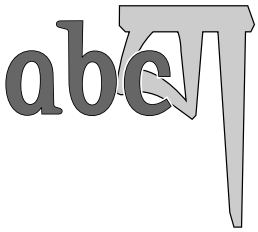
Custom type design

Meeting report by Conrad Taylor

Why design typefaces, when so many of them exist already? For our May 1995 meeting, Peter Lofting and Bruno Maag gave examples of why it can make perfect sense for various technical, commercial or linguistic reasons; but also revealed a world of technical complexity that goes into making fonts look good, especially for complex writing systems such as those of Asia and the Middle East.



Our two speakers were unknown to each other before being introduced by Conrad Taylor, who introduced and chaired this meeting.

Bruno Maag is the owner of a small but vigorous 'digital type foundry' in South London, Dalton-Maag; **Peter Lofting** is an electronic publishing and database consultant who is expert in a number of Asian typographic systems and has also undertaken several research projects on the structure of Asian writing systems for the Unicode consortium.

Why make faces?

Conrad started by pointing out that typefaces are not an endangered species. Agfa have announced a commitment to add 150 new faces each quarter to their libraries. With so many commercial faces available, why might you wish to 'roll your own' or commission a type designer to do it for you? He suggested the following possible reasons:

- **Corporate identity:** typefaces which are the sole property of the company employing them can be a powerful part of a corporate identity scheme. (Bruno later described such a project.)
- **Cost-effective installation:** with major type vendors quoting £60,000 or more for the right for a company to install a type family on an enterprise-wide basis, owning one's own font design can save money and avoid legal problems (for instance, one can give the fonts away legally to imagesetting bureaux).
- **Supporting script systems which are not richly endowed with fonts:** Agfa's prolixity in font creation is scant comfort to those who work in the scripts of Asia, Africa and the Middle East. (Peter later described the creation of a Tibetan font for the Government of Bhutan.)
- **Extending the character set of existing faces:** while some type families such as Caslon, Garamond and Minion possess 'expert sets' that allow a user access to true SMALL CAPITALS, or non-lining numerals such as 0123456789, there is still scope for bringing these benefits to other faces, and adding diacritics which are not part of the standard character set but are required, for instance, for setting in Čzech or Việtnamese.
- **Symbols** *e.g.* for timetables, directories, diagrams or maps are often handled more conveniently if available as a font. That way they work better in tables, may be used in almost any DTP or word-processing program, and consume less storage capacity.

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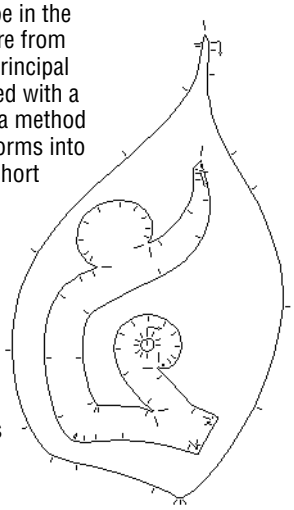
Bruno Maag talked us through the design decisions and technical processes involved in producing National Westminster Bank's corporate fonts, from an original design by David Quay and Freda Sack, on commission from Wolff Olins. This sampler shows the 3 serif display faces and 3 sans-serif text faces in the family.

Since the birth of digital type in the late 1970s, IKARUS software from URW has been one of the principal tools of type designers. Used with a graphics tablet, it provides a method of fast digitisation of type forms into a vector format defined in short arcs.

Left: Conrad Taylor marks digitisation points on the contour of a logo designed for the 5th International Conference of Thai Studies.

Right: a screen dump from Ikarus shows Conrad's chosen points around the contour.



■ **Rasterisation:** not all printers can render PostScript symbols—most office colour printers cannot—but if graphics are supplied as a TrueType or PostScript Type 1 font, rasterisation will be performed by the computer system.

Bruno Maag and the NatWest font

Bruno based his presentation around a couple of case studies, one of which was his digitisation work for the current National Westminster Bank corporate typeface, and the other his creation of anti-aliased screen display type for CD-ROMs published by Dorling Kindersley.

The NatWest project was a collaboration with designers David Quay and Freda Sack, who came up with the original concept and drawings, having been commissioned by corporate identity consultants Wolff Olins. The brief was to make a design which would appear both modern and humanist, with warm and friendly qualities, yet still maintaining the authority of the bank.

