L2/25-039

Revised Proposal for Encoding the Mwangwego Script in the UCS

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To: Script Encoding Working Group (SEWG) / Unicode Technical Committee (UTC)

From: Oreen Yousuf; Daniel Yacob

Subject: Mwangwego

Date: 2024 November 8

General Overview:

This is a revised proposal to encode the Mwangwego script into the Unicode Standard. It supersedes the following documents:

- L2/12-251: “Preliminary proposal to encode the Mwangwego script in the UCS”
- L2/12-311: “Proposal to encode the Mwangwego script in the UCS”
- L2/24-241: “Proposal for Encoding the Mwangwego Script in the UCS”

This version differs from the most recent version, L2/24-241, due to the following reasons and updates:

- 42 additional images in Section IX showing evidence of use of the script.
- “Mutuyo glyph uniqueness” under the “Additional information on characters” subsection.
- Updated character properties for Mutuyo and Mituyo based on SEWG feedback.

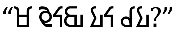
I Background

The Mwangwego script was first devised in 1979 by Nolence Moses Mwangwego of Malawi, and is designed for writing the languages of Malawi. Some of these languages include the following, along with their *ISO 639 code* and speaker count: Chewa (*nya*, 2 million), Lomwe (*ngl*, 2.5 million), Sena (*swk* in Malawi, *seh* in Mozambican, *bwg* for the divergent Barwe dialect; 2.9 million), Tonga (*tog*, 170,000), Tumbuka (*tum*, 2.3 million), Yao (*yao*, 3.1 million), Nyakyusa (*nyy*, 1.4 million). The majority of these languages are also spoken in parts of nearby countries such as Mozambique, Tanzania and Zambia.

Additional letters were created up until April 7, 1997 and launched to the public. The script has not changed significantly over time and is not related to any other script. In 2003 the script received notable publicity, including an audience with Minister Kamangadzai Kingsley Chambalo, the Malawian Minister of Youth, Sports and Culture at the time.

The users of the community are students of the script, some of which are school-aged children. There was an initial community of 200-300 adherents of Mwangwego script in 2001. The number of people who have learned the script since 2001 is between 2,500-3,000. Many are training to be teachers themselves. The script has been continuously learned and taught since 2001 in all 3 regions of Malawi: Northern, Central and Southern Regions. The script has been taught informally since 2001. The distribution of January 2023 cohort of students is broken down as follows: 10 in Karonga, 15 in Mzuzu, 10 in the Malawian capital of Lilongwe, and 5 in Blantyre. The script is also included in primers and learning exercise materials for students. As of mid-2024, another cohort of teachers are being trained.

There has only been 1 full book officially published in the script, by the creator, as cost is a major obstacle for the majority of past and current learners. However, the script has taken on a life beyond the script creator and his social circle. The author proposals have even introduced previously unknown script users to the creator. Every image of handwritten text in Section IX showing evidence of use comes from users other than the script creator. There is no government support for the script. There are at least 4 fonts: one made by Tapiwanashe Sebastian Garikayi, one by Andrij Rovenchak, one by Enzo Bicudo Pepi (MetrikEnzyme), and one by Jana Reddemann and Jenna Leich, the latter of which is used in this proposal. Under consultation with the script creator, the authors have developed a keyboard that applies the character model described in this proposal. The keyboard has been developed with the well-known "Keyman" software and a Microsoft Windows executable is available here: https://bit.ly/4e11h3D .

While the Malawian government endorses the Latin script for the languages mentioned above, there are no other scripts in competition among the Mwangwego script community, and the character repertoire has been stable for decades. There is also a current project to digitize Nolence Mwangwego's Chichewa language book "" (Latin transliteration: "*A Malawi Tili Pati?*"; English translation: "*Malawians, where are we?*"), which was written in the Mwangwego script.

II Script Name

The proposed script name is "**MWANGWEGO**", which is named after the creator, Nolence Mwangwego. This is the name used by the script community.

On 3 April 2024, Nolence Mwangwego stated on Facebook that the script "*in Malawian languages is called '**musitu wa Mwangwego'**. The word 'musitu' comes from three parts of the script: musisi, siri, mutuyo. Mwangwego script was invented in April 1979 and was inaugurated on April 7, 1997. These are dates to remember*" (see Reference 6 in Section VII).

III Structure

The Mwangwego script is an abugida written left-to-right in horizontal lines, from the top to the bottom of a page. The basic grapheme inventory accounts for 31 consonants and 5 vowels – /a/, /ɛ/, /i/, / ɔ/, and /u/. Each basic grapheme represents a syllable composed of a consonant and a vowel (CV), or a vowel (V) by itself. Students first learn the graphemes that have an inherent /a/ vowel (e.g., /a/, /ba/, /ʧa/, etc.). These inherent /a/ vowel graphemes, as shown in the chart below under the column labeled "/a/". Any single one of these graphemes is called a **Musisi**. All Musisi (i.e., the plural) is collectively called ***Misisi***. Misisi can be slightly altered in 1 of 4 graphically consistent ways to change the grapheme's vowel from an inherent /a/ to /ɛ/, /i/, / ɔ/, or /u/. Any single one of these 4 vowel modifiers is called a **Siri**. All Siri (i.e., the plural) is collectively called ***Masiri***. Attaching Masiri to Misisi will yield a total of 160 basic V or CV syllabic graphemes. Any single one of these new graphemes with a vocalic value of /ɛ/, /i/, / ɔ/, or /u/ is called a **Musiri**. All Musiri (i.e., the plural) is collectively called ***Misiri***.

