would appear more beautiful if we used such *Inck* as they do: for there is many Reasons, considering how the *Inck* is made with us and with them, why their *Inck* must needs be better than ours. As *First*, They make theirs all of good old *Linseed-Oyl* alone, and perhaps a little *Rosin* in it sometimes, when as our *Inck-makers* to save charges mingle many times *Trane-Oyl* among theirs, and a great deal of *Rosin*; which *Trane-Oyl* by its grossness, Furs and Choaks up a *Form*, and by its fatness hinders the *Inck* from drying; so that when the work comes to the *Binders*, it *Sets off*; and besides is dull, smeary and unpleasant to the Eye. And the *Rosin* if too great a quantity be put in, and the *Form* be not very *Lean Beaten*, makes the *Inck* turn yellow: And the same does New *Linseed-Oyl*.

Secondly, They seldom *Boyl* or *Burn* it to that consistence the *Hollanders* do, because they not only save labour and Fewel, but have a greater weight of *Inck* out of the same quantity of *Oyl* when less *Burnt* away than when more burnt away; which want of Burning makes the *Inck* also, though made of good old *Linseed Oyl*, Fat and Smeary, and hinders its *Drying*; so that when it comes to the *Binders* it also *Sets off*.

Thirdly, They do not use that way of clearing their *Inck* the *Hollanders* do, or indeed any other way than meer Burning it, whereby the *Inck* remains more *Oily* and *Greasie* than if it were well clarified.

Fourthly, They to save the *Press-man* the labour of *Rubbing* the *Blackening* into *Varnish* on the *Inck-Block*, *Boyl* the *Blackening* in the *Varnish*, or at least put the *Blackening* in whilst the *Varnish* is yet *Boiling-hot*, which so *Burns* and *Rubifies* the *Blackening*, that it loses much of its brisk and vivid black complexion.

* *Fifthly*, Because *Blackening* is dear, and adds little to the

weight of *Inck*, they stint themselves to a quantity which they exceed not; so that sometimes the *Inck* proves so unsufferable *Pale*, that the *Press-man* is forc'd to *Rub* in more *Blacking* upon the *Block*; yet this he is often so loth to do, that he will rather hazard the content the Colour shall give, than take the pains to amend it: satisfying himself that he can lay the blame upon the *Inck-maker*.

Having thus hinted at the difference between the *Dutch* and *English Inck*, I shall now give you the Receipt and manner of making the *Dutch Varnish*.

They provide a *Kettle* or a *Caldron*, but a *Caldron* is more proper. This Vessel should hold twice so much *Oyl* as they intend to *Boyl*, that the *Scum* may be some considerable time a *Rising* from the top of the *Oyl* to the top of the Vessel to prevent danger. This *Caldron* hath a Copper Cover to fit the mouth of it, and this Cover hath an Handle at the top of it to take it off and put it on by. This Caldron is set upon a good strong Iron *Trevet*, and fill'd half full of old *Linseed Oyl*, the older the better, and hath a good Fire made under it of solid matter, either *Sea Coal*, *Charcoal* or pretty big Clumps of Wood that will burn well without much Flame; for should the Flame rise too high, and the *Oyl* be very hot at the taking off the Cover of the *Caldron*, the fume of the *Oyl* might be apt to take Fire at the Flame, and endanger the loss of the *Oyl* and Firing the House: Thus they let *Oyl* heat in the *Caldron* till they think it is Boyling hot; which to know, they peel the outer Films of an *Oynion* off it, and prick the *Oynion* fast upon the end of a small long Stick, and so put it into the heating *Oyl*: If it be Boyling-hot, or almost Boyling-hot, the *Oynion* will put the *Oyl* into a Fermentation, so that a *Scum* will gather on the top of the *Oyl*, and rise by degrees, and that more or less according as it is more or less Hot: But if it be so very Hot that the *Scum* rises apace, they quickly take the *Oynion* out, and by degrees the *Scum* will fall. But if the *Oyl* be Hot enough, and they intend to put any *Rosin* in, the quantity is to

every Gallon of *Oyl* half a Pound, or rarely a whole Pound. The *Rosin* they beat small in a *Mortar*, and with an Iron Ladle, or else by an Handfull at a time strew it in gently into the *Oyl* lest it make the Scum rise too fast; but every Ladlefull or Handfull they put in so leasurely after one another, that the first must be wholly dissolved before they put any more in; for else the Scum will Rise too fast, as aforesaid: So that you may perceive a great care is to keep the Scum down: For if it Boyl over into the Fire never so little, the whole Body of *Oyl* will take Fire immediately.