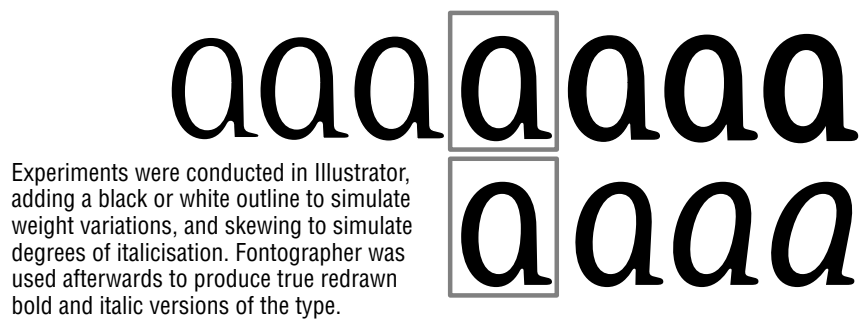
The design process was an iterative one. At first David and Freda created five alternative draft designs, and drew up a few letterforms by hand for each. Bruno digitised these using a graphics tablet and IKARUS software on the Macintosh, and the trial font was tested in a number of design situations. After research and testing, one of the designs was selected by all parties as that closest to the requirements of the brief. In essence this variant possessed all the main features of the final version: no sharp corners anywhere, very rounded forms, unique tapered stems and so on.

The design then went through an improvement process in which curves were tightened around the terminals of serifs; and greater harmony of design was achieved between all the letterforms. Bruno commented that the curvaceousness of the design added to the difficulty in digitising it.