IPA	/a/	/ɛ/	/i/	/ɔ/	/u/
/vowel/					
/b/					
/ʧ/					
/d/					
/f/					
/g/					
/ɣ/					
/h/					
/ʤ/					

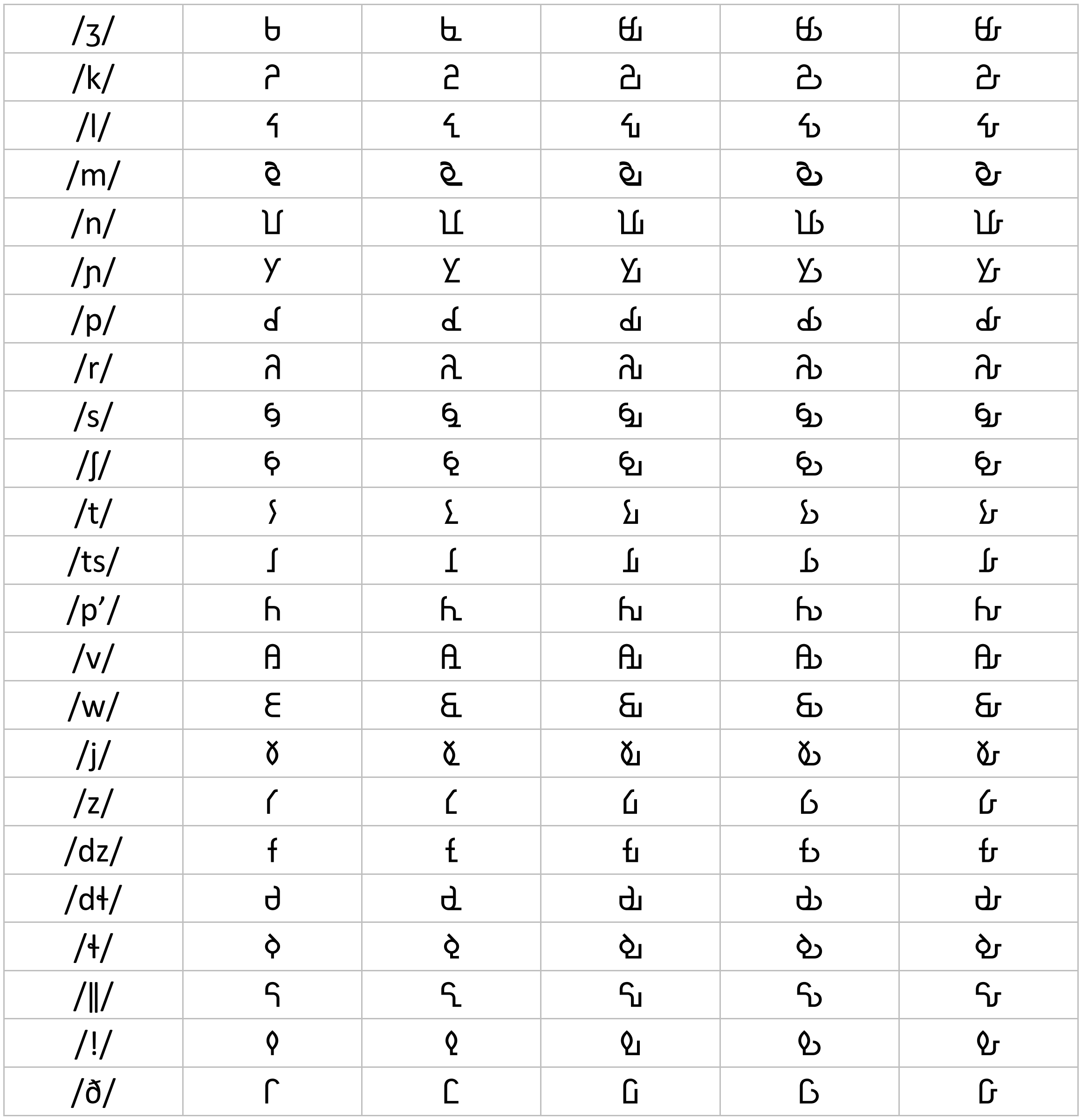


Table 1. Inventory of the basic V and CV syllabic graphemes in the Mwangwego script.

To change the inherent /a/ vowel of Misisi to /ɛ/, /i/, /ɔ/, or /u/, you fuse Masiri (vowel modifiers) to the bottom-right of Misisi:

Emwa: ◌̠ Example: Ʊ (ba) + ◌̠ (-ɛ) = Ʊ̠ (be)

Ima: ◌ɹ̠ Example: Ʊ (ba) + ◌ɹ (-i) = Ʊɹ (bi)

Ota: ◌ɔ Example: Ʊ̠(ba) + ◌ɔ (-ɔ) = Ʊɔ (bɔ)

Uyu: ◌ɾ Example: Ʊ̠(ba) + ◌ɾ (-u) = Ʊɾ (bu)

Mutuyo & Mituyo:

In addition to these vowel modifiers, some consonant (or tone) modifiers appear to the left (spacing) of the basic grapheme, or above or below (non-spacing) the basic grapheme. These can also be used in combination with one another to further extend the repertoire of consonant onsets or, in one case, to mark high-tone to distinguish between homographs. Not all of these modifiers can be used with all basic graphemes. Section X show which marks are possible for the Misisi. All valid possibilities are possible for the Misiri counterparts.

Any one of these marks is called **Mutuyo**. You can attach multiple Mutuyo onto a single basic grapheme. The plural of Mutuyo is ***Mituyo***. Some Mituyo configurations produce more complex spacing characters.

The script's previous proposal (Section 4, L2/12-311) proposed to encode all spacing Mituyo configurations due to the constraints of ligation at the time. For compound consonant modifiers one could use the 'rlig' or 'ccmp' OpenType features to replace a sequent of modifiers with a precomposed stacked version. 'ccmp' would be the most reliable across platforms. Therefore, we propose to only encode the standalone modifiers (i.e., Mutuyo). The set of combinations (i.e., Mituyo) is finite, as is the order in which combinations are combined. It is never correct (i.e., legible) to string them horizontally, and making them "ligatures" may easily fail in many rendering environments, which is unnecessary and undesirable. Readers do not parse the stacks per se, but read the whole cluster as a whole.

