

BLUe blood in math mode?

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Abstract

Some time ago I started work on a book (a collection of letters written by one of the most renowned Dutch publishers, Johan Polak) and at the time I was typesetting it in the Palatino font. Then I heard that the creator of Palatino, the world famous Hermann Zapf, has worked with Donald Knuth. What did they do, I wondered? Is T_EX more famous than we think it is? Did the fingers of both geniuses touch in the creation of our Math fonts? The replies to my queries in T_YP_O-L were promising. You decide.

Zapf meets Knuth

Barbara Beeton wrote:

re Donald Knuth and Hermann Zapf: when Knuth created METAFONT, he enlisted the best help he could get to give him guidance and critique on the font he created (Computer Modern). Hermann Zapf visited Stanford University and, as I understand it, Knuth tried to teach him to use METAFONT, but ultimately Zapf worked as artist and Knuth as supporting craftsman (kind of the relationship between font designer and punchcutter). I'm not sure what, if anything, original came out of this cooperative effort (see below concerning Euler), but the quality of Computer Modern in its m_f84 incarnation is very much improved because of it.

Zapf may also have had some influence on the Concrete variation on Computer Modern; certainly his Euler font had a direct influence (ordinary Computer Modern by comparison had too much stroke weight variation for Knuth's taste, so he generated a new set of parameters to produce an Egyptian-style font, and I suspect that Knuth showed Zapf Computer Concrete before publication of Concrete Mathematics), but I can't find any references to him actually critiquing it.

The Euler fonts came out of a suggestion made by Knuth to the American Math Society to create new alphabets for use as math symbols. Zapf, on Knuth's recommendation, prepared drawings of the shapes, and these were examined by a committee comprising of American Mathematical Society staff members and mathematicians with publishing experience. After several iterations of comments and revisions, the drawings were approved, and the work moved to Stanford. Scott Kim, one of Knuth's graduate students, began to create METAFONT programs for the penstrokes from which the font could be assembled. In the event, the facilities of m_f79 proved unsuitable for the task. However, this experience led to the drastic revision of METAFONT

(yielding m_f84) which provides for filled-in outlines as the norm rather than penstrokes.

The Euler fonts were finally rendered in (non-meta) METAFONT code by another group of graduate students using a graphics tablet to enter coordinates and tangent directions, and this is what we have today. This was all done under Knuth's scrutiny with timely consulting from Zapf, who also gave final approval to the project results. Knuth subsequently made a few modifications to a few letter shapes, and added an extension font containing versions of, e.g., summation and integral signs that blend more neatly with the Euler (and Concrete) shapes than the original Computer Modern versions; Zapf looked at these as well, and gave them his blessing. I know that Knuth and Zapf are still in touch with one another, but I don't know of any current or envisioned projects.

3:16

This still leaves unanswered the question of precisely what *did* Knuth and Zapf work on together. I know that both were involved in designing and producing the book '3:16'¹ that Frans Goddijn mentions, but that's not work on fonts, strictly speaking. I can't find a record of anything else in my T_EX archives, which go back to 1979, so I suspect that it was largely the joint learning experience that occupied them.

Palatino myths

Steven Skaggs, who studied with Zapf, wrote:

(. . .) I might have something to contribute to the Palatino debate. While I can't recall a specific instance when the subject of classification came up in my studies with Zapf, I think he would agree with a position that would say that the terms Old Style, Modern, Egyptian etc. . . simply act as broad handles for folks to use when discussing type. It is not so important to the designer that a given typeface is

¹ '3:16', publ. A-R Editions, Inc., 801 Deming Way, Madison, WI 53717, tel. 00-1-608-836-9000.

‘correctly’ categorized. Of course, as these categories are to a large extent historically derived, and reference a tradition from which new typefaces grow, they are still useful in suggesting likely stylistic features. If I were to say to you that I’m designing a new face and that it is Old Style, you already have a sense of the basic serif construction, weight, axis and so on.

Zapf designed Palatino after a trip to Italy following the war. The great contribution of Palatino (named after the Paltine hill overlooking the Forum Romanum) in my opinion is that it reflects the movement of the chisel edged pen without appearing unduely ‘quaint’ or forced (i.e. the faces of Wm. Morris et al at the century’s birth). Instead he has produced a face based upon the Humanist minuscule script that is an adaptation of the pen technology into the technology of steel. Only a calligrapher who is immersed also in type production and printing can do this.

Whereas designers from Griffo to Robert Estienne to Morrison to Rogers based faces upon earlier faces (Nicolas Jenson primarily), Zapf like Sweynhem and Pannartz or like Jenson himself began with the script as the model. While Palatino may seem too decorative for some occasions, and while it does exhibit the feel of the pen, I would stop short of placing it in a category of Novelty or Decorative faces. We grow tired of Palatino for the same reason we grew tired of Helvetica - it is simply overused. As Univers replaced Helvetica in fashion, so Garamond replaced Palatino. It certainly is no inherent fault of the face itself.