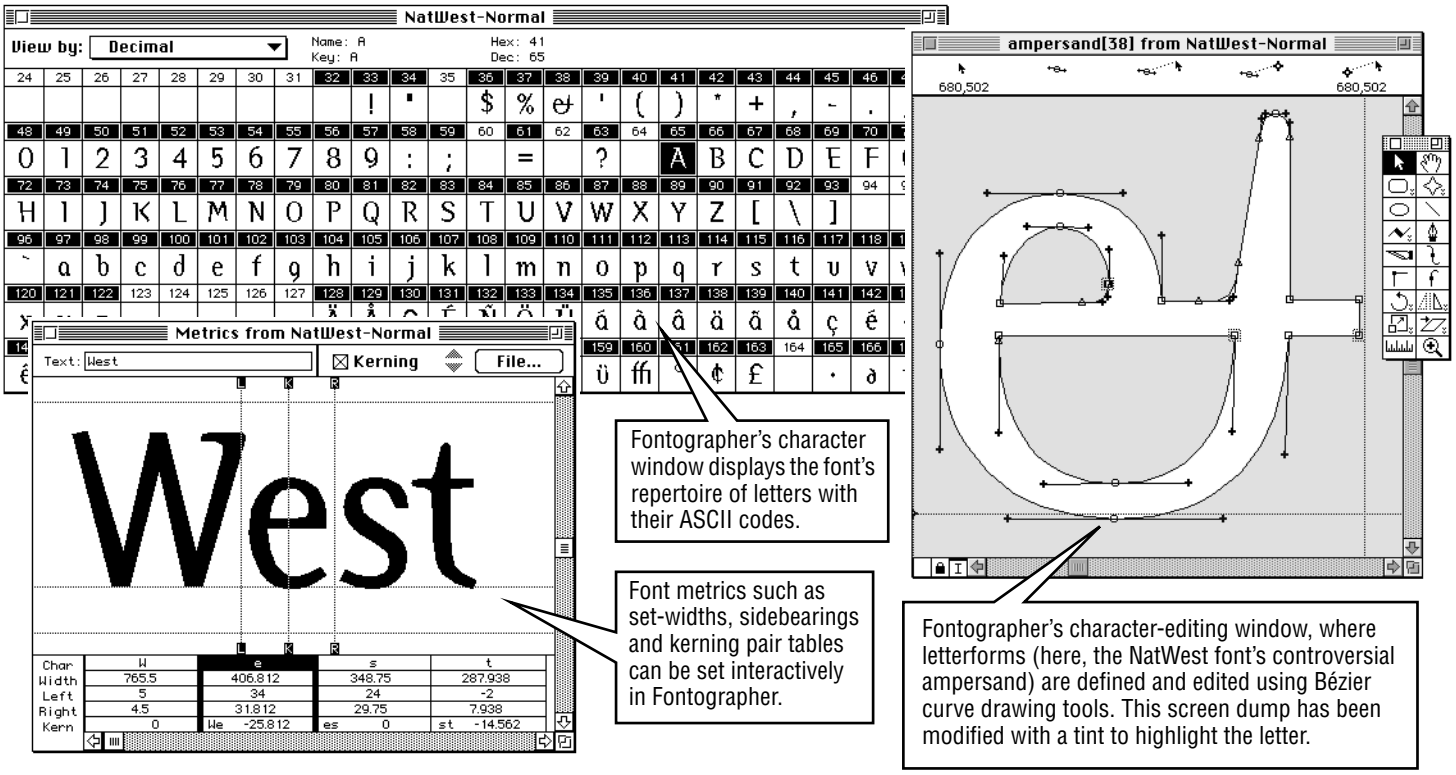
A growing family

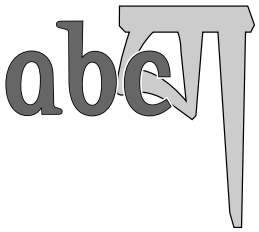
Having produced a complete font for the basic weight, the next step was to add a bold and a light weight. Crude experiments were conducted using Adobe Illustrator software, adding outlines of either black or white to sample settings to see what degree of contrast would be appropriate (*see bottom left*).

Once the degree of contrast had been determined, Bruno produced a true redrawn bold and light weight using Fontographer software. He is keen to point out that once initial pencil sketches were digitised into the computer, all subsequent design and redesign was done on screen. Once the three weights were available, they were tested together in a variety of design situations, and this time the consensus was that the light and bold were fine, but that the basic roman was not sufficiently heavy to be distinguished from the



Experiments were conducted in Illustrator, adding a black or white outline to simulate weight variations, and skewing to simulate degrees of italicisation. Fontographer was used afterwards to produce true redrawn bold and italic versions of the type.





light weight! So now it was the roman's turn to be modified until everyone was happy.

With all these iterations and tests, money was beginning to run out for the project; but the clients felt that these fonts, which had been intended primarily for display typography, should be matched by a co-ordinated set of text faces. David and Freda went back to the drawing board and came up with drawings for serif and sans-serif versions of a text face. It was the sans-serif which was given approval, as it contrasted better with the display fonts already created.

In designing this text face, Illustrator was used once again as a rough and ready 'laboratory' to experiment with set-widths. Then Fontographer was used to create the text face, together with its bold and italic variants—which are properly redrawn, not electronically swollen or slanted.

Bruno's toolkit

Turning to the topic of his work environment, Bruno spoke of the relative merits of IKARUS and Fontographer. IKARUS software made its debut in 1976 on Digital Equipment workstations, and many type vendors such as Monotype used it to convert their existing libraries of type drawings and Rubylith stencils into digital form.

IKARUS works with a graphics tablet and five-button digitising puck, which the type artist uses to enter the co-ordinates of carefully selected points around the outline of the drawn letter-form. The software automatically interpolates pairs of simple arcs between the digitised points.

Bruno considers IKARUS to be the best tool for capturing designs which exist as pencil drawings such as David's and Freda's, but is scornful of the quality of PostScript type data it produces. Once he has captured the data and made some initial corrections in Ikarus, he converts the font to PostScript and then opens it in Fontographer.

Fontographer has an excellent reputation as a tool for creating PostScript and TrueType fonts. In spirit it is closest to the pure PostScript model: segments of letterforms are made and manipulated as PostScript's Bézier curves rather than IKARUS's arcs or TrueType's quadratic splines.

Revealing secrets of the art of type digitisation, Bruno showed that good design requires careful selection of digitisation points. The 'extremes' of curves (the highest and lowest, furthest left and furthest right points) should always be digitised explicitly. Not only does this make it easier to perform set-width and kerning calculations; it is essential for the process known as 'hinting' whereby the algorithms for rasterising outline type forms are modified to give better results of low-resolution printers (such as laser printers).