1. **MUTUYO** (spacing):

1.1 WAYA. - labializes consonants. There is a unique, non-spacing counterpart of Waya that appears under a letter instead of to the left; see Mutuyo 2.1 below.

Examples of use:

- (waya) + Ʊ (ba) = -Ʊ (bwa)   - (waya) + Ձ (ma) = -Ձ (mwa)

Example words:

-ƱϦ (bwato) -Ձʕ (mwala)

1.2 NI. " is primarily used for homorganic palatalization (which may not be reflected in the transliterated romanization).

Examples of use:

" (ni) + Ʒ (da) = "Ʒ (nda) – tip of the tongue touches the front part of the palate
" (ni) + ʅ (ta) = "ʅ (nta)
" (ni) + ʃ (tsa) = "ʃ (ntsa)
" (ni) + ƒ (dza) = "ƒ (ndza)
" (ni) + Ⴘ (a) = "Ⴘ (ng'a) – rear of the tongue touches the palate
" (ni) + Ꞓ (ga) = "Ꞓ (nga)
" (ni) + ୨ (cha) = "୨ (ncha) – middle of the tongue touches the palate
" (ni) + ɤ (ja) = "ɤ (nja)
" (ni) + ϭ (sa) = "ϭ (nsa) – tongue slightly touches the palate
" (ni) + ϙ (sha) = "ϙ (nsha)
" (ni) + ℶ (fa) = "ℶ (mfa) – labiodentalization
" (ni) + Ꭿ (va) = "Ꭿ (mva)

Example words:

"ƷϨ (ndati) ,   "ႸƱ (ng'ona) ,   "ϭძϦ (nsapato) ,   "୨Ϧ (nchalo)

1.3 HI. ¨ aspirates consonants. Its use may be limited to only a few consonants.

Examples of use:
¨ (hi) + 9 (cha) = ¨9 (tcha) , ¨ (hi) + ʔ (ka) = ¨ʔ (kha) , ¨ (hi) + ɗ (pa) = ¨ɗ (pha)
¨ (hi) + ʆ (ta) = ¨ʆ (tha) ¨ (hi) + ʃ (tsa) = ¨ʃ (tsha)

Example words:
¨ʔϞɹ (khasu) ¨ʔə (khama) ¨ɗϟ (phala) ¨Ⴆ-Ʊ (thobwa) ¨9ɹᘏ (tchimo)

1.4 MI. ‶ pre-nasalizes labial consonants. It is described as "used when both lips meet heavily." It is used with 2 Misisi (and of course their corresponding Misiri): Ʊ (/ba/) and ɗ (/pa/).

Examples of use:
‶ (mi) + Ʊ (ba) = ‶Ʊ (mba) ‶ (mi) + ɗ (pa) = ‶ɗ (mpa)

Example words:
‶Ʊϟ (mbala) ‶Ɯɹ (mbiri) ‶Ʊʆʆ (mbatata) ‶ɗʔ (mpaka)

1.5 MYU. ʻ pre-nasalizes non-labial consonants. It is described as "used when pronouncing a word which involves a slight meeting of both lips." Myu occurs with many Misisi.

Examples of use:
ʻ (myu) + 9 (cha) = ʻ9 (mcha) ʻ (myu) + ʔ (ka) = ʻʔ (mka) ʻ (myu) + ə (ma) = ʻə (m'ma)
ʻ (myu) + ʆ (ta) = ʻʆ (mta) ʻ (myu) + f (dza) = ʻf (mdza)

Example words:
ʻʔʔ (mkaka) ʻʔ‶Ɛ (mkanda) ʻɟᘏ (m'dziko) ʻəɹɟ (m'mudzi)

1.6 SISA. ʼ prefixes 's-' to consonants. Very few words use Sisa as it is mainly used for foreign loan words (e.g., English; see 7:16 of reference 3 in Section VII below).

Examples of use:
ʼ(sisa) + ʔ (ka) = ʼʔ (ska) ʼ(sisa) + ə (ma) = ʼə (sma) ʼ(sisa) + ʆ (ta) = ʼʆ (sta)

Example words:
ʼƱə (stima) ʼ2Ƽ (sketi)

1.7 TUMBU. ˈ causes prenasalization. It is only used for Yao and Nyakyusa/Ngonde.

Examples of use:
ˈ (tumbu) + Ɛ (da) = ˈƐ (n'da)
ˈ (tumbu) + Y (nya) = ˈY (n'nya)
ˈ (tumbu) + ʊ (ya) = ˈʊ (n'ya) – in Yao
ˈ (tumbu) + Ɛ (wa) = ˈʊ (n'wa)

Example words:
ˈƜƼ , ꟺˈəƔ , ˈႦ-əɹ2

2. **MUTUYO** (non-spacing):

2.1 WAYA-BELOW. ◌̱ adds a following y-glide (palatalization) to consonants. This is the non-spacing counterpart of WAYA in 1.1 above.

