Sylfaen : Foundations of Multiscript Typography

INTRODUCTION

In the autumn of 1997, I was hired by the Microsoft Typography Group to consult on the production of support materials for OpenType font developers working with multiple scripts and languages. The project was given the working title Web Resource for International Typography (WRIT). A year later, I had the pleasure of showing this work in progress at the 1998 ATypI Conference in Lyon, where it was well received by my colleagues in the type industry. Shortly after my return to Canada, Microsoft decided to put further development of this work on hold, so this paper, inevitably, lacks some of the enthusiasm I had for the project in 1998. It is difficult to remain excited about something which has been effectively cancelled, but at the same time I am happy to respond to the editors' invitation to write something about the project for the *Type* journal, because I think the small team at Microsoft who worked on this project achieved something important. Perhaps I still hope that some day the project may be revived, even if in a different or more limited form. Certainly, I still believe that the ever increasing emphasis on internationalisation in software development, business and, of course, the Internet, requires a better level of support from font developers, and this in turn requires something like WRIT.

The Web Resource for International Typography is a database of glyphs mapped to languages, scripts and typographic features that, in turn, are mapped to geographic regions, countries and geopolitical organisations, and to existing standard character sets. The database is searchable through a scripted, server based interface which compiles results in the form of custom character sets in response to user defined criteria. For example, a font developer could select a number of languages from the database, and

For a general introduction to OpenType, see David Lemon's article in the first issue of *Type*. For more detailed information, including the current version of the OpenType specification, see the Microsoft Typography website at: *www.microsoft.com/typography*

generate a list of required characters for a font to support those languages. Search criteria can be mixed to generate a character set to support some specific languages, official and minority languages for particular countries or regions, and one or more existing codepages for different operating systems. [fig.1]

OpenType enables the development of fonts with extensive, flexible glyph sets supporting many languages in multiple scripts, but if type designers and manufacturers are going to make such fonts, and make them to a high level of quality matching their best Latin script fonts, they need information about those scripts and languages. There are people who hold the view that it is in some way impossible for a non-native speaker to design good typefaces for a language. At the very least, they claim, the type designer should be able to read and write the language in question. It is certainly true that there are many examples of fonts which suffer from the designer's lack of familiarity with the particular typographic traditions of foreign scripts, but there are also a great many historical examples to repudiate the general view. There are examples of type designers who excelled in designing type for language they could not speak or read and who, in many cases, exceeded the achievements of their native colleagues. Perhaps the most dramatic example is that of the Indian punchcutter Ranu Ravji Aaru, who cut celebrated original types for many of India's scripts and languages during the late 1800s,
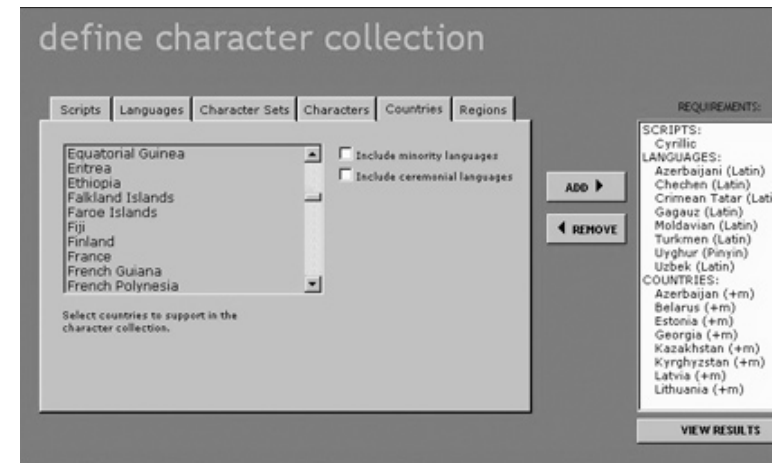
[1] Entering search criteria in
WRIT, top, and viewing query results, bottom.

despite being illiterate *even in his own language*.[1] This clearly suggests that the kind of knowledge a type designer needs to successfully design for foreign scripts and languages is not linguistic knowledge.

It would be difficult to precisely define the necessary knowledge to enable such work, in part because the requirements themselves will vary from script to script. A Latin type designer will find a good deal of his experience can be directly applied to the design of Cyrillic typefaces, but much less of what he knows will be relevant to the design of, say, a Tibetan font. A general first rule would be to never presume that what you know about making Latin typefaces can be applied to another script. Some of the least successful examples of non-Latin types—Eric Gill's Perpetua Greek, for example—clearly demonstrate the error of trying force the typographic conventions of one script onto another. Every script has its own traditions, whether they are inscriptional, manuscript or typographic, and these traditions need to be interpreted in new designs.