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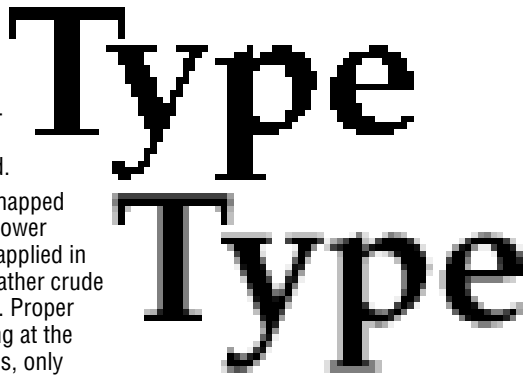
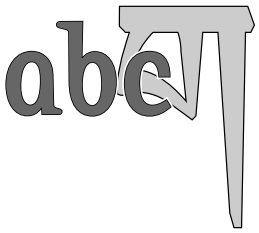
Lush with ligatures: as shown in the setting below, the NatWest font includes additional ligatures for **ff**, **ffi** and **ffl** as well as the standard **fi** and **fl**.

Anti-aliased type is supposed to improve the legibility of type on a TV or computer screen by rendering the edge pixels in shades intermediate between the colour of the type and of the background.

The example above shows bitmapped type without anti-aliasing; the lower example has had anti-aliasing applied in Photoshop. This, however, is rather crude and appears blurred on screen. Proper anti-aliased type has no blurring at the edges of verticals or horizontals, only along diagonals and curves.





The business model

Bruno confirmed Conrad's point that it is common for type vendors to demand fees of around £60,000 for a corporation-wide licence that would permit the installation of a font on all the machines in the company. He estimated that for this sum he could design and digitise about twenty weights of a font. And when you own your own fonts, you are free to do with them as you please; you can even sell them if you want.

In some cases, Bruno has offered clients another contractual model. Rather than assign copyright, Bruno has retained it, offering the client an exclusive licence for a fixed period of time—say, five years for £15,000. This licence can be renewed until the client gets tired of the design.

A snag with this latter model is that Bruno's work in this field has often come through one of the large corporate identity design groups who are handling the client. As Bruno points out, most small designers know that you often have to agree to sign off your copyright to the big design agencies in order to get the work.

Designing type for the screen

Bruno also presented another project, technically very different. Dorling Kindersley asked him to make **anti-aliased bitmap fonts** for use in their CD-ROM publishing projects. Anti-aliased fonts can improve legibility of type that has to be read from a computer screen.

In Bruno's view, the ideal situation would be to create type from scratch for use on a computer screen: it is not appropriate to take traditional serif designs such as Garamond or Trajan and coax them into performing better on the screen through anti-aliasing tricks. But Peter Kindersley has a preference for the traditional book faces, used in the paper versions of the publications; and he sought a high degree of fidelity to the typography of the books in the on-screen versions.

The first Dorling Kindersley project on which Bruno worked was their highly popular *Man of War* publication. This required the production of screen-readable Garamond roman and italic, in 12 pt and 13 pt, plus a range of titling weights. In practice, the designers make up screens in QuarkXPress using these screen fonts, then bring these screens into their PC-based multimedia authoring environment.

A grey area

'Larger sizes are not a problem to anti-alias,' said Bruno. 'You have more pixels to play with at the edges. But you have a real problem with small sizes, especially if you try not only to improve legibility but also retain the integrity of the type design from which these fonts are derived.'

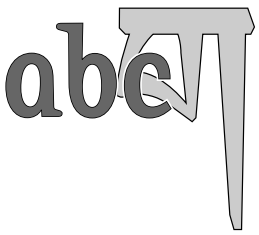
Anti-aliased font design is an exotic area of practice, where Bruno had to learn as he was going along. He worked in Letraset FontStudio: not his favourite tool, but the only one which can produce greyscale bitmaps at the present time.

At first he used 16 shades including black and white and 14 shades of grey between, but later found he got better results by using just ten levels in total. This improves the clarity and strength of the face on screen, though it can compromise the integrity of the original type design. Another benefit of using only ten grey levels is that this releases more colours for multimedia artists to produce pictures with. A typical DK project requires fonts in red, blue and black, claiming 30 colours from the system palette's range of 256.

In addition to anti-aliased fonts for 'freezing' into CD-ROM page graphics, Bruno was also commissioned to make a one-bit (pure black and white) 'live' screen font for interfaces in which the user types into a computer dialogue such as a search box. Peter Kindersley again wanted a serif design. Once the bit-map font had been designed, DK requested a printer font to match it—the reverse of normal practice, in which the outline font for the printer is designed first, and bit-maps are created afterwards to represent them on screen.

