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created the national phonetic letters and attempted to simplify and reduce the 40,000-odd ideographs to a manageable 1000, but even today it continues to some degree the use of the Pin-Yan Ju Man national romanization system to familiarize its people with the roman alphabet.

There is the growing danger that the proliferation of our media-oriented culture contributes to dehumanization and alienation.* We could well speculate whether unlettered cultures, where inter-personal relationships cohere without the mortar mixed with the 26 grains of sand our letters represent, are not as valid as ours. But for better or worse we must consider our alphabet and our neural and affective response to it is a part of our ecosystem. And, like water and air, we had better take care of it.

* Claude Levi-Strauss sees it as a loss of "authenticity": "We communicate with the immense majority of our contemporaries by all kinds of intermediaries—written documents or administrative machinery—which undoubtedly vastly extend our contacts but at the same time make those contacts somewhat "unauthentic" (1967). Norbert Wiener suggests that more information is possibly less information: "It is no wonder that the larger communities . . . contain far less available information than the smaller communities, to say nothing of the human elements of which all communities are built up" (1948).

REFERENCES

- Bass, R. The Development of CBS News 36, *The Journal of Typographic Research*, 1967, 4, 357-372.
- Bell, G. L. *Studies of Display Symbol Legibility*. Part XVI: The Legibility of Teletypewriter Symbols on Television. Air Force Systems Command (USAF), L. G. Hanscom Field, Bedford, Mass., No. EST-TR-67-104 (MTR-388), April 1967.
- Levi-Strauss, Claude. *Structural Anthropology*. New York: Doubleday, 1967.
- "NBC Recommended Practice for Film and Slide Physical Dimensions for Television Commercials." New York: 1970.
- Neil, A. S. Legibility Requirements for Educational Television, *Information Display Journal*, July/Aug. 1967, 5K, 39-44.
- SMPTE Recommended Practice (RP 8-1968). "Safe Action and Safe Title Areas for TV Transmission." New York: Society of Motion Picture and Television Engineers, 1968.
- Wiener, Norbert, *Cybernetics, or Control and Communication in the Animal and Machine*. Cambridge: MIT Press, 1961.

Creating a Mundurukú Orthography

Marjorie Crofts

Mundurukú, a Tupi language of an Amazon Basin Indian people, has had no written form. This article describes the practical problems of establishing an alphabet to match the spoken language as well as relate to Portuguese, the language of Brazil; e.g., whether or not to represent all phonemes, and basic questions on what constitutes a word, or a sentence. Printed materials in Mundurukú are illustrated.

When we realized that we would be able to "create" a Mundurukú¹ alphabet for a people who had never seen their language in print, we were excited. We were the first people to put this language into writing and make a practical alphabet with the aim of teaching the Mundurukú to read their own language. The speakers were illiterate in Mundurukú when we arrived. Five or six had learned to speak some Portuguese from the Franciscan priests, and three or four of these could read Portuguese. None had ever read Mundurukú. It was in our hands to open to them the whole world of reading.

1. Mundurukú is a Tupi language, as classified by Arion D. Rodrigues, (I. J. A. L. 24.3 [1958]). It is spoken by about 1,200 inhabitants of the upper Tapajos River and its tributaries of Das Tropas, Cabitutú, Cadirirí, Cururú, and São Manoel in the state of Pará, Brazil. Very few of these Mundurukú speak Portuguese. Some 350 Mundurukú live north of this principal location of the tribe, on the Canumã River in the state of Amazonas. The latter group speak Portuguese in their homes and only six or eight adults still speak the Indian language. Field work was carried on under the auspices of the Summer Institute of Linguistics and the Museu Nacional of Rio de Janeiro in this latter location during 1961-63 and in the Cabitutú River area since then. We have also enjoyed lovely hospitality for several months at various times at the Franciscan Mission on the Cururú River. My colleague, Margaret Sheffler, has co-authored with me all the literacy materials. There are about thirty fluent readers in the tribe now. Four or five of these had learned something about reading while in school for a year or two in Portuguese. The others learned as adults with no literacy background. Only three of these are women.