Early in the development of WRIT, at the very first planning meeting in fact, it became clear that the work would have to involve the production of a new font, which I would design in collaboration with Geraldine Wade, a Monotype employee working on OpenType font development for Microsoft (Geraldine now works directly for Microsoft, doing very clever things with controlled subpixel display of type on lcd screens). We needed a font which would display *normative* forms of each glyph in the database, so the user would not only have technical information about the glyph—character codepoint, PostScript name, glyph to character mapping, required or desirable OpenType layout features, etc.—but would also have some idea of what the letter or symbol might look like in a single, fairly neutral style. The neutrality of the design was important, because we wanted to avoid making overt suggestions about the application of particular typographic styles.

A few weeks after that first meeting, I presented Geraldine and Simon Earnshaw, the project manager and designer of the WRIT tool with my first designs for the Latin upper and lowercase letters of what would become the typeface Sylfaen. The name Sylfaen, which provides the pun in my title, is a Welsh word meaning *foundation*. Since Geraldine and I were both raised in Wales,

it seemed appropriate to pick a Welsh name for our joint typeface: to insist on the continued importance of the heritage of a particular place, even as we set out to make a font for many places. What we were hoping to do, after all, was not to homogenise different typographic cultures, but to identify and record the vital elements of each, to balance the international and the local.

Sylfaen is both less than a typeface should be and more than most of today's fonts typically are. Despite having assumed a life of its own (a subset of the font is being released with Microsoft's Windows 2000 operating system),
Sylfaen is very much an unfinished project. There is much in the design which Geraldine and I would have improved, if we had been given the opportunity, much that we would have added, and much that we did design that may never see the light of day. There is only one weight, in one style—no italic, no bold—, and not a kerning pair in sight. What Sylfaen does have is 3,842 glyphs supporting more than seven hundred languages written in six scripts, plus International Phonetic Association (IPA) notation and extensive numeric and symbol sets. Support for these languages is not limited to plain text processing; a fairly high level of typographic sophistication is supported through smallcaps, extensive ligature sets, and variant forms.

LATIN
I began the design of Sylfaen with the Latin script (I began work on the Cyrillic letters while the Latin was in progress, see below). One of the characteristics of the whole WRIT project was the speed at which Geraldine and I were obliged to work. At the same time as designing and making the outlines for the thousands of glyphs in the font, we were also busily identifying languages for inclusion in the database and researching their orthographies. This left very little time for review of the design, and most of the glyphs only underwent a single set of revisions. Knowing that we would need to work quickly, I began the design by adapting the outlines of Symposium, a slab serif text face I have been working on sporadically for the past four years. For Sylfaen, I altered the proportions of the letters, changed the shape of the serifs, and introduced a slightly different stress to the bowls and counters. [fig. 2] These changes immediately suggested

AA BB CC DD EE
FF GG HH II JJ KK
LL MM NN OO PP
QQ RR SS TT UU
VV WW XX YY ZZ
aa bb cc dd ee ff gg
hh ii jj kk ll mm nn
oo pp qq rr ss tt uu
vv ww xx yy zz

[2] Comparison of basic letterforms in Symposium (left) and Sylfaen (right).

others—the shape of the lowercase a, for example—which were quickly incorporated into the new design. I worked, as is my habit, directly on the computer, only resorting to sketches on paper when I wanted to quickly explore different possible solutions for a particular letter. I find a pleasing immediacy in designing directly in the font manfacturing software: working with the means of production rather than being separated from them by distinct design, digitisation and manufacturing processes.

It is commonly misstated among English speakers that the Latin alphabet has 26 letters, but I'm not sure that anyone has yet made a complete count of the actual number of letters that are required to write all the languages that use the Latin script. The script has been adapted to represent hundreds of languages, many of which have added letters to the received alphabet to represent sounds which do not occur in the language—usually that of a colonial power—from which the alphabet was learned. I am not talking here only of diacritical letters, those marked for accent, tone or nasalisation, but of basic letters in the orthographies of languages as diverse as Azerbaijani, Yoruba and Vietnamese. The modern Vietnamese orthography is probably the most complex implementation of the Latin script. It is based on a system codified by a French Jesuit scholar and missionary, Alexandre de Rhodes, in 1651, and the basic Vietnamese alphabet consists of 37 letters. Additionally, the eleven vowels can be spoken in six

different phonemic tones, which are indicated in text with a system of diacritic markers. A fairly simple Vietnamese text may easily require in excess of 80 letters. [fig.3]