Questions to Bruno

When Conrad asked for questions to Bruno's contribution, it showed up a split often apparent in our membership between those interested in details of how things get made, and those for whom this is 'mere mechanics.' Many wanted to put Bruno on the spot for how the font related to NatWest's corporate identity—missing the point that Bruno was the most technical of a *group* of



collaborators working through an iterative design process managed by Wolff Olins.

One person asked whether they had considered creating a Multiple Master font instead of three weights. (Adobe's Multiple Master font format lets a font designer create extremes along an axis of weights, with a given weight being produced as a 'instance' interpolated somewhere along the axis of possibilities.) Bruno said he had suggested it as an option, but the idea was rejected; firstly because designers are often not technical enough to know how to use a Multiple Master font, and secondly because of a desire to prevent the corporate identity from being improvised on!

A discussion arose about why the 'live font' for Dorling Kindersley had to be black and white, not anti-aliased. Whereas greyscale fonts can be used live on the Mac, it involves trickery; it is impossible on the PC; and when colour is set on colour, no application or operating system can cope with that situation 'live'.*

Peter's Four Big Ideas

In the second half of the evening, Peter Lofting rose to speak and wrote the names of four people on the whiteboard: *Magritte, Mead, Patel, Kuhn.* These people have contributed four ideas which Peter wanted to consider in relation to type.

He gave us a rendering of **Magritte**'s famous picture of a pipe with the inscription *Ceci n'est-pas une pipe.* Of course it's not a pipe: it's a visual representation of one. Whereas, said Peter, he could have created a painting of a letter A and captioned it *This IS a letter A*! This, said Peter, is the spooky quality of type: it's A-ness is right there, it is not a representation of some other A.

George Herbert Mead was a psychologist in the Chicago School of Psychology in the 20s and 30s, whose idea about the evolution of language, signs and symbols is called 'symbolic interaction-ism'. His basic premise is that as humans evolved, they came to perceive sounds and activities in the environment as significant of something about to happen, and abstracted these into sounds and gestures which could be made to signify these same things. His relevance to our work in typo-graphy and design, suggested Peter, is that we are still in the process of creating new significances in a living and organic way.

Aurabind Patel is a type designer who has worked on type design for *The Times*; Peter quoted him as saying, 'God is in the details.' (Maybe he did—it's just that the architect Mies van der Rohe said it before him.)

Type, said Peter, absorbs thousands of pounds' worth of effort, yet you hardly see the changes, they are so small. (*Oh, yes you can*! came the pantomime response from the crowd. After some hubbub, we agreed that you *can* see differences, though on investigation the changes made may be subtle.) 'Tiny changes add up on the printed page because something like tightening of the curves on a serif add up to a major impact when you see a page of the stuff.'

Thomas Kuhn (in *The Structure of Scientific Revolutions*) proposed that scientific theory works within an established 'paradigm' shared by all workers in the field—bar a few heretics, perhaps, who sometimes turn out to have a more convincing account of how things work, so that a paradigm shift occurs and the workers in the field coalesce around a new consensus.

Paradigm shifts, baseline shifts

In type design, said Peter, we have had a massive technology shift, but not a paradigm shift to suit. When type vendors converted libraries of metal type designs into photocomposition, the spatial limits of metal type were carried forward into the new technology, though it is true that photo-composition now allowed type forms to be set tighter, to kern at text sizes and even to touch or overlap. But letterforms have still been conceived of and designed within a rectangular bounding box, and anchored to a baseline.

Why not move to a new view of type that is free from the baseline? If we accept that we can define 'kerning pairs' which nestle closer together horizontally (for instance, to get a letter **o** closer to the letter **T** that precedes it, as in **Tom**), why not also specify a vertical adjustment?