We wrote a set of five primers to teach the letters of the alphabet, with charts for practicing syllables and little stories made up of letters already taught in the series. Following these primers are a set of four "readers"—books with stories from Mundurukú mythology and descriptions of everyday tribal life. These are intended to give the new readers speed and skill in reading—to take them from sounding out syllables or reading hesitatingly, to flowing, expressive reading.

We want them to learn to read so well in their tribal language that they will have minimum difficulty in learning to read in Portuguese, the language of Brazil, when they become bilingual. With a highway planned which will lie close to the tribal area, we know that this is not too far away.

Now we could create "the alphabet to end all alphabets"—the one in which each symbol would represent one and only one phoneme² and people would become literate in no time at all. The alphabet would be so "perfect" that they would just glide from one primer to the next and come out fluent readers. Then we started grappling with the problems of making such an alphabet!

In this paper I briefly outline these problems and our present solutions. These will be discussed under the following headings: 1. symbols for segmental phonemes, 2. word break, 3. morphophonemic writing, 4. supra-segmental symbols, 5. sentence punctuation, and 6. Portuguese orthographical problems and loan words.

2. For the purposes of this paper, which focusses on the practical problems of establishing an alphabet rather than linguistic theory, we shall talk of "phonemes," or those sounds distinguished as "different" by native speakers of the language.

1. Symbols for Segmental Phonemes

The following is a list of Munduruku phonemes and their symbols.³

Vowel	Symbol	Consonant	Symbol
i	í	p	p
ĩ	ĩ	t	t
ε	e	č	c
ẽ	ẽ	k	k
i	u	ʔ	ʔ
ĩ	ũ	b	b
o	o	ʃ	j
õ	õ	s	s
a	a	š	x
ã	ã	h	h
		m	m
		n	n
		ŋ	ğ
		w	w
		y	y
		ř	r

2. Word Break

One of the continual problems in setting up an orthography is deciding "what is a word?" We are writing many bound items as free words. Post-positions (like English prepositions) are written as free words, though they are bound phonologically. All of the morphemes⁴ which we call "aspects" and which mark what we usually call "tense," are bound, but are written as free words. We were influenced to do this by Portuguese, which writes words of these word classes as free words. We also reduce the frequency of long words, though it cannot be proved whether or not this makes reading easier.

3. For a full description of the sound system see "Mundurukú Phonology" by Ilse Braun and Marjorie Crofts in *Anthropological Linguistics*, Vol. 7, No. 7, Oct. 1965. This describes in detail the phonetics of the language from single sounds in a syllable up to sentence intonation.

4. We shall define a morpheme as "the smallest meaningful unit of sound" for the purpose of this paper. For instance, in the English word "boys" there are two morphemes; boy "child of the male sex" and -s "plural."

3. Morphophonemic Writing

We have sets of words with two phonologically-conditioned allomorphs (forms with the same meaning, but different phonetically), i.e., post-positions that begin with d- following vowels and with t- following consonants. We could choose a base form to use throughout, but since d and t are full phonemes, we write these phonemically, not morphophonemically. We have not found that this causes any confusion.

4. Supra-segmental Symbols

The nasalization mark over vowels is used in Portuguese most often in some vowel clusters, where the first vowel of the cluster is marked as nasal, but both vowels are nasalized, i.e., *cão* "dog," *põe* "puts." In a few words single vowels are nasalized, i.e., *lã* "wool." Other nasalization occurs phonetically, but is marked orthographically by a word-final m, i.e., *cem* [sẽ] "100," *bom* [bõ] "good," *sim* [sĩ] "yes." This may cause some confusion for Mundurukú readers learning to read Portuguese, since the nasalization mark in Mundurukú represents heavy nasalization over the vowel on which it occurs. However, the symbol represents nearly the same phonetic phenomenon.