By the beginning of the summer of 1998, work on the WRIT database and on Sylfaen was progressing well, but I was troubled by the fact that most of our Latin script language coverage was limited to European languages. We had collected information on major languages from East and South East Asia, such as Vietnamese, Malay, and the pinyin system of Chinese transliteration, but we had little or no information for languages in many other parts of the world. The Latin script has been adapted, most often by linguists, missionaries and Bible translators, to reduce the literature of many oral cultures to writing, in all parts of the globe. I knew that we could not hope to over all these adaptations in the first version of WRIT, but I hoped we might at least map out the use of the Latin script in one other continent. I chose Africa, partly because I already had some information of the most widely spoken African languages, and because Africa is linguistically one of the richest areas of the world. Approximately one third of all the world's languages are African and an increasing number of these languages are being written in the Latin script. I spent a week researching modern African languages in the excellent African Studies Library at Northwestern University in Evanston, Illinois, and compiled data for more than two hundred African languages. This is only about 10% of the total number of African languages, but covers all the languages spoken by more than one million people or with some official status in African states.

When I sorted through this information on my return to Vancouver, I realised that I would have to add some 570 glyphs to Sylfaen, not counting smallcaps. Most of these African languages are tone languages, where vowel tone is sometimes the only indicator of semantic distinction between words spelled the same way. Although most modern African orthographies do not consistently mark tone—unlike Vietnamese, for example—diacritics for tone are sometimes necessary in text to avoid ambiguity and, of course, they are essential for dictionaries, grammars and literacy textbooks. In many of these languages, nasalisation can also be a factor in distinguishing meaning, and sometimes it is necessary to indicate both tone and nasalisation on the same vowel. Many of the orthographies for minority languages have been

developed by linguists working in the field, often using manual typewriters and carbon paper to produce their first grammars, and this has led to great diversity in the representation of tone and nasalisation. In an African context, diacritics marks like the cedilla may assume new uses, quite different from their use in European orthographies. [fig.4]

African typography is still very much in its infancy. With very few exceptions, African countries have not developed their own typographic cultures, but nor are they entirely comfortable with the typographic culture of the former colonial powers. Some African organisations and international agencies have advocated using only lowercase letters, but this seems to have been as much in response to the limits of typewriter and early word processing technology as in rejection of 'unnecessary western european convention'.[2] Certainly, limited access to technology in many areas remains a major problem today. It is technologically sobering for a digital type designer to examine book after book 'printed' with a typewriter on onionskin paper, to which accent marks have been painstakingly added by hand, and to realise that they were published only last year.

IPA
Many of the distinct letters in modern African orthographies originated in the Africa Script, first published by the International African Institute in 1930.

Aa Àà Áá Ạạ Ảả Ãã Ăă Ằằ Ắắ Ẵẵ Ẳẳ Ãã Ââ Ầầ Ấấ Ậậ Ẩẩ Ẫẫ Bb Cc Dd Đđ Ee Èè Éé Ẹẹ Ẻẻ Ẽẽ Êê Ềề Ếế Ệệ Ểể Ễễ Gg Hh Ii Ìì Íí Ịị Ỉỉ Ĩĩ Kk Ll Mm Nn Oo Òò Óó Ọọ Ỏỏ Õõ Ôô Ồồ Ốố Ộộ Ổổ Ỗỗ Ơơ Ờờ Ớớ Ợợ Ởở Ỡỡ Pp Qq Rr Ss Tt Uu Ùù Úú Ụụ Ủủ Ũũ Ưư Ừừ Ứứ Ựự Ửử Ữữ Vv Xx Yy Ỳỳ Ýý Ỵỵ Ỷỷ Ỹỹ

[3] Vietnamese characters in Sylfaen.