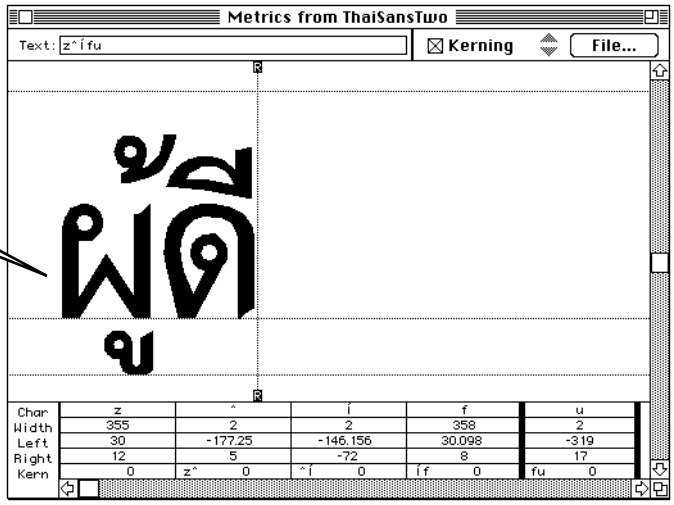
Over four centuries, users of Latin character sets came to accept that the conventions of the scribe (with many variations of letters to accommodate each letter to its neighbours) can be rejected in favour of a much sparser character set without such subtlety. When Gutenberg created his character set for the Bible, he had to make nearly 300 type forms to accommodate the many ligatures and context-dependent versions of letters which were required within the paradigm of letterform-handling he was operating in. Over the centuries, ligatures were dropped to make printing easier—and we've got used to it.

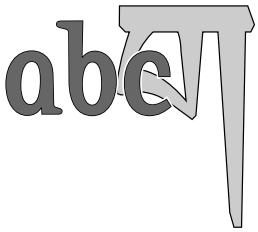
* The specialised exception is the live anti-aliased type which is produced in computerised character generators for television, for instance for titling and subtitles overlaid on moving images. (Example: Aston Electronics.)

Not too dissimilar to the Tibetan script is Thai, which stacks glyphs to a maximum of three deep.

This view of Fontographer's Metrics window shows a sample setting of the phrase '*phu dii*' (person of noble character). The consonant pho **has a vowel** sara uu **under it and a tone marker** mai to **above it; this grouping is followed by the consonant** do **with the vowel** sara ii **above it.**

As the metrics data at the bottom of the screen shows, this stacking is achieved by giving the vowel and tone marks a near-zero width and negative offset. But the situation for Tibetan is even more complex than this…





The calligraphic tradition

In non-Latin traditions, outside Europe, this is not so. Arabic and Indian visual cultures are in a situation similar to that in which Gutenberg was operating, in which readers have expectations about script based on the spacing and letterform variation that calligraphy can achieve. Those whose job it is to create machine-settable type for these communities must bear this in mind. 'You cannot chop up the curly bits,' said Peter. 'You must abandon the idea of a baseline and discrete letter units, and start to look at the behaviour of scripts and shapes from first principles.'

Tin soldiers of Empire

Technology has been exported from Europe for centuries; typesetting is no exception. Metal-based technology was adapted by the big type businesses for many economically significant non-Latin scripts. Almost always it involved a distortion of letterforms to suit the technology: a Bed of Procrustes for the calligraphic tradition.

Fortunately, the PostScript standard and the availability of design tools such as Fontographer have restored to designers native to these calligraphic traditions the ability to create typeforms free from the metallic rigour of spacing imposed by Gutenberg's technology.

Computer interfaces allow us to mix script systems in typesetting: Peter showed an example of English mixed in with right-to-left Arabic setting. And he pointed out that companies such as Monotype and Linotype who once had a monopoly on systems for setting the scripts of South Asia and the Middle East have lost out as Asian publishers have put together their own systems based on DTP technology.

'Electronic Letraset'

Showing some Arabic display typesetting, Peter called this the 'electronic Letraset' paradigm, where a word is formed out of letter elements. When European designers first made type for Arabic, Urdu and related languages, they had to follow this model. In the process, letterforms were distorted into the *Naskh* script system in which all components align parallel to a baseline.

However, *Naskh* is largely rejected in Pakistan in favour of the traditional *Nastaliq* script system, in which the initial element of a word is written high on the right, with lettering descending at a variable angle in a calligraphic sweep and ending low on the left. This is a challenge for typesetting systems; artwork for many Pakistani books and newspapers continued to be written by hand.

