In some cases, such information can be derived 'after the fact' (from existing images) and appended to a digital font; but it is not difficult to imagine that such a shotgun marriage of image information and .tfm information will tend not to result in a happy and harmonious union of the two. Quite simply, the simultaneous creation of image and .tfm information as done with METAFONT produces the best results.

More critically, there are some other subtler bits of information in font metric files that are much more nearly impossible to imagine creating with any tool other than METAFONT. Those are the various tidbits in the math/science and symbols fonts that are crucial to the fine setting of equations and formulæ that is one of TₑX's strengths. These fonts must have a wealth of information that controls positioning and even the composition of certain characters (built up curly brackets, square brackets, integrals, radicals).

The modern typographer must now understand that his art has become an interdisciplinary pursuit and involves mathematics and programming skills as well as the traditional design concerns. While most current typographers will fail to adjust to this radically different method of type design, there will be many newcomers who will use METAFONT to contribute the beautiful digital typefaces that TₑX needs for unprecedentedly superb typesetting.

Powell, Ohio
24 May 1986

The TₑX Logo in Various Fonts

Donald E. Knuth

According to the plain TₑX macro package described in *The TₑXbook*,

```
\def\TeX{T\kern-.1667em\lower.5ex
        \hbox{E}\kern-.125emX}
```

is the "official" definition of TₑX's logo. But the plain TₑX macros are specifically oriented to the Computer Modern fonts. Other typefaces call for variations in the backspacing, in order to preserve the logo's general flavor.

The definition above seems to work satisfactorily with the main seriffed fonts of Computer Modern (i.e., with all sizes of cmr and cmsl and cmti and cmbx); but sans-serif types are a different story. Indeed, *The TₑXbook* itself gives alternative definitions of '\TeX' on pages 418 and 419, one for the font cmssdc10 at 40pt used in chapter titles (cf. page 36) and one for the cmssq fonts used in quotations at the ends of chapters (cf. page 337).

My purpose in this note is to record the various versions of '\TeX' that were actually used to typeset the books in the *Computers & Typesetting* series, so that it will be easy to make forgeries of the particular style used there.

In every case the 'E' has been lowered by .5ex (half of the x-height); the only variation is in the amount of backspacing represented by the two \kern instructions. Let us therefore consider a "generic" TₑX logo to be defined by

```
\def\TeX{T\kern α em\lower.5ex
        \hbox{E}\kern β emX}
```

for some α and β. The following values of (α, β) were actually used in the published volumes:

font family	α	β
cmr	−.1667	−.125
cmsl	−.1667	−.125
cmti	−.1667	−.125
cmbx	−.1667	−.125
cmssdc	−.2	−.06
cmssq	−.2	0
cmssqi	−.2	0
cmss	−.15	0
cmssi	−.2	0
cmssbx	−.1	0

(The last three were used only to typeset the jacket copy, not the "real" texts inside. It took a bit of fiddling to get the spacing right.)

I've had little experience with other fonts, but they seem to respond to a similar treatment. For example, my paper on "Literate Programming" in *The Computer Journal* **27** (1984), 97–111, was typeset in a variant of Times Roman, and the standard \TeX macro worked fine. The captions and references in that article were set in Univers; for that sans-serif font we used $(\alpha, \beta) = (−.2, 0)$ as in cmssq.