[4] A few of my favourite African diacritics from Sylfaen.

p b t d ʈ ɖ c ɟ k g q ɢ ʔ m ɱ n ɳ ɲ ŋ ɴ ʙ r ʀ ɾ ɽ ɸ β f v θ ð s z ʃ ʒ ʂ ʐ ç ʝ x ɣ χ ʁ ħ ʕ h ɦ ɬ ɮ ʋ ɹ ɻ j ɰ l ɭ ʎ ʟ ⊙ ǀ ǃ ǂ ǁ ɓ ɗ ʄ ɠ ʛ
i y ɨ ʉ ɯ u ɪ ʏ ʊ e ø ɘ ɵ ɤ o ɛ œ ɜ ɞ ʌ ɔ æ ɐ a ɶ ɑ ɒ

[5] The basic IPA consonants and vowels in Sylfaen.
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The lowercase form of most of these letters were taken directly from the alphabet of the International Phonetic Association. The Sylfaen IPA set covers the current IPA standard, as well as those obsolete or deprecated characters which remain in the Unicode Standard. [fig.5] The IPA alphabet is a generative notation system, and the basic consonants and cardinal vowels can be combined with almost any of the multitude of floating diacritic marks. This system can accurately represent all sounds which can be made with a normal human vocal system, even those which do not occur in any known language (an extension to the IPA alphabet, not supported in Sylfaen, covers notation of physically disordered speech).

A designer making an IPA font needs to make a decision on how to handle the combining behaviour of these diacritics. Existing IPA fonts use extensive kerning tables to vertically align the diacritics with base letters; unfortunately, of the 800 or so possible combinations, many combinations are unattractive and even indecipherable when rendered in this way, due to diacritics colliding with ascenders or descenders. The official IPA standard addresses this problem by allowing for diacritics to switch position—moving, for example, from below a consonant to above it to avoid colliding with a descender—providing, of course, that the result is unambiguous.[3] This rule can be applied in OpenType through either glyph substitution or glyph positioning lookups. An optimal OpenType solution for IPA might well involve both GSUB and GPOS layout features.

CYRILLIC

I began drawing the letters of the Russian alphabet as soon as I had settled on the basic forms of the Latin letters. [fig.6] Increasingly in my own type design work, I try to work on these two scripts simultaneously, allowing them to equally influence the development of a design. Most available fonts for both the Latin and Cyrillic scripts began life as Latin types and have been 'cyrillised', sometimes well but often badly. The designers associated with the ParaType foundry in Moscow have ably demonstrated

that almost any style of Latin font can be translated into a good Cyrillic type, and I think this term 'translated' is an apt one. As in a literary translation, identifying and preserving that which is essential to the character of the original while, at the same time, respecting and making full use of the traditions and idioms of the target requires a thorough familiarity with both. In type design, this familiarity can only be gained by experience, and this generally begins with having one's first efforts criticised by a true expert. In the design of Sylfaen, and also the other Cyrillic types I have designed, I was fortunate to have my work reviewed by Maxim Zhukov, typographic coordinator for the United Nations. When working with a foreign script for the first time, a type designer really needs to find a qualified reviewer like Maxim, who can bring his own experience to a sympathetic critique of the design. Without such expert advice, a designer could spend many years making the same basic mistakes again and again before learning, from bitter experience, what the expert could explain in a couple of minutes.

The Cyrillic script, like the Latin, is descended from the Greek. These three are the trinity of major European scripts (although they are not the only European scripts): all three share a certain number of basic letterforms in common and derive their alphabetic structures from a common source. The Cyrillic script, like so many other writing systems around the world, was invented by missionaries. In the 9th century, two Greek monks

Ааа Ӓӓä Ӑӑă Ббб Ввв Ѓѓѓ
Ґґґ Ғғғ Ԑԑԑ Ддд Еее Ѐѐѐ Ёёё
Ӗӗӗ Єєє Әәә Ӛӛӛ Ԑԑԑ Ҿҿҿ
Жжж Җжӂ Ӝӝӝ Җҗҗ Ззз
Ӟӟӟ Ҙҙҙ Ӡӡӡ Иии Ѝѝѝ Ӣӣӣ Ӥӥӥ
Ййӣ Ііі Її ї Јјj Ккк Ќќќ Қққ
Ӄӄӄ Ҟҟҟ Ҡҡҡ Ҝҝҝ Ллл Љљљ
Ммм Ннн Ӊӊӊ Њњњ Ҥҥҥ
Ӈӈӈ Ооо Ӧӧö Ѳѳѳ Ӫӫӫ Ппп
Ԥԥԥ Ррр Ссс Ҫҫҫ Ѕѕs Ттт
Ԏԏԏ Ћћћ Ҭҭҭ Ӵцҵ Ууу Ӳӳӳ
Ӱӱÿ Ўўў Ӯӯӯ Ӳӳӳ Үүү Ұұұ
Ффф Ххх Ҳҳҳ Ѡѡѡ Ццц Ччч
Ӵӵӵ Ҷҷҷ Ҹҹҹ Ҽҽҽ Шшш
Щщщ Ҵцҵ Ъъъ Ыыы Ӹӹӹ
Ььь Эээ Ююю Яяя Ѣѣѣ Ѵѵѵ

[6] Sylfaen Cyrillic, uppercase, smallcaps, and lowercase.