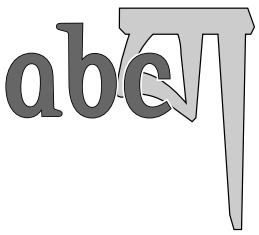
Now a new generation of sophisticated software such as al-Diwan's *al-Nashir al-Sahafi* is capable of generating good Nastaliq script, justifying columns by the preferred method of lengthening ligatures rather than messing about with spaces, and placing *harakat* vowel marks and other modifiers in appropriate juxtaposition to the flowing line of the consonants.*

The Bhutan consultancy

Peter described a project initiated by the Government of Bhutan, who wanted a Tibetan typesetting system for the national newspaper. Tibetan is a left-to-right script in the same family of scripts as Hindi, Bengali, Thai and so on; but has a great deal more complexity in how glyphs†

* Information about Naskh, Nastaliq and al-Nashir al-Sahafi supplied by your editor.

† 'Glyph' means a written or printed mark used to represent a character; but some script systems have multiple alternate glyphs for some characters such as vowels.



are stacked vertically. It is not uncommon to have elements stacked four deep. (There are rare cases of stacking elements five or six deep, but these tend to be in monastic texts.) Peter compared the way these bits get assembled together as like writing out a mathematical equation. His research identified over a thousand vertical combinations of these glyphs.

'Once you let go of the baseline, you have to get to grips with the interdependencies of all the graphic elements; it is a real challenge to make sure that these appear good to the users of these scripts, yet remain modular so we can use them conveniently in a typesetting system.'

Interpretation and consultation

When you create type for a script which has never been set in type—or at least, not to the satisfaction of the script's users—you have no previous sharp model to base it on.

There *have* been Tibetan faces created before: Peter showed us 'the Calcutta Face', produced in Germany at the turn of the century. Through decades of use it became a *de facto* standard, though a poor one. Many stroke widths and tapers do not conform to the calligraphic model. There are even artefacts where the punch-cutter's file damaged the punches!

The alternative is to be guided by calligraphy, but the very flexibility and context-sensitivity of calligraphy makes it a very fuzzy model: simply enlarging sample letters, scanning them and digitising them will not do. Therefore an iterative process of consultation with calligraphers was essential to develop a consensus where one had never been so strictly required before.

The relationship between glyphs got too complicated for Peter to keep track of in his head, so he wrote a database application for this purpose. The process of discovering norms for Tibetan involved interviewing many calligraphers, interpreting their guidance into computer drafts of glyphs, and going back to them for their comments in an interative way until a consensus emerged about how each element look and how each should be handled in relation to the others.

Peter's database application used a co-ordinate system to keep track of glyph placement, and generated custom PostScript to produce print-outs of glyph combinations. In consulting with native calligraphers it was important to generate trial print-outs to a precisely determined scale, so when they scribbled on top of the worksheets Peter could take a pair of dividers and determine the new co-ordinates which were being thereby requested and feed them back into the database.

Technical trickery

Technically, the vertical stacking behaviour was managed in PostScript by having the system create a blank spacing character which claims the gap required to set a stack of glyphs, and moves the cursor location and co-ordinate system to the right of that space; all the visible glyphs were then created in the font with zero width and a negative offset so that they would all compile together in the empty character space. (*See figure on page 17 for an example of this trick in Thai.)*

This is a good example both of the flexibility which the PostScript systems affords, and the ingenuity which must sometimes be employed to implement some of these script systems.

Translating Tibetan into a type encoding scheme was quite a challenge. Amazingly, all the variants for Tibetan can be fitted into an 8-bit encoding, based on the Arabic encoding for Macintosh. The Tibetan script system was built as an Apple Macintosh Script Manager application, with alternative keyboard layouts to match the training and background of various users.

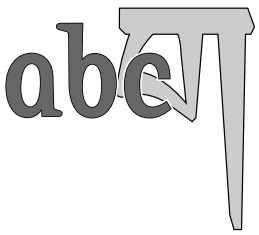
The Script Manager analyses keyboard input and applies contextual mapping of keystroke codes to pull the correct alternative forms of consonants, dependent vowel glyphs, punctuation, honorific marks and so on into the required vertical stack.

Even in the Macintosh Finder, script systems can be mixed: files and folders could also be named in Tibetan. 'It was planned to translate all menus into Tibetan, but translating a command such as *Empty Wastebasket* into Tibetan resulted in quite a long sentence!'

Peter is aware of the danger that is posed by getting a Western consultant to design an Asian typeface—he related how Adrian Frutiger's 'cleaned up' version of the Devanagari script was judged unusable by his Indian clients.

