The Matrix Conundrum

Mark Wilson

Insofar as typographic printing plate production is concerned, we are convinced that one aspect of the traditional literature is correct: electroplating was used to fabricate typographic plates. We will not describe the details of the electroplating process in this article save to take note of the fact that electroplating required a *negative mould,* meaning its relief aspects were reversed when compared to the plate it was to produce. In the traditional literature this mould was made of metal and called a *matrix*; the manufacturing process itself was termed *matrix-based typographic plate production*.

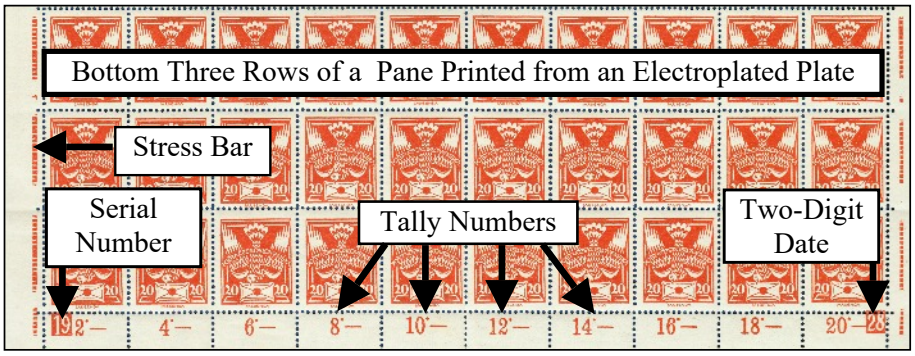

Fig. 1: Section of 20 Haler Type II, Plate 54, Showing Constant Components.

Fig. 2: A Plate's Tally Numbers. (This is not a patrice!)

Most matrix-produced plates have a set of four common features: stress bars, a serial number, a two-digit date, and a replica of 100 cliché etched plate (Fig. 1). To simplify discussion and avoid repeating *replica of a 100 cliché plate*, I would like to introduce a term used to describe that object in the Czech literature: *patrice*. The word means *die* or *punch* according to my Czech technical dictionary, but the word *die* carries with it the context of a single cliché and *punch* is too vague a term, so I shall adopt the term *patrice* to represent the 100 cliché plate used in the production of a mould.

All of the available Czech philatelic sources imply a negative mould made of metal was used directly to produce electroplated copies to be employed as new printing plates. The same sources also admit there is no evidence as to how these moulds were created or even how they were used; all is conjecture. In the past, I had accepted that line of thought as it appeared plausible. I now believe this aspect of the traditional literature concerning typographic plates is incorrect.

Johan Sevenhuijsen recently reviewed a number of sources that offered no support for the negative metal mould theory. Instead, his sources indicated printing houses commonly used negative wax moulds (or perhaps moulds made from a similar pliable substance) to produce electroplated printing plates. For detailed information, please refer to Johan's article which is available online at http://knihtisk.org/store/09-group/02/wax.pdf.

Johan and I had then a spirited back and forth discussion. Reliance upon wax moulds presents a major problem. Johan's sources indicated that a negative wax mould could only be used to produce a single plate. However, we know from our plating studies that many printing plates were taken from the same mould-producing source. We know this because examination clearly demonstrates that every plate taken from that source has its stress bars at precisely the same distance from its clichés. This consistency may have contributed to a belief (because the stress bars would have been integral to a metal mould) that negative metal moulds were used rather than negative wax moulds. It is easy to envision a negative metal mould composed of a patrice and stress bars. Obviously, such a device could be used repeatedly.

However, since a wax mould could only be used once, each wax mould had to be constructed anew. Thus, while a negative wax mould could be used to electroplate one printing plate, it could not have stood on its own. Wax moulds require an additional step in the plate manufacturing process.

Johan suggested the following scenario. A patrice and its stress bars were firmly attached to a wooden platform, forming a positive metal matrix. Whenever new plates were needed, wax moulds could be taken from this positive matrix and one new plate produced from each negative wax mould. If this is true, the problem of the constant stress bar to cliché distance for wax moulds is solved. We have, not as the traditional literature suggests a negative metal matrix/mould used directly for electroplating, but a positive metal matrix one step removed from the electroplating process. It was used to repeatedly produce negative wax moulds from which additional electroplated copies could be taken.

We are left with another problem. Unlike the stress bars, the serial number and two-digit date components change dramatically from plate to plate, not only in the information contained (the actual number and date) but also in the very shape of the digits. This means that the serial number and two-digit date information could not have been integral parts of a positive metal matrix.