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from Salonica, canonised as SS Cyril and Methodius, headed north into the Balkans and then across into Bulgaria to convert the Slavs to Christianity. Saint Cyril, the more learned of the two, is traditionally credited with the invention of the Cyrillic script, which was used to write Old Church Slavonic, the literary language of the Orthodox Church in Slavic lands. In the early 18th century, Tsar Peter the Great reformed the Russian alphabet to create the modern Cyrillic script, removing many of the historical letters and remodelling the normative forms of the others on Latin typefaces of the period from the Netherlands. The Bolshevik government of 1918 introduced further script reforms, removing additional historic letters.[4]

In the 1930s and 1940s, the Soviet government embarked on a programme of orthographic reform in many of the regional republics, replacing existing writing systems with Russian-based Cyrillic script systems and developing orthographies for previously unwritten languages. In many cases, this campaign resulted in the invention of new Cyrillic letterforms and diacritics to represent sounds not encountered in Russian or in other Slavic tongues. For some languages, such as Azerbaijani, this was the second writing reform in less than twenty years. In 1924, the Azeri Arabic orthography had been replaced by a Latin one and in 1940 this was replaced by a Cyrillic system. In 1991, the government of the newly independent country of Azerbaijan formally adopted a new Latin orthography. Speakers of Turkic languages in other former Soviet republics have also officially abandoned the Cyrillic script in favour of the Latin. Many of these republics are now in a state of digraphia, with new Latin orthographies being propagated in schools and official media, while the majority of the population continue to use the Cyrillic script for many daily purposes. This situation is reflected in the WRIT database, as accurately as possible given the changing nature of linguistic politics across the region, by providing both Latin and Cyrillic orthographies where appropriate. In other former Soviet republics in Asia, such as Mongolia, efforts are being made to reintroduce native or traditional scripts, although progress has been slow and the Cyrillic script remains the common writing system for most people.

In addition to designing glyphs for more than sixty Cyrillic script languages, I also devised a set of Cyrillic smallcaps for Sylfaen. Smallcaps have become an essential feature of fine Latin

typography; they are, like italics, one of the ways in which typographers identify and organise different elements of text. Maxim Zhukov has cogently argued that there was no tradition of fine typography during the Soviet era,[5] and the lack of smallcaps for most Cyrillic types is one of the sad results of this. Cyrillic smallcaps perform the same basic functions as their Latin counterparts: they reduce the disturbing effect of massed uppercase letters in abbreviations and acronyms, and they set apart subheads, running titles, etc.. I only know of one example of Cyrillic smallcaps from the Soviet period (I hope there might be others)—Nikolai Kudryashov's admirably complete Encyclopaedia type family of 1954[6]—but circumstantial absence should not be confused, as it sometimes is, with tradition. If a typographic tradition is going to be a living tradition, its practitioners need to look at how it can best communicate, as a system of signs and as an organising principle. Nothing should be rejected out of hand, even if it is not the way things were done yesterday. What is important to any typographic tradition is that typographers be given the tools they need to make their full contribution to the articulation of the written word.

Sylfaen Cyrillic received an award of excellence in the Kyrillitsa 99 type design competition in Moscow, and a special award for 'outstanding contribution to the development of Cyrillic typography and international typographic communications'.

GREEK
Geraldine Wade designed the Greek portion of Sylfaen, using my Latin design as a starting point. She quickly decided that she wanted to change some elements of the shared uppercase letters to make them better harmonise with the more cursive Greek lowercase. Very often, the same glyphs can and should be used for shared letterforms between Greek, Latin and Cyrillic versions of the same typeface, but I think Geraldine's aproach can be legitimate. A type designer adapting an existing design to another script needs to explore both the commonality and distinctiveness of the two traditions as they apply to this particular style of lettering. The Sylfaen Greek letters, both upper and lowercase, are slightly lighter than their Latin and Cyrillic counterparts, and the shape and weight of the serifs on the uppercase letters are quite different.

Are these necessary distinctions? Unfortunately the schedule of the WRIT project did not permit Geraldine to develop her exploration to a point at which it would be possible to answer this question with certainty, and the Sylfaen Greek set needs to be seen as an unfinished work. As with the Cyrillic, development of the Greek relied on expert advice and review, from Gerry Leonidas of the University of Reading, England, and from Matthew Carter, whose Wilson Greek is an important contribution to the recent and overdue improvement in Greek digital type.