Examples of use:
Ʒ (da) + ◌̱ (waya) = Ʒ̱ (dya)
Ҽ (ma) + ◌̱ (waya) = Ҽ̱ (mya)

Example words:
ȴɖ̱ɖ̱ , Ʒ̱ɿ , ୨ઠƷ̱

2.2 MURA. ◌̏ adds a following r-glide to consonants. This Mutuyo is also used for foreign words (e.g., English).

Examples of use:
Ʊ (ba) + ◌̏ (mura) = Ʊ̏ (bra)
Ɂ (ka) + ◌̏ (mura) = Ɂ̏ (kra)
ʃ (ta) + ◌̏ (mura) = ʃ̏ (tra)

Example words:
Ɯɩ̏ɯ , Ʊ̏ɾɩɓ

2.3 MULA. ◌̀ adds a following l-glide to consonants. This Mutuyo is also used for foreign words (e.g., English).

Examples of use:
Ʊ (ba) + ◌̀ (mula) = Ʊ̀ (bla)
Ɂ (ka) + ◌̀ (mula) = Ɂ̀ (kla)
ʃ (ta) + ◌̀ (mula) = ʃ̀ (tla)

Example word:
Ʊ̀"ʃꝺ (translation: Blantyre)

2.4 PEWA. ◌̂ serves a variety of purposes, indicating affrication and other consonant modifications. It is particularly used a lot in Tumbuka, Kyangonde (a dialect of Nyakyusa; possibly other Nyakyusa dialects as well), and Yao.

Examples of use:
Ʊ (ba) + ◌̂ (pewa) = Ʊ̂ (Chichewa Latin transliteration is ŵa;
Tumbuka Latin transliteration is ba; IPA: /βa/)
Ɑ (va) + ◌̂ (pewa) = Ɑ̂ (bva)
ɾ (za) + ◌̂ (pewa) = ɾ̂ (bza)
Ɔ (fa) + ◌̂ (pewa) = Ɔ̂ (pfa)
Γ (tha) + ◌̂ (pewa) = Γ̂ (IPA: /θa/) – in Lomwe

Example words:
Ʊ̂ƱƩ , Ɯ̂ɾ·ɩɾ

2.5 KWANTHU. ◌́ marks high tone, at least on words which might otherwise be misread. It is very important in Chichewa because there are 2 tones (in contrast to a language like Tumbuka having no tones).

Examples of use:
(di) + ◌́ (kwanthu) = (ndi)

Example words:
(mtengo; translation: tree) to distinguish from (mtengo; translation: price)

3. **MITUYO *"stacks"*:**
As Mituyo is the plural of Mutuyo, any combination of 2 individual Mutuyo on a single grapheme can be considered a Mituyo combination. For example, and both combine a spacing Mutuyo (NI " and WAYA -, respectively) with a non-spacing Mutuyo (WAYA-BELOW ◌̱ and PEWA ◌̂, respectively). These are considered Mituyo combinations. However, it is worth specifically highlighting how the *spacing* Mutuyo (described in 1.1-1.7 above) can create spacing Mituyo "stacks" that are written on the left of a grapheme. There are 16 possible Mituyo stacks:

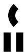
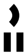
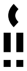
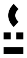
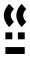
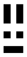
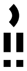
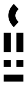
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
															
MYU NI	MYU HI	MYU WAYA	MI HI	MI WAYA	NI HI	NI WAYA	HI WAYA	SISA NI	TUMBU WAYA	MYU NI HI	MYU HI WAYA	MI HI WAYA	NI HI WAYA	SISA NI HI	MYU NI HI WAYA

Table 2. Inventory of the 16 spacing Mituyo "stacks".

Similar to the (individual) Mutuyo, not all Mituyo are used for all languages. For example, the Mituyo stack TUMBU+WAYA (numbered 10 in Table 2) is only used in Nyakyusa/Ngonde.

3.1. MYU-NI.

Examples of use:
MYU-NI + (da) = (mnda)
MYU-NI + (ka) = (mnka)

Example words:

3.2. MYU-HI.

Examples of use:
MYU-HI + (cha) = (mchha)
MYU-HI + (ka) = (mkha)

Example words:

3.3. MYU-WAYA.

Examples of use:
MYU-WAYA + (ba) = (mbwa)
MYU-WAYA + (cha) = (mchwa)

Example words:

3.4. MI-HI. ⁞

Examples of use:
⁞ MI-HI + ɗ (pa) = ⁞ɗ (mpha)

Example words:
⁞ɗΣ , ⁞ɗ‼Ɑ

3.5. MI-WAYA. ⁝

Examples of use:
⁝ MI-WAYA + Ʊ (ba) = ⁝Ʊ (mbwa) ⁝ MI-WAYA + ɗ (pa) = ⁝ɗ (mpwa)

Example words:
⁝Ʊ"Ʒ , ϥ“Ʊ , ɾ“Ʊ̱

3.6. HI-WAYA. ꞊

Examples of use:
꞊ HI-WAYA + ʔ (ka) = ꞊ʔ (khwa) ꞊ HI-WAYA + ʃ (ta) = ꞊ʃ (thwa)

Example words:
꞊ɗϥ , ꞊ɗΣ

3.7. NI-HI. ‼

Examples of use:
‼ NI-HI + ց (cha) = ‼ց (nchha) ‼ NI-HI + ʔ (ka) = ‼ʔ (nkha)

Example words:
‼ʔ"Ʒɔ , ‼ʔϭ , ‼ց⅃ɾ

3.8. NI-WAYA. ‼̲

Examples of use:
‼̲ NI-WAYA + Ɥ (a) = ‼̲Ɥ (nwa) ‼̲ NI-WAYA + Ʒ (da) = ‼̲Ʒ (ndwa)

Example words:
‼̲ⱭƱ , ‼̲Ɑʃ , ‼̲Ɑ“Ʊ

3.9. SISA-NI. ⁛

Examples of use:
⁛ HI-WAYA + Ʒ (da) = ⁛Ʒ (snda) ⁛ HI-WAYA + Ɑ (ga) = ⁛Ɑ (snga)

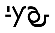
Example words:
⁛ʔϥ

3.10. TUMBU-WAYA.

Examples of use:

TUMBU-WAYA + (gha) = (n’ghwa) TUMBU-WAYA + (ha) = (n’hwa)