Notice in particular that while the stress bars are clearly placed adjacent to the plate, the serial number and date are positioned within the area of the plate itself near where its tally numbers appear. Fig. 2 shows that the tally numbers are part of a plate itself: thus the serial number and date were superimposed upon the patrice rather than being adjacent to it. If we are to accept as our model the use of a positive metal matrix and negative wax moulds for typographic plate production, we must explain how the serial numbers and dates were made to later appear on a printed pane.

The mechanics of typographic plate production all but require that these latter two informational components be a part of the matrix. This is because typographic – or relief – printing requires that all inked surfaces, the lands,* be at

exactly the same height. Even a slight difference causes havoc. If these objects were below the level of the patrice they would receive no ink. On the other hand, were they above it the decimal line next to the date in Fig. 1 would not receive ink (it obviously has as it is printed on the pane).

Thus, we must solve this set of four problems when dealing with the serial number and date. First, they appear within the area of the plate itself. Second, they represent different objects for every electroplated plate (they differ in information and appearance). Third, they must be located in the same precise position on each patrice but may vary somewhat between different patrices. Finally, they must be set at the same level as the surface of the patrice.

Johan suggested that the lands supporting the serial number were indeed part of the patrice but that the information contained on the lands (the serial and date digits) were engraved on a new printing plate after the electroplating process. This would answer the four conditions above. First, as part of the patrice, they obviously would appear within the area of the plate itself. Second, engraving the information on a completed electroplated printing plate allows for the required changes in content and appearance. In addition, engraving the digits – placing them below the level of the lands – would produce white digits, as is the case for the serial numbers and dates (Fig. 3). Third, as part of the patrice the two lands would remain in their required constant position relative to the clichés. Finally, if these two lands were etched at the same time as the patrice they were part of, they would be at the same level as all the other lands on the plate.

We are now left with only one question to answer. How did these lands which were not present on etched plates be made to appear on a patrice? There are two possibilities. Perhaps before transferring the image from a glass negative to a plate being prepared as a patrice, the printer removed emulsion from the negative in the appropriate places – to the left of the first tally number and to the right if the last tally number (see Fig 3). This would create the required lands during the course of the patrice's normal etching.

However, the fact that the lands are in different places for the first and second matrix in Fig. 3 means that the negative could not have been altered. It is unreasonable to believe the printer replaced the emulsion removed for the first patrice then removed it again – slightly differently – for the second patrice. Rather, it is far more likely that before the patrice was etched the printer coated the required places on the plate with the same etch-resistant substance that protected its other lands from being etched away.

So, instead of a negative metal matrix being used to produce the electroplated typographic printing plates, the printer employed a far more common technique. First, the image on the original glass negative was transferred to a metal plate intended for use as a patrice. Next, the printer coated two small areas with an etch-resistant substance: one to the left of the first tally number and one to the right of the last tally number. The patrice was then etched and, accompanied by its stress bars, mounted to a wooden platform. Negative wax moulds were repeatedly taken from the positive metal matrix, electroplated, and then the new lands introduced by the patrice were engraved with an identifying serial number and two-digit date.

First Matrix Second Matrix Third Matrix

Fig. 3. Positioning of Serial Numbers and Dates,
For the first matrix the serial number and date are slightly offset from the cliché's sides but for the second and third matrices only the date is offset. The latter two matrices used the same patrice.
As the lands for the serial number and date were part of the patrice, that similarity naturally followed.

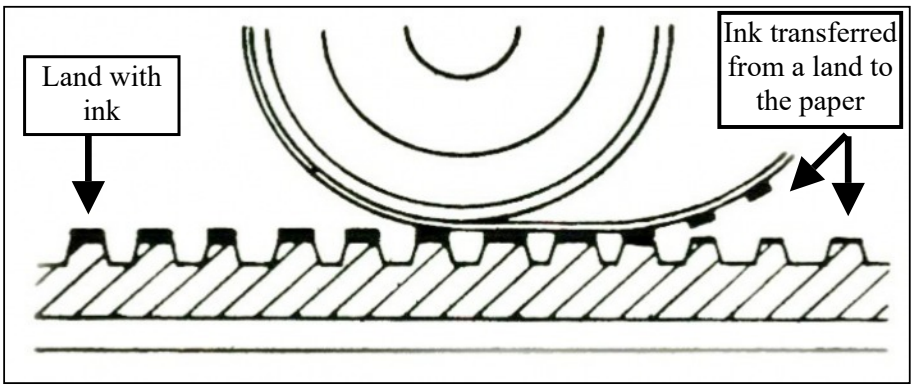

Fig. 4. Schematic of Lands on a Typographic Printing Plate.

*Note: Lands are the raised features on a typographic plate that take the ink (Fig. 4).