Sylfaen supports two different Greek orthographies (only one of which, monotonic, is covered in the Windows 2000 release). In the 2nd century BC, breathing and accent marks began appearing in Greek papyri, developing into the system which is known as polytonic Greek. Polytonic Greek became the standard convention of writing contemporary and classical Greek around 800 AD, when it became established in Byzantine scholarship. The polytonic system indicates rough and smooth breathing, vowel pitch (tone) and vowel stress, although only the latter is important in modern Greek. Pitch has all but disappeared from the pronunciation of the modern language, and in 1982 the Greek government passed a decree adopting the monotonic system for writing Greek. In this system, the only diacritic marks are those indicating stressed vowels. However, the polytonic system, despite

[7] Sylfaen Greek and, below, case mapping of subscript and adscript iota to smallcaps.

arguments that it is artificial and not representative of modern Greek pronunciation, continues to be used by many quality Greek publishers and, in reaction to the 1982 decree, appears to be making something of a comeback.

In the development of Sylfaen Greek, we were once again faced with the question of smallcaps. If possible, smallcaps have been even more neglected in Greek typography than in Cyrillic. Additionally, the case mapping of smallcaps to upper and lowercase equivalents in polytonic Greek is much more complicated than in Latin or Cyrillic, due to the presence of the *ypogegrammeni* and *prosgegrammeni*—respectively the subscript and adscript forms of *iota* when it follows the vowels *alpha, eta* and *omega*. [fig.7] After discussion with Gerry Leonidas, Geraldine decided to proceed with the design of Greek smallcaps, although we were still unsure exactly what form the subscript and adscript *iota* should take in smallcaps. Matthew Carter came to the rescue with a photocopy of Greek smallcaps in Laurentius de Alopa's 1496 edition of the works of Apollonius of Rhodes. As Frederic Goudy famously quipped, the old fellows stole all our best ideas; these ideas may, however, have been neglected in the intervening five hundred years.
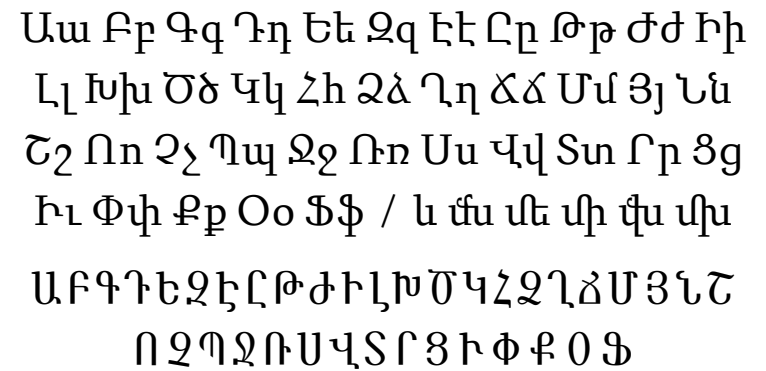
ARMENIAN

The Armenian script was invented around 407 AD, by Mesrop Maštoc, a cleric who wanted to translate Greek and Syriac scriptures and liturgical texts into Armenian. The system he devised is a pure alphabet, closely modelled on the traditional order of Greek phonetic values, with additional graphemes to represent Armenian sounds not found in Greek. The orthography is, phonetically, a near perfect representation of the Armenian language, and has remained almost entirely unchanged since its invention. In recent times, the letterforms in many Armenian typefaces have consciously modelled Latin types in their treatment of serifs, stroke weight and stress, and other details. This is the approach that Geraldine adopted for the Sylfaen Armenian, in order to harmonise the different scripts within the font. This kind of harmonisation has to be very carefully handled, as there is, of course, a point at which one can corrupt the normative letterforms and produce something which will be unacceptable to native readers. Once again, we sought expert review of the design, this time from Manvel Shmavonyan, an Armenian type

designer, and his Russian colleague Vladimir Yefimov at ParaType in Moscow.