If the *Oyl* be Hot enough to *Burn*, they *Burn* it, and that so often till it be *Hard* enough, which sometimes is six, seven, eight times or more.

To *Burn* it they take a long small Stick, or double up half a Sheet of Paper, and light one end to set Fire to the *Oyl*; It will presently Take if the *Oyl* be Hot enough, if not, they Boyl it longer, till it be.

To try if it be *Hard* enough, they put the end of a Stick into the *Oyl*, which will lick up about three or four drops, which they put upon an Oyster shell, or some such thing, and set it by to cool, and when it is cold they touch it with their Fore or Middle-Finger and Thumb, and try its consistence by sticking together of their Finger and Thumb; for if it draw stiff like strong *Turpentine* it is *Hard* enough, if not, they Boyl it longer, or *Burn* it again till it be so consolidated.

When it is well Boyled they throw in an Ounce of Letharge of Silver to every four Gallons of *Oyl* to Clarifie it, and Boyl it gently once again, and then take it off the Fire to stand and cool, and when it is cool enough to put their Hand in, they Strain it through a Linnen Cloath, and with their Hands wring all the *Varnish* out into a Leaded Stone Pot or Pan, and keeping it covered, set it by for their use; The longer it stands by the better, because it is less subject to turn Yellow on the Paper that is Printed with it.

This is the *Dutch* way of making *Varnish*, and the way the English *Inck-makers* ought to use.

Note, First, That the *Varnish* may be made without *Burning* the *Oyl*, viz. only with well and long Boyling it; for *Burning* is but a violent way of Boyling, to consolidate it the sooner.

Secondly, That an *Apple* or a *Crust of Bread*, &c. stuck upon the end of a Stick instead of an *Oynion* will also make the Scum of the *Oyl* rise: For it is only the Air contained in the Pores of the *Apple*, *Crust*, or *Oynion*, &c. pressed or forced out by the violent heat of the *Oyl*, that raises the many Bubbles on the top of the *Oyl*: And the connection of those Bubbles are vulgarly called *Scum*.

Thirdly, The English *Inck-makers* that often make *Inck*, and that in great quantities, because one Man may serve all *England*, instead of setting a *Caldron* on a *Trevet*, build a *Furnace* under a great *Caldron*, and Trim it about so with Brick, that it boils far sooner and more securely than on a *Trevet*; because if the *Oyl* should chance to Boil over, yet can it not run into the Fire, being Fenced round about with Brick as aforesaid, and the *Stoking-hole* lying far under the *Caldron*.

Fourthly, When for want of a *Caldron* the *Master-Printer* makes *Varnish* in a *Kettle*, He provides a great piece of thick *Canvass*, big enough when three or four double to cover the *Kettle*, and also to hang half round the sides of the *Kettle*: This *Canvass* (to make it more soluble) is wet in Water, and the Water well wrung out again, so that the *Canvass* remains only moist: Its use is to throw flat over the Mouth of the *Kettle* when the *Oyl* is *Burning*, to keep the smoak in, that it may stifle the Flame when they see cause to put it out. But the Water as was said before, must be very well wrung out of the *Canvass*, for should but a drop or two fall from the sides of it into the *Oyl* when it is *Burning*, it will so enrage the *Oyl*, and raise the *Scum*, that it might endanger the working over the top of the *Kettle*.

Subsequent writers on the art of typography up to the commencement of the nineteenth century, including both Johnson and Hansard, usually quoted Moxon as their authority for the making of printing inks. Moxon, in writing of this Dutch method, describes very fully the method of preparing the varnish from oil, but, curiously enough, omits all mention of any colouring matter, either as to materials, quality or quantity to be used. The assumption is that the colour was always mixed in as required by the printer at the last moment, and this may largely explain the great variation in colour observed in English books printed during the seventeenth and eighteenth centuries, many of which, if not deficient in colour, frequently exhibit a dirty black appearance, possibly due to an excess of carbon, or it may have been that this colouring matter was not sufficiently mixed or ground in thoroughly by the pressman, preparatory to its use in printing.

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