Example words:

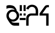


3.11. MYU-NI-HI.

Examples of use:

MYU-NI-HI + (ka) = (mnkha) MYU-NI-HI + (ta) = (mntha)

Example words:



3.12. MYU-HI-WAYA.

Example of use:

MYU-HI-WAYA + (cha) = (mchhwa)

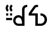
Example words:

3.13. MI-HI-WAYA.

Examples of use:

MI-HI-WAYA + (pa) = (mphwa)

Example words:

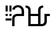
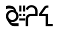


3.14. NI-HI-WAYA.

Examples of use:

NI-HI-WAYA + (cha) = (nchhwa) NI-HI-WAYA + (ka) = (nkhwa)

Example words:

3.15. SISA-NI-HI.

Examples of use:

SISA-NI-HI + (ka) = (snkha) SISA-NI-HI + (ta) = (sntha)

Example words:

3.16. MYU-NI-HI-WAYA.

Examples of use:

MYU-NI-HI-WAYA + (ka) = (mnkhwa) MYU-NI-HI-WAYA + (ta) = (mnthwa)

Example words:

In summary, there are 32 Misisi (inherent /a/ vowel graphemes), 4 Masiri (vowel modifiers), 12 Mutuyo (11 consonant modifiers; 1 tone modifier), and 16 Mituyo (“stacks”) to encode.

- It is worth mentioning that the WAYA Mutuyo and the WAYA-BELOW Mutuyo *must* be encoded as two symbols and not only one. This is because if one were to process plain text (e.g., transliteration) one needs to be able to interpret the bytes as being “wa” (from WAYA) and “ya” (from WAYA-BELOW), which one couldn’t do with a single character point as position information is lost in plain text.

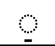
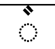
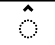
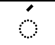
Punctuation and Numerals/Digits:

There are no script-specific digits in the script; Hindu-Arabic digits (i.e., 0123456789) are used. There are no script-specific punctuation marks. Words are separated using U+0020 SPACE .

IV Character Repertoire

Table 3 presents the character names for the 32 Mwanwego Misisi (singular Musisi; inherent -/a/ graphemes/letters), 4 Masiri (singular Siri; vowel marks), 12 Mutuyo (consonant/tone modifiers), and 16 Mituyo (complex Mutuyo combinations). The Chichewa language terms for the orthographic elements have been employed to clearly and distinctly identify the characters by their encoded names.

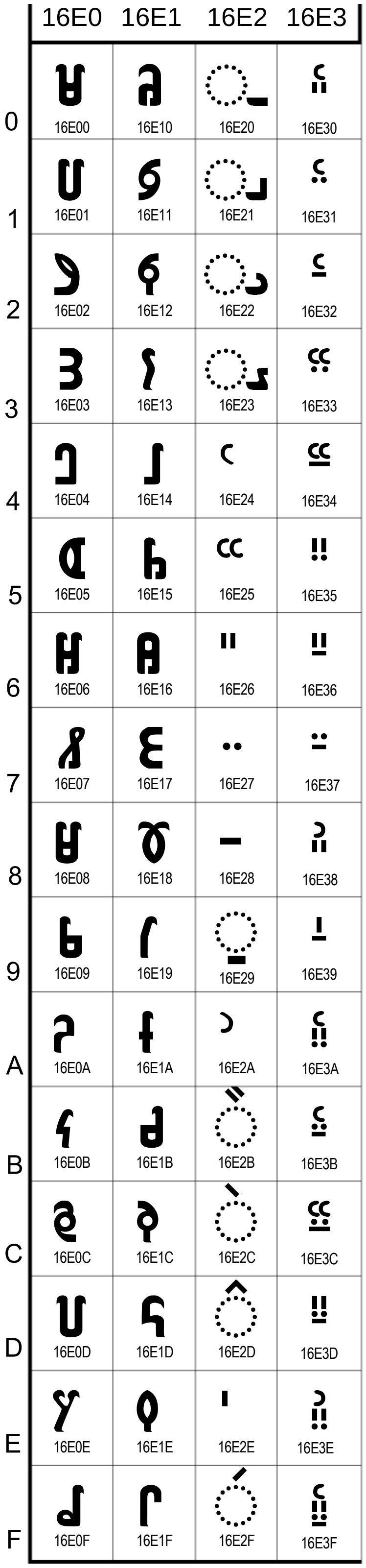
	U+16E00 MWANGWEGO MUSISI A
	U+16E01 MWANGWEGO MUSISI BA
	U+16E02 MWANGWEGO MUSISI CHA
	U+16E03 MWANGWEGO MUSISI DA
	U+16E04 MWANGWEGO MUSISI FA
	U+16E05 MWANGWEGO MUSISI GA
	U+16E06 MWANGWEGO MUSISI GHA
	U+16E07 MWANGWEGO MUSISI HA
	U+16E08 MWANGWEGO MUSISI JA
	U+16E09 MWANGWEGO MUSISI ZHA
	U+16E0A MWANGWEGO MUSISI KA
	U+16E0B MWANGWEGO MUSISI LA
	U+16E0C MWANGWEGO MUSISI MA
	U+16E0D MWANGWEGO MUSISI NA