Having greatly increased our workload on the Cyrillic and Greek, Geraldine and I decided not to pursue the question of whether there might be a place for smallcaps in Armenian typography. After she had designed the basic Armenian alphabet, however, Geraldine decided to add a set of 'classical caps'. These are based on tall capitals in the rich Armenian manuscript tradition, which descend below the baseline. They are provided in Sylfaen to suggest alternate forms which might be included in an Armenian font with advanced typographic features. The font also includes a set of ligatures that are standard in quality Armenian typography. [fig.8]

GEORGIAN

The Georgian language has been written with two indigenous scripts: khutsuri and mxedruli. At present, Sylfaen supports only the latter, which is the modern literary standard. [fig.9] The older khutsuri script, which belongs to Georgian liturgical tradition, is a bicameral alphabet with upper and lowercase forms. Mxedruli is a unicase alphabet. The Unicode Standard uses the same code block for both Georgian scripts, mapping mxedruli letters to corresponding lowercase khutsuri codepoints. This can be very confusing for designers not familiar with the history of these two scripts and their traditional stylistic variation. An OpenType font designed to support

[8] Sylfaen Armenian, showing the basic alphabet and, below, ligatures and 'classical caps'.


[9] Sylfaen mxedruli Georgian.

both scripts would require glyph substitution lookups using the 'locale' layout feature to associate the correct forms with the appropriate orthography. It may be considered simpler to make two fonts.

Unfortunately, and for tragic reasons, Sylfaen Georgian cannot be considered a finished design. It was being reviewed by the leading Georgian type designer, Anton Dumbadze, when he was struck by a car outside his home in Tblisi and killed. His death prevented further revision of the Georgian design, and has left a great emptiness in the field of Georgian type design. Anton Dumbadze designed all the Georgian typefaces in the ParaType library, and the loss of his expert presence is a significant blow to Georgian font development.

ETHIOPIC

The scripts discussed so far are all European in origin, and all are alphabetic, representing sounds by the combination of distinct consonant and vowel signs. The Ethiopic script was added to the work items for WRIT to broaden the scope of the project in two ways: introducing a non-European and nonalphabetic script. The modern Ethiopic script is a syllabery derived from the writing of the ancient Ge'ez language, and is indigenous to East Africa. Each symbol in the script represents a consonant and vowel combination, and there is a close visual similarity between variants of the same consonant. In the accompanying illustration [fig.10], the four large
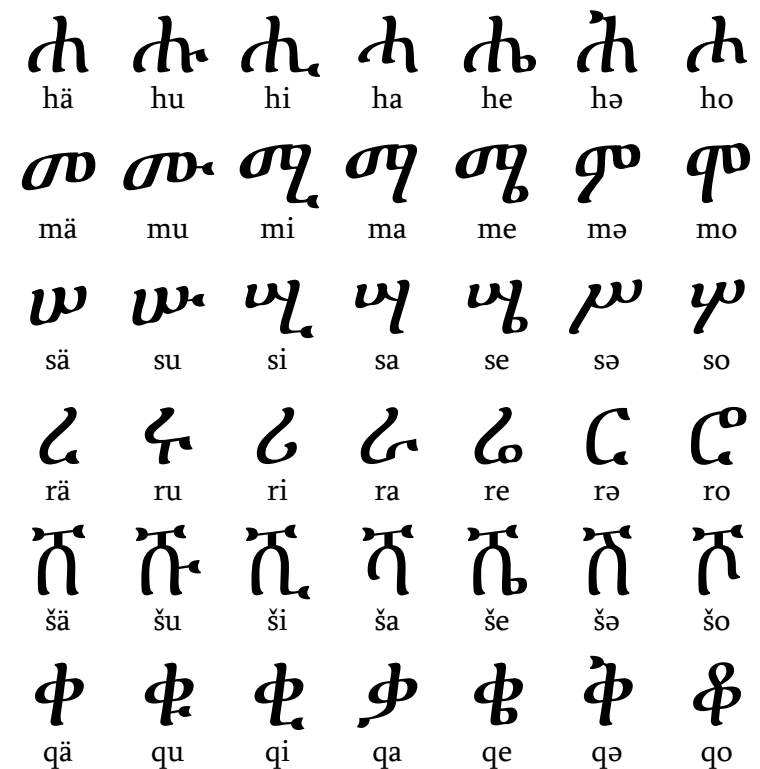
[10] Some of the characters of the Ethiopic syllabery in Sylfaen, showing the systematic visual relationship of consonant and vowel combinations.

characters represent the syllables *ko-ka-ko-la,* demonstrating that the symbols for *ko* and *ka* are based on the same form. Similarly, the short *a* vowel sound is indicated in the same way for *ka* and *la,* by shortening the left stroke of the syllable. The Ethiopic script is used to write more than two dozen modern languages in Ethiopia and Eritrea, and could also be adapted for many other, currently unwritten tribal languages of the region. The major languages using the script are Amharic (the national language of Ethiopia), Tigre, Tigrinya and Oromo.[7]