There are four emic⁵ pitches in Mundurukú—three of tone, and laryngealization, which is usually the lowest in pitch. Much has been written recently about whether tone need to be represented in an alphabet.⁶ The arguments seem to center about whether tone

5. The terms "emic" and "etic" are basic to the tagmemic theory of linguistics, on which the analysis of Mundurukú was made. These are defined by the one who coined them as follows: "The etic viewpoint studies behaviour as from outside of a particular system, and as an essential initial approach to an alien system. The emic viewpoint results from studying behaviour as from inside the system. (I coined the word etic and emic from the word phonetic and phonemic, following the conventional linguistic usage of these latter terms. The short terms are used in an analogous manner, but for more general purposes.)" *Language in Relation to a Unified Theory of the Structure of Human Behaviour* by Kenneth L. Pike, 2nd ed. (The Hague: Mouton + Co., 1967), p. 37.

6. For further reading about problems in representation of suprasegmental phonemes, see: "A Tone Orthography for Trique" by Robert E. Longacre, *The Bible Translator*, Vol. 4, No. 1, Jan. 1954. And for discussion about not representing all the phonemes or tonemes, see "Bases for Formulating an Efficient Orthography" by Paul S. Powlison, *The Bible Translator*, Vol. 19, No. 2, April 1968; "More on

carries a heavy functional load or not. This was what made us decide not to write Mundurukú tone, which seems to be like "icing on the cake." It carries next to no functional load. There are thirty tone pairs or so, but many of these are words of different word classes—a noun and a descriptive verb, for instance; i.e., *i³pi³* "earth" and *i³pi²* "it hurts." Most of these pairs are clearly distinguished by context.

There are a few places where tone perturbation needs to be marked in the orthography, however, or the reader has to back up an entire clause.⁷ The last syllable of all question words carry tone 2 (next to the highest). When the question word is head of a genitive phrase, however, this tone is perturbed to tone 3 (lower); which, in turn, perturbs the preceding syllable. We have chosen to mark this perturbation with a hyphen. This enables the reader not to stumble as he reads. Hyphen, then, marks tone perturbation in genitive question phrases; i.e., *a³bu²* "who," but *a²bu³duk³?a²* "whose house" (written: *abu-duk'a*). *a³jo²* "what," but *a²jo³xe²?e²* "the skin of what" (written: *ajo-xe'e*).

Post-positions are not free words, but we write them as free words (see Section 2). When these occur with question words, tone perturbation occurs, and we mark this also with hyphen, i.e., *a²bu³kay²* "toward whom"; *a³bu²* "who" *kay³* "toward" (written: *abu-kay*).

5. Sentence Punctuation

We use sentence punctuation as close to Portuguese punctuation symbols as possible. One problem in this area is whether to write according to phonological or grammatical analysis. What is a sentence? Is the sentence "He came, he saw, he conquered" one

Formulating Efficient Orthographies" by Sarah C. Gudschinsky, *The Bible Translator*, Vol. 21, No. 1, Jan. 1970; "Toneme Representation in Mazatec Orthography" by Sarah C. Gudschinsky, *Word*, Vol. 15, No. 3, Dec. 1959; and "Native Reactions to Tones and Words in Mazatec" by the same author, *Word*, Vol. 14, No. 2/3, Aug-Dec, 1958.

7. Gudschinsky, op. cit., cites an example of similar ambiguity when tone is not represented in the orthography, and an intelligent, educated native speaker of a tone language of West Africa needing to read a sentence through to himself before he is able to read it aloud (p. 23).

sentence, or three? Does the comma in this English sentence stand for rising intonation? If it does, and we use intonation as a criterion for sentence break, there will be some Mundurukú sentences with six or eight verbs, separated by commas.

We teach capital letters and all the punctuation marks necessary from the first page of our first primer. Very early in the primer series we use charts with a lower-case and upper-case letter together, to show that they are "nearly the same."