	U+16E0E MWANGWEGO MUSISI NYA
	U+16E0F MWANGWEGO MUSISI PA
	U+16E10 MWANGWEGO MUSISI RA
	U+16E11 MWANGWEGO MUSISI SA
	U+16E12 MWANGWEGO MUSISI SHA
	U+16E13 MWANGWEGO MUSISI TA
	U+16E14 MWANGWEGO MUSISI TSA
	U+16E15 MWANGWEGO MUSISI PSA
	U+16E16 MWANGWEGO MUSISI VA
	U+16E17 MWANGWEGO MUSISI WA
	U+16E18 MWANGWEGO MUSISI YA
	U+16E19 MWANGWEGO MUSISI ZA
	U+16E1A MWANGWEGO MUSISI DZA
	U+16E1B MWANGWEGO MUSISI DHLA
	U+16E1C MWANGWEGO MUSISI HLA
	U+16E1D MWANGWEGO MUSISI XA
	U+16E1E MWANGWEGO MUSISI QA
	U+16E1F MWANGWEGO MUSISI THA
	U+16E20 MWANGWEGO SIRI EMWA
	U+16E21 MWANGWEGO SIRI IMA
	U+16E22 MWANGWEGO SIRI OTA
	U+16E23 MWANGWEGO SIRI UYU
	U+16E24 MWANGWEGO MUTUYO MYU
	U+16E25 MWANGWEGO MUTUYO MI
	U+16E26 MWANGWEGO MUTUYO NI
	U+16E27 MWANGWEGO MUTUYO HI
	U+16E28 MWANGWEGO MUTUYO WAYA
	U+16E29 MWANGWEGO MUTUYO WAYA BELOW
	U+16E2A MWANGWEGO MUTUYO SISA
	U+16E2B MWANGWEGO MUTUYO MURA
	U+16E2C MWANGWEGO MUTUYO MULA
	U+16E2D MWANGWEGO MUTUYO PEWA
	U+16E2E MWANGWEGO MUTUYO TUMBU
	U+16E2F MWANGWEGO MUTUYO KWANTHU
	U+16E30 MWANGWEGO MITUYO MYU-NI

	U+16E31 MWANGWEGO MITUYO MYU-HI
	U+16E32 MWANGWEGO MITUYO MYU-WAYA
	U+16E33 MWANGWEGO MITUYO MI-HI
	U+16E34 MWANGWEGO MITUYO MI-WAYA
	U+16E35 MWANGWEGO MITUYO NI-HI
	U+16E36 MWANGWEGO MITUYO NI-WAYA
	U+16E37 MWANGWEGO MITUYO HI-WAYA
	U+16E38 MWANGWEGO MITUYO SISA-NI
	U+16E39 MWANGWEGO MITUYO TUMBU-WAYA
	U+16E3A MWANGWEGO MITUYO MYU-NI-HI
	U+16E3B MWANGWEGO MITUYO MYU-HI-WAYA
	U+16E3C MWANGWEGO MITUYO MI-HI-WAYA
	U+16E3D MWANGWEGO MITUYO NI-HI-WAYA
	U+16E3E MWANGWEGO MITUYO SISA-NI-HI
	U+16E3F MWANGWEGO MITUYO MYU-NI-HI-WAYA

Table 3. Character Names of the Mwangwego Orthography

The Mwangwego script is used for the languages of Malawi, which include Chewa (nya), Lomwe (ngl), Sena (swk in Malawi, seh in Mozambican, bwg for the divergent Barwe dialect), Tonga (tog), Tumbuka (tum), Yao (yao), Nyakyusa (nyy).


16E0
16E1
16E2
16E3
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
16E00
16E10
16E20
16E30
16E01
16E11
16E21
16E31
16E02
16E12
16E22
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16E33
16E04
16E14
16E24
16E34
16E05
16E15
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16E16
16E26
16E36
16E07
16E17
16E27
16E37
16E08
16E18
16E28
16E38
16E09
16E19
16E29
16E39
16E0A
16E1A
16E2A
16E3A
16E0B
16E1B
16E2B
16E3B
16E0C
16E1C
16E2C
16E3C
16E0D
16E1D
16E2D
16E3D
16E0E
16E1E
16E2E
16E3E
16E0F
16E1F
16E2F
16E3F

Musisi

16E00	MWANGWEGO MUSISI A
16E01	MWANGWEGO MUSISI BA
16E02	MWANGWEGO MUSISI CHA
16E03	MWANGWEGO MUSISI DA
16E04	MWANGWEGO MUSISI FA
16E05	MWANGWEGO MUSISI GA
16E06	MWANGWEGO MUSISI GHA
16E07	MWANGWEGO MUSISI HA
16E08	MWANGWEGO MUSISI JA
16E09	MWANGWEGO MUSISI ZHA
16E0A	MWANGWEGO MUSISI KA
16E0B	MWANGWEGO MUSISI LA
16E0C	MWANGWEGO MUSISI MA
16E0D	MWANGWEGO MUSISI NA
16E0E	MWANGWEGO MUSISI NYA
16E0F	MWANGWEGO MUSISI PA
16E10	MWANGWEGO MUSISI RA
16E11	MWANGWEGO MUSISI SA
16E12	MWANGWEGO MUSISI SHA
16E13	MWANGWEGO MUSISI TA
16E14	MWANGWEGO MUSISI TSA
16E15	MWANGWEGO MUSISI PSA
16E16	MWANGWEGO MUSISI VA
16E17	MWANGWEGO MUSISI WA
16E18	MWANGWEGO MUSISI YA
16E19	MWANGWEGO MUSISI ZA
16E1A	MWANGWEGO MUSISI DZA
16E1B	MWANGWEGO MUSISI DHLA
16E1C	MWANGWEGO MUSISI HLA
16E1D	MWANGWEGO MUSISI XA
16E1E	MWANGWEGO MUSISI QA
16E1F	MWANGWEGO MUSISI THA