Ethiopic is a good example of a script whose typographic form has become largely frozen. Today's Amharic newspapers are set in fonts that, like the very first Ethiopic types, are based on 18th century manuscript prayerbooks and hymnals. Most developers of Ethiopic fonts take a conservative approach, and avoid any deviation from the forms encountered in the later Ethiopic manuscript tradition. Geraldine's design for Sylfaen is similarly conservative, although somewhat lighter than other Ethiopic types to better harmonise with the other scripts in the font. In Ethiopic, the importance of unambiguous variation between related syllables, relying as it does on sometimes small but critical differences between otherwise identical forms, encourages this conservative approach to interpretation.

Support for encoding Ethiopic has just been added to the Unicode Standard, and it seems likely, as more digital fonts are made, that designers will start to become more adventurous in their treatment of this script. I have already seen one design which recasts the Ethiopic syllabics in the style of German blackletter, cleverly combining the traditional forms of two great manuscript cultures. It remains to be seen what native users will make of such designs: whether they will be embraced for their playful inventiveness, or rejected as alien impositions.

CONCLUSION

I've tried, in this paper, to suggest some of the decisions and challenges that face designers working in multiple scripts, and to show how they have been addressed in a particular design project. This project was, itself, part of a larger undertaking intended to provide designers with basic information on writing systems and the typographic cultures that use them. It is impossible, obviously, to condense this information into a single article, or to sum up in a list

of universal axioms how designers should proceed in such work. Much depends on the script in question, and on the expectations of the culture or cultures of readers and writers who use that script. If I have a single axiom to suggest as a foundation for multiscript type design, it is this: a writing system is a cultural artifact owned, in a very real sense, by the people who use it and who have inherited it from those who found it worthwhile preserving. As such, all writing systems demand our respect as type designers. As these living artifacts of distinct cultures encounter and interact with the global culture of computer technology, mass communication and international capital, they are unlikely to remain unaffected by the experience. If the rich traditions of these scripts are to survive and enhance the common future of a globally connected world, they will need to find vibrant expression in the context of today's technology.

In concluding, I would like to thank Microsoft Corp. for the opportunity to work on the WRIT project, and especially Greg Hitchcock for getting the ball rolling and Simon Earnshaw for his clear vision of what could be achieved and how best to achieve it. It was a pleasure to work with Geraldine Wade on the design of Sylfaen, and with our expert reviewers, Matthew Carter, Gerry Leonidas, Manvel Shmavonyan, Vladimir Yefimov, Maxim Zhukov and, of course, the late Anton Dumbadze. I would also like to thank Jon Jorstad, who wrote the code for the WRIT user interface, the staff of the African Studies Library at Northwestern University for all their help during my time there, and the many correspondents who replied to Geraldine's and my enquiries about their scripts, languages and typography.

Notes.
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2. Mann & Dalby. *A Thesaurus of African Languages*. Hans Zell Publishers (for the International African Institute). 1987. p.210.
3. *Handbook of the International Phonetic Association*. Cambridge University Press. 1999.
4. For more information on the historic development of the modern Cyrillic script, see: Zhukov. 'The peculiarities of Cyrillic letterforms: design variation and correlation in Russian Typefaces' in *Typography Papers* 1. 1996.
5. Zhukov. 'Towards an open layout : A letter to Volodya Yefimov' in *Type,* Vol.1 No.1. 1997.
6. Butorina, ed. *The Lettering Art : Works by Moscow Designers*. Kniga. Moscow. 1977.
7. For more information of modern use of the Ethiopic script and proposals to expand the current Unicode Standard coverage, see: Yacoub. 'A Roadmap to the Extension of the Ethiopic Writing System Standard Under Unicode and iso-10646' in *Proceedings of the 15th International Unicode Conference*. 1999.

A version of the Sylfaen font was released by Microsoft with Windows 2000 and XP, in order to provide system support for the Armenian and Georgian scripts. It should be noted that this version of Sylfaen contains only a subset of the work described in this article.

In 2003–04, John Hudson completely re-drew the Sylfaen Ethiopic glyphs, regularising them and making them suited to a wider range of publishing needs. This re-design will be released by Microsoft in the next version of Windows, under the name Nyala. Nyala includes support for extended Ethiopic characters newly approved for inclusion in Unicode, and a new matching Latin typeface. Nyala was selected as a winner in the 2004 Type Directors Club type design competition.

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