Following the five primers that teach the alphabet, we have a set of four readers.⁸ In these readers we include all of the punctuation marks that we know occur in the New Testament, which we expect to publish eventually. This includes quotes, quotes within quotes, and quotes within quotes within quotes. The question of quotation marks is of special interest because there is a morpheme (i) in Mundurukú which marks quoted material, i.e., ejēm i João o'e "come here," John said." Quotes are used very frequently in daily conversation and in story-telling, as are quotes within quotes, which are marked by two juxtaposed, but clearly pronounced i's, i.e., ebapũg em napa ma ěn em 'wetaybit ġu ixem' i, i o'e "three times you will lyingly say 'I don't know him,' he said." Technically, we would not have to use a punctuation mark at all to mark quoted material, since there is an overt morpheme to mark this. But, we are using the Portuguese symbols to facilitate transition to Portuguese (with the i morpheme, of course). Quotes within quotes within quotes are not marked by three juxtaposed i's, but by word order. Thus we are using: to mark first quote, with i at the end; "" to mark quote within quote; and indentation to mark the third level quote.

6. Problems in Relation to Portuguese Orthography and Loan Words

There are some problems posed to those who will learn to read Portuguese after learning to read Mundurukú with this orthography.⁹ The range of back vocoids from [u] to [o] comprise one

8. Probably the most thorough and most practical guide to primer construction in unwritten languages (or any others), and the basic guide for our work in this is Sarah C. Gudschinsky, *Handbook of Literacy*, Summer Institute of Linguistics, Univ. of Oklahoma, 1962; and "Recent Trends in Primer Construction," *Fundamental and Adult Education*, Vol. XI (1959), No. 2, by the same author.

9. A good number of articles in *The Bible Translator* are dedicated to consideration of the prestige language in establishing orthographies for newly-written languages.

phoneme. It was almost a toss-up whether we used o or u to symbolize this phoneme. We chose o. The first problem resulting from this choice was that the name of the tribe, pronounced by them [mũn-juřuku] came out spelled mōnĵoroko. This appears on the covers of all the primers and readers. It is bad publicity for those interested in linguistic work and seeing these primers as representing what is supposed to be a scientific alphabet. Were we to do it again, we would use u for the back vowel phoneme and o for the mid-high i.

The symbol t represents the same sound in Portuguese as in Mundurukú. In Portuguese, however, where it precedes front vowels, it is pronounced [č] in the tribal area of Brazil, which is a separate phoneme in Mundurukú. It would help in the transition to Portuguese were we to represent the one Mundurukú phoneme with two letters to parallel Portuguese usage. The symbol k is used in a few loan words in Portuguese, such as kerosene and Kodak, but is "foreign" and it might have been better not to use it. Had we used c for [k], we could have used ch for [č], but it is always more difficult to teach two symbols for one phoneme.

The symbol ĵ represents [j] in Mundurukú, but [ž] in Portuguese, which will be one more thing for bilinguals to re-learn.

Neither w or y occur in Portuguese except in borrowed words. These tend to make the alphabet look "foreign." However, words occur like [iuiuii] "is washing it" and [ĩũĩũĩ] "is arrowing it" and [iioiioi] "is frying it," which are more correctly spelled iwuywuy, iwũywũy, and iyoyoy, respectively, than with seven vowels. Phonetic differences clearly distinguish w and u, and i and y.

The symbol that is most "far out" is ġ, which represents a phoneme with three allophones (variants): ŋ syllable-finally following nasal vowels, gŋ syllable-finally following oral vowels, and ñ syllable-initially. Mundurukú have absolutely no trouble with this symbol, but it will be a hurdle to learn two symbols in Portuguese in its place: m (as in the word Belem) and nh [ñ]. There is no equivalent to the second variant. On the other hand, the emicness of this symbol and the fact that the symbols for the Portuguese equivalents are so different may make it the easiest to re-learn in Portuguese.

These appear in the following volumes of that publication: 3:59, 5:35 ff., 5:45 f., 5:175, 6:125, 7:19 ff., 8:39, 9:183, 10:53 f., 10:62 f.