Q & A on Unicode

Peter Mayer asked what progress was being made to bring this kind of multi-script ability to the much vaunted Information Superhighway. He thought it ironic that many Russians of his acquaintance were forced to communicate on the Internet using 'Romanised Cyrillic' instead of their own character set. In reply, Peter Lofting briefly described the Unicode system, which is an emerging standard for the encoding of all the world's character sets within a single two-byte numbering scheme.



Our current system, which uses one computer byte to encode each character, can describe only about 240 possible characters. To accommodate the computing needs of different languages, about 500 such incompatible encodings have been developed. The Internet in practice recognises only one: the impoverished repertoire of '7-bit ASCII', which gives only 92 characters.

The Unicode proposal was to assign two bytes to each character,offering 65,000 encoding slots, which they thought should be enough for all the world's character sets (about 14,000 of these are required for the ideograms used in Chinese, Japanese and Korean). In practice an extension to Unicode may be required, as research indicates that to accommodate all the world's character sets will require more than two bytes.) The Unicode standard is currently being developed by the Unicode Consortium; Peter himself has been employed as a consultant by the Consortium to research the encoding requirements of Mongolian, Khmer and Sinhala.

In Peter's view, there are commercial pressures in favour of Unicode's wider acceptance; at present, however, Windows NT is the only operating system to which Unicode is native. It is in China, Japan and Korea that the pressures to adopt Unicode are naturally strongest.

A member of the audience objected that the concept of a 'character' is itself a Western construct which cannot be foisted on script systems like Chinese; but Peter insisted that there would have to be *some* sort of common encoding scheme: the future of type is clearly digital, and whatever scheme type ends up in will have to have numbers underneath it.

Characters and glyphs

Fred Eade commented that he was surprised that there seemed to be fewer constraints and compromises in taking a calligraphy-based script into type than he had thought, and asked further about languages such as Khmer where he was aware that a great deal of context-sensitivity determines which alternative form and placement of a glyph is appropriate for the representation of a particular character. How persuaded was Peter that the technologies available would make the right choices in these circumstances?

Conrad Taylor pointed out that 'characters' are one thing and 'glyphs' are another, and what such circumstances require is a set of rules which map character sets onto glyph sets taking context into account. At a primitive level this already exists in DTP software such as QuarkXPress and FrameMaker which automatically display and print the **fi** and **fl** ligatures even though they are encoded as separate characters in the computer's 'backing store'.

(Apple Computer's recent system extension, **QuickDraw GX**, offers automatic glyph substitution facilities for use with fonts with very large 'glyph palettes' of ligatures and swash forms. Such fonts can be created either as TrueType GX or PostScript Type One GX. Only two DTP programs are supporting the GX standard—*UniQorn* and *ReadySetGo*—but this extension of the capabilities of the operating system may prove to be more significant in Asia.)

More than meets the eye?

Peter Lofting proposed a kind of 'Turing Test' for typesetting systems whereby the trained eye of a skilled user of a script system—a scholar or priest, say—can be the final arbiter of whether the system is good enough.

(Note that both speakers stressed the importance of collaboration between the typographic technician or programmer and the readership who will use the typesetting system's products.)

Serious about type

In his closing remarks, Conrad Taylor referred to an article by Judith Wusteman in the newsletter of the British Computer Society Electronic Publishing Specialist Group. She had reported on the FUSE 94 typographic conference and workshop, the designers present at which seemed interested chiefly in taking liberties with letterforms as a medium of expression. In contrast, this brief meeting of the Information Design Association covered a vast amount of complex ground and peered into some deep questions of just what type is, how it is made, and how we can work with it to enhance clear communication and corporate style in the modern environment—whatever our language. ■

Bitstream has technology worth watching

Bitstream Inc. of Cambridge, Massachusetts was once able to describe itself as the world's largest independent 'digital type foundry'. Its fortunes have declined recently, but it has made a reputation for innovation in some areas discussed in this meeting report. ¶ For instance, it has created a font with a huge character set—UNICODE-encoded—which could support multilingual document exchange; it has started to manufacture TrueType-format fonts for the new 652-character-set standard which Microsoft is implementing in Windows 95; and its TrueDoc technology for embedding fonts in electronically-transmitted documents (licenced by Novell and Common Ground) supports non-Roman character sets. Version 2.0 of TrueDoc even supports anti-aliasing.