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Post-creational inspiration?

Hermann Zapf himself gave rise to the romantic assumption that the Palatino font was inspired by a trip to Italy, but facts prove that in this case, the inspiration must have come *after* the creation, as is shown by the researches of Dutch NTG member Erik Jan Vens:

‘From Sebastian Carter, *Twentieth Century Typedesigners*, p. 146ff:

“In 1941, Zapf was called up, and served as an army cartographer in France, first in Dijon and later Bordeaux, where he began a set of flower drawings which were used in *Das Blumen-ABC*, again cut by Rosenberger and published by the Stempel press in 1948. His war service ended as technically a French prisoner in various military hospitals, but he was quickly released.

On his return he took up the design direction of Stempel, and began the enormous task of rebuilding its repertoire of faces after the devastation of the war. Already in 1946 he had begun work on a pen-formed roman called Novalis, which was not dissimilar to Warren Chappell’s pre-war Trajanus for the same foundry, but was never issued. This work was quickly overtaken by a new face based on Renaissance forms for which the first drawings were ready in 1948, and which made its first appearance

in the introduction to *Feder und Stichel* the following year. It was called Palatino.

Palatino has proved so universally popular that its remarkable qualities tend to be taken for granted. Zapf himself wrote in *About alphabets*,² “The studies and sketches of my Italian visit were converted into the Palatino type family, their very names suggesting Italian models”, and certainly the type’s classical sense of proportion shows every sign of the powerful impact made by the experience of his first visit to Italy on an impressionable young man who had hitherto been working in the Koch tradition. Palatino is so completely unlike such characteristic pre-war German roman types as Weiss Antiqua and Koch’s Marathon that the direct influence of Italian lettering seems needed to explain it.

Nevertheless, the fact is that Zapf did not go to Italy until the Autumn of 1950, by which time Palatino and Michelangelo, those miracles of Renaissance grace, were already cut. Only Sistina, the more robust titling fount, was based on sketches actually made in Italy.

Together with this extraordinary and apparently instinctive absorption of classical letter forms, Palatino still shows beneath its surface the stirrings of penmanship learned from Koch, which leaves small but vital traces on the contours of the letters. While this is never allowed to dominate the shapes, it gives the type its crispness, and prevents it ever becoming bland. The earliest cuttings were more calligraphic in some details, such as the absence of serifs on the tails of p and q, but these were added later.

Palatino was immediately adapted for Linotype composition, since Stempel had held the contract for making matrices for the German brand of Mergenthaler Linotype since 1900, and it has since been adapted for virtually every typesetting system in the West. As it was found somewhat heavy in weight for text setting in the smaller sizes, Zapf designed a lighter version, called Aldus, for Linotype composition sizes (1952-3).”

Again from Carter, p. 154:

“In 1977, Zapf was appointed Professor of Typographic Computer Programs at the Rochester Institute of Technology in New York State, and in 1983 his work with the Metafont design program developed by Professor Donald Knuth at Stanford University produced the Euler type family for the American Mathematical Society. The basic roman is, like Zapf Chancery, really an upright italic, with rounded contours rather in the manner of Goudy; and there are script, italic and even Fraktur versions, as well as many mathematical sorts.”

Lapidary majuscules

This globe-spanning conversation of networking letterfreaks which took place around the turn of the year 1993/4 ended with a message from Freek Wiedijk:

From *Anatomy of a Typeface* by Alexander Lawson, page 124:

“Following his work on Palatino, Zapf went to Italy, visiting Florence, Rome, and Pisa in order to study firsthand the Roman inscriptional letters found there in such pro-

²Hermann Zapf, *About alphabets, some marginal notes on type design*, New York, The Typophiles, 1960 (Revised edition, MIT Press, 1970).

fusion. The sketches he made at this time later became the basis for the Palatino titling fonts Michelangelo and Sistina. The influence of the classical lapidary majuscules is evident throughout the Palatino family, markedly in E, F, and L, which retain the narrow proportions. The swash variants he produced for Palatino italic stem particularly from studies in the Laurentian Library in Florence and the Vatican Library in Rome.”

Hope this helps a bit.

(By the way, if you haven't been there, you should visit Valenton & Henstra in the Nes (behind the Dam) in Amsterdam, where I bought A.o.a.T. It's a great bookstore, specialised in typography.)

Freek

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Charles Kinbote

Can we draw any conclusions as to the chance of us having a blue-blooded math font out of the artistic match of Knuth & Zapf? If I behold the beauty in the old style numbers, which have long held itself in disguise as Math Italic, I must say it reminds me of the anonymous king in Vladimir Nabokov's masterpiece 'Pale Fire'³. And if some say I have digressed a bit too far from my subject, I'll end with a remark Charles Kinbote wrote after a footnote of his that was as fascinating as it was beside the point:

'I trust the reader has enjoyed this note'

³ Annotated by Charles Kinbote.