Siri

16E20	MWANGWEGO SIRI EMWA
16E21	MWANGWEGO SIRI ITA
16E22	MWANGWEGO SIRI OTA
16E23	MWANGWEGO SIRI UYU

Mutuyo

16E24	MWANGWEGO MUTUYO MYU
16E25	MWANGWEGO MUTUYO MI
16E26	MWANGWEGO MUTUYO NI
16E27	MWANGWEGO MUTUYO HI
16E28	MWANGWEGO MUTUYO WAYA
16E29	MWANGWEGO MUTUYO WAYA BELOW
16E2A	MWANGWEGO MUTUYO SISA
16E2B	MWANGWEGO MUTUYO MURA
16E2C	MWANGWEGO MUTUYO MULA
16E2D	MWANGWEGO MUTUYO PEWA
16E2E	MWANGWEGO MUTUYO TUMBU
16E2F	MWANGWEGO MUTUYO KWANTHU

Mituyo

16E30	MWANGWEGO MITUYO MYU-NI
16E31	MWANGWEGO MITUYO MYU-HI
16E32	MWANGWEGO MITUYO MYU-WAYA
16E33	MWANGWEGO MITUYO MI-HI
16E34	MWANGWEGO MITUYO MI-WAYA
16E35	MWANGWEGO MITUYO NI-HI
16E36	MWANGWEGO MITUYO NI-WAYA
16E37	MWANGWEGO MITUYO HI-WAYA
16E38	MWANGWEGO MITUYO SISA-NI
16E39	MWANGWEGO MITUYO TUMBU-WAYA
16E3A	MWANGWEGO MITUYO MYU-NI-HI
16E3B	MWANGWEGO MITUYO MYU-HI-WAYA
16E3C	MWANGWEGO MITUYO MI-HI-WAYA
16E3D	MWANGWEGO MITUYO NI-HI-WAYA
16E3E	MWANGWEGO MITUYO SISA-NI-HI
16E3F	MWANGWEGO MITUYO MYU-NI-HI-WAYA

Additional information on characters

Phonetic value

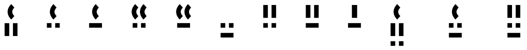
The Mutuyo TUMBU ˈ is only used for Yao, and Nyakyusa/Ngonde. The Mutuyo PEWA ◌̂ is mostly used in Tumbuka, Kyangonde (a dialect of Nyakyusa; possibly other Nyakyusa dialects as well), and Yao.

Joining information

Masiri (e.g., Vowel modifiers; singular: Siri) are attached to base letters as described above, but letters themselves do not join at all like they do in Arabic.

For the MUSISI BA (Ʊ), and the Misiri counterparts (ƱL, Ʊı, Ʊb, Ʊr), placement of the Mutuyo PEWA ◌̂ should be above the right-side vertical line (Ʊ̂ ƱL̂ Ʊı̂ Ʊb̂ Ʊr̂), instead of directly above the grapheme as it is for all other graphemes (e.g., Ĥ, ʃ̂). See line 3 of Figure 42 in Section IX.

Note for typographers/font designers: the placement of the Mutuyo/Mituyo in relation to the graphemes (Misisi/Misiri) should be done the same as in Figures 10-31 and 42-50 in Section IX. These images should be the reference when making basic letterforms and relative position of most Mutuyo/Mituyo to the graphemes. The following are exceptions to this based on input by the user community:

- When Mutuyo/Mituyo that appear on the left of MUSISI PA ɗ, MUSISI TA ʅ, MUSISI TSA ʃ, and MUSISI DHLA ∂, and their Musiri counterparts (), should make use of the empty space available for these graphemes. They should "fill up"/utilize the empty space. Again, this logic extends to the Misiri counterparts for these 4 graphemes.
    - See Figure 46 for MUSISI PA ɗ. Same for Misiri ɗL, ɗı, ɗb, ɗr.
    - See Figures 49-50 for MUSISI TA ʅ. Same for Misiri ʅL, ʅı, ʅb, ʅr.
    - See Figure 50 for MUSISI TSA ʃ. Same for Misiri ʃL, ʃı, ʃb, ʃr.
    - See Figure 51 for MUSISI DHLA ∂. Same for Misiri ∂L, ∂ı, ∂b, ∂r.
- The stacked Mituyo combinations on the left of graphemes should be perfectly symmetrical as requested by the user community:
    - Symmetrical examples: 
    - The font used in Figures 42-50 doesn't have some aspects of a Mituyo stack centered, such as Mutuyo MYU ʿ. The examples above should be the reference for this aspect of the script/future fonts.

Punctuation

Latin punctuation is used in the script. This includes the "ASCII punctuation and symbols" subheading of Basic Latin Unicode Block (U+0020 to U+002F, U+003A to U+0040, U+005B to U+0060 and U+007B to U+007E) and the "Latin-1 punctuation and symbols" subheading of the Latin-1 Supplement Unicode Block (U+00A0 to U+00BF).

Numbers

Numbers are represented with Hindu-Arabic numerals: 0123456789.

Mutuyo glyph uniqueness:

Many Mutuyo glyphs are visually similar to existing diacritical marks presently in the Unicode inventory. The authors have considered utilization of the graphically similar marks with the Mwangwego letters and determined that doing so is not in the best interests of the user community. While the marks are graphically similar, the abstract characters that the graphs are referents for are distinctly different; which in turn would lead to cognition difficulties in their Mwanwego utilization. A discussion and comparison of the diacritic and Mutuyo marks is given in the following.

The Chichewa and other languages of Malawi use a Latin-based orthography that includes "ŵ" to denote the voiced bilabial fricative /β/. Accordingly, the user community is already familiar with the shape of the mark and its phonetical augmentation to /w/. Circumflex applied to letters of the Mwangwego script would *not* signal the *same* phonetic change. Not only might this inconsistency in the use of the symbol be confusing to users, but visually the Latin circumflex is not optimal for publishing in Mwanwego script. The visual difference between the symbols is depicted in the following tables:

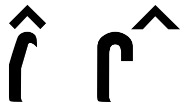
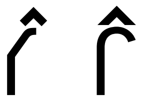
Reference Typeface	Ŵ ŵ	
Sans Serif Typeface	Ŵ ŵ	

Table 4. Comparison of Chichewa Latin Circumflex on Ŵ to Mutuyo Pewa.