Some loan words have letters which do not occur in the Mundurukú alphabet. Since this tribe already has contact with Brazilians and will have much more soon, many more will be learning to speak and to read Portuguese. In dealing with the loan words already in use in the tribe, we have three choices. We can transliterate all of them, substituting for the sounds that do not occur in Mundurukú the sound (and symbol) closest to it phonetically, or the one used by them in pronouncing that word (if that is different). Or, we can spell the loan word with Portuguese spelling and let them struggle to learn a few new symbols. Or, thirdly, we could transliterate the Portuguese words used in Scripture which are completely new to them (such as place names), but use Portuguese orthography for the words with which they are familiar (some names for persons). We have chosen to spell with straight Portuguese orthography. We feel that this will show them that we believe that they can learn these "odd" words. To transliterate would be an insult to their intelligence. As the tribe learns more and more Portuguese, the books printed in Mundurukú will not be tossed aside because they are written "down" to those not knowing any Portuguese.

Whereas it is a real challenge and thrill to "create" an alphabet for a tribe becoming literate, there are problems involved. These range from deciding whether or not to represent all the phonemes, whether to represent them one-for-one or otherwise, to omitting symbols that look "foreign" and questions like: what is a word? what is a sentence? and, how shall I spell these words so that this book will still sell fifteen years from now?

It is a great thrill to see a people reading their own language for the first time in history. We were teaching one 45 year-old chief to read in a men's reading class one day. The Mundurukú seldom show much emotion, but he really got excited. He had discovered what a syllable was! He threw up his hands and exclaimed, "Oh, what a wonderful book this is!" That makes it worthwhile struggling with the problems!

Wuyjuyū yaberenat'a o'yamuy uk'a. O'yamuy ip Topağa a'ō kay'ūm puye. Yaberenat'a muy ojuy ip tūy be oca'ōbuyxi jījā iān o'e ip puye. Topağa bodi ma iān o'e ip.

—Oca'ōbuyxi jījā, i napa ma o'e ip soat pe wuyjuyū be.

Koap pima pūğ'a'ōm ma kawēnwēn osodop ip ipi dağayū. Topağa ibu'u jījā osunuy ixeyū be yamuy am. Imēnpuye ixeyū a'ō o'ya'ōmuwarurun. Pūğpūğ ixeyū in pūğ'a'ōm o'jekawēn. Warara'atayū bit wara'at'a'ōm jekawēn Topağa ixeyū a'ō o'ya'ōmuwarurun puye. Imēnpuye itaybit ġu o'e ip jebureyū ekawēn. Oibu'un ip yamuy am jebureyū ekawēn itaybit'ūm puye. Yamuy am o'jepere ġu ip. Iğo'a butet Babel i osunuy.

1. Ajo'a muy ojuy ixeyū wuyjuyū?
2. Apēnpuye yamuy ojuy ip?
3. Apēnpuye Topağa ixeyū a'ō o'ya'ōmuwarurun?

Gēnesis 11:1-9.

Above and on the following page are examples of the new Mundurukú written language as created by Marjorie Crofts. Similar printed sheets will be tipped-on pages of a Portuguese language Bible story book so that the readers can lift the Indian language sheets and compare sentences, word-for-word, with the Portuguese. Composition of the Mundurukú material is by Cascade Publishing Company, Portland, Oregon, on a specially-adapted IBM Selectric Composer. Characters that are not needed for Mundurukú are filed off a standard Selectric "golf ball" and replaced with new Mundurukú characters and accents—which have been cast in plastic, glued on, and given a thin metal plastic coating. A memory unit programmed into the machine stops the carriage when the operator strikes an accent, permitting the next letter to be impressed directly under the accent.

Other authors treating problems in making orthographies are: Kenneth L. Pike, *Phonemics*, Chapt. 16, Ann Arbor: University of Mich. Press, 1947; "Orthography Studies: Articles on New Writing Systems" by William A. Smalley and others (in *Helps For Translators*, Vol. VI [United Bible Societies]) (Amsterdam: North-Holland Publishing Company, 1964), p. 173. *The Bible Translator* has had several articles on orthography construction in general: "How Shall I Write This Language?" by William A. Smalley, Vol. 10, No. 2, April 1959; "Practical Limitations to a Phonemic Alphabet" by E. A. Nida, Part I, 5:35 ff., Part II, 5:58 ff. "Orthographic Problems in Yipounou", 1:110 ff., "Dialect and Orthography in Kipende" by William A. Smalley, 9:63 ff., "Problems in Orthography Preparation" by William A. Smalley, 5:170 ff.

Topağa kaxi o'ğubapuk. Kuyje soat eipi dağ kabiok osodop. Iba'ore wuyjuyū eku am kabiok tağ. Ka'ūma ma wuyju ijojom kabiok pima. Imēnpit soat eipi dağ kabiok osodop kuyje. Ka'ūmğu tumūn'ip'ip osodop. Ka'ūmğu tumūntitit osodop. Ka'ūmğu wasū osodop. Ka'ūmğu puca osodop. Ka'ūmğu tumūn'a'a osodop. Ka'ūmğu wuyjuyū osodop. Soat tağ kabiok osodop. Topağa bit ibu'u o'e soat tağ kabiok am.

—Kaxi oğuçe ipi mukabia am, io'e Topağa.

Imēnpuye Topağa kaxi o'ğubapuk ipi mukabia am. Kabiok ğu osodop ğebuże bit.

1. Apēn osodop ipi dağ kuyje?
2. Topağa du ibikuy o'e soat tağ kabiok am?
3. Abu kaxi o'ğubapuk?

Gēnesis 1:2-5.

Cebay o'jekawēn Jacó eju.

—Obadipyū kay juy eju. Ibocewi ayacat etojot etayxim, io'e.

Jacó o'ju wūyatka kay—jebay badipyū ka kay. Cucum pima o'xet e bidase. Wita'a jeje ya'a o'xet. O'jexeyxey. Wadakġūn o'jojojo jexeybi. Kabi kadi yabi osunuy. Ipi ju yopkobi osunuy. Topağa a'ō dujowatwat'ukayū kopkom ip o'e wadakġūn tağwi, jeuhum tak. Topağa cūġ'i o'jojojo wadakġūn abi be kabi kadi jexeybi.

Ĝebuże Topağa o'jekawēn Jacó eju.

—Soat idip je'e ewebeam ēn wa'ō kay jījā buye. Exe okukpin. Imēnpuye eweju ojukuku ġasū bit. Ağ ōn ekay, io'e Jacó be.

Cewurūġ puje Jacó icokcok cīcā o'e Topağa o'jekawēn buye jexeybi.

1. Apēn Jacó o'e e bidase?
2. Ajo o'jojojo jexeybi?
3. Pomawiat wadakġūn?
4. Topağa o'jekawēn tu ceweju jexeybi?

Gēnesis 28:10-16.

Type Design Classification

Walter Tracy

To follow the article by Gerrit Noordzij (*The Journal of Typographic Research*, IV [Summer 1970], 213-240) which analyzed the German classification, an account is given of the French and German classifications. It is shown that all three schemes have the same structure though the nomenclature is different. Hope is expressed that the British classification will be acceptable in the United States.

Gerrit Noordzij's article in the Summer 1970 number of this journal was chiefly concerned with the fraktur letterform. To show that even in Germany there is misunderstanding of fraktur, he criticized the "Klassifikation der Schriften," DIN 16 518 (1964), the original text of which was reproduced in his article. Readers not directly engaged in printing may wish to know that DIN 16 518 is not the only one of its kind. A similar classification was published by the British Standards Institution in 1967, and this article will show that the German and British classifications are very close to the one devised by Maximilien Vox in France in 1954.

It is not the purpose here to defend the classifications against the assertion in the introduction to Mr. Noordzij's article that "current systems of typeface classification are fundamentally useless as they isolate type from other renderings of handwriting." The fact that the pre-history of type design is to be found in handwriting is interesting but of little value in the practical affairs of typography and printing today.

The need for a classification is as obvious in printing as it is in botany or any other subject which has to be taught by some people and learnt by others, and where the "materials" of the subject are diverse in style and numerous in quantity. From the beginning of the nineteenth century the range of type designs developed to such an extent that type-founders and the writers of trade manuals found it