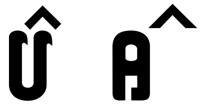
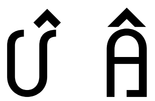
Reference Typeface	Û Â	
Sans Serif Typeface	Û Â	

Table 5. Comparison of Circumflex to Mutuyo Pewa applied to similarly shaped base letters.

Visible differences between the shapes of Circumflex and Pewa in the above examples include: stroke weight, stroke taper, inner angle, top angle, and mark positioning.

It can be expected that materials, particularly educational, will be produced that render Malawi languages in both orthographies. For these readers we believe that not conflating Circumflex and Pewa, for example, would better facilitate reading comprehension and the visual quality of publications. Maintaining the visual distinction between the symbols is also advantageous in any pain text context.

Unlike the practice with Latin diacritic, the combining Mutuyo do not change the phonetic value of a consonant letter (e.g. n + ◌̃ → ñ , phonetically /n/ → / ɲ/). Rather, they either append or prefix a phoneme to the consonant (note that with a single exception, the *non*-combining Mutuyo will prefix a phoneme).

For example:

- Ʒ (da) *vs* Ʒ̱ (dya)
- Ʊ (ba) *vs* Ʊ̏ (bra)
- ʔ (ka) *vs* ʔ̀ (kla)
- ɾ (za) *vs* ɾ̂ (bza)
- Ʒɹ (di) *vs* Ʒ́ɹ (ndi)

A noteworthy distinction between the application of the combining Mutuyo, that is unprecedented for the diacritical marks, appears in the last example above. The Mutuyo mark is the third glyph in the composition sequence. In keeping with the handwritten practices, the Mutuyo is written *after* the Masiri vowel mark while it visually appears above the consonant glyph -no different than when a Masiri is not present. Thus, the combining Mutuyo may be either the 2nd or 3rd codepoint in composed character (e.g. <C><M> or <C><V><M>). This is believed to be a different combining behavior than that exhibited by comparable diacritical marks which will always be the 2nd codepoint in a composition sequence (unless combining with another combinable mark).

This last point helps highlight that Latin based combining marks may be inherently unsuitable for Mwanwego script which, being an Abugida script, is not sufficiently *Latin-like*. Review of the Unicode Character Database's "NormalizationTest.txt" finds the comparable marks applied only to the more closely related scripts Latin, Greek, and Cyrillic. Applying the marks outside of this family may also be problematic for existing text processors that make the assumption that the marks are erroneously applied when found elsewhere.

A degree of internal similarity to the Mutuyo mark is readily observed. For example: ᶜ (MYU) with ᶜᶜ (MI), ' (TUMBA) with " (NI), and ◌̀ (MULA) with ◌̏ (MURA). Discussion with the user community and educators we find that users embody a phonological understanding of the glyphs and do not apply the visual similarity in any practical way. For example, MI (ᶜ) is not perceived as a "Double MYU" (ᶜᶜ) which is not logical phonetically. Education of the marks also does not follow what would logically be the "stroke order" of the glyphs (◌̏ NI precedes ◌̀ TUMBI, ' MURA precedes " MULA). Thus we have proposed encoding the marks distinctly in keeping with the user communities perception and practices. Doing so also avoids entirely the inevitable problem of text editing where during a "copy & paste" operation, one mark is selected and pasted but not the other, or a deletion is incomplete, or a second keystroke missed in their composition.

V Properties

General Category and other properties

The Mwangwego inventory in this proposal includes the Misisi syllable bases as type Letter Other, their combining Masiri and Mutuyo diacritic marks.

```
16E00;MWANGWEGO MUSISI A;Lo;0;L;;;;;N;;;;;
16E01;MWANGWEGO MUSISI BA;Lo;0;L;;;;;N;;;;;
16E02;MWANGWEGO MUSISI CHA;Lo;0;L;;;;;N;;;;;
16E03;MWANGWEGO MUSISI DA;Lo;0;L;;;;;N;;;;;
16E04;MWANGWEGO MUSISI FA;Lo;0;L;;;;;N;;;;;
16E05;MWANGWEGO MUSISI GA;Lo;0;L;;;;;N;;;;;
16E06;MWANGWEGO MUSISI GHA;Lo;0;L;;;;;N;;;;;
16E07;MWANGWEGO MUSISI HA;Lo;0;L;;;;;N;;;;;
16E08;MWANGWEGO MUSISI JA;Lo;0;L;;;;;N;;;;;
16E09;MWANGWEGO MUSISI ZHA;Lo;0;L;;;;;N;;;;;
16E0A;MWANGWEGO MUSISI KA;Lo;0;L;;;;;N;;;;;
16E0B;MWANGWEGO MUSISI LA;Lo;0;L;;;;;N;;;;;
16E0C;MWANGWEGO MUSISI MA;Lo;0;L;;;;;N;;;;;
16E0D;MWANGWEGO MUSISI NA;Lo;0;L;;;;;N;;;;;
16E0E;MWANGWEGO MUSISI NYA;Lo;0;L;;;;;N;;;;;
16E0F;MWANGWEGO MUSISI PA;Lo;0;L;;;;;N;;;;;
16E10;MWANGWEGO MUSISI RA;Lo;0;L;;;;;N;;;;;
16E11;MWANGWEGO MUSISI SA;Lo;0;L;;;;;N;;;;;
16E12;MWANGWEGO MUSISI SHA;Lo;0;L;;;;;N;;;;;
16E13;MWANGWEGO MUSISI TA;Lo;0;L;;;;;N;;;;;
16E14;MWANGWEGO MUSISI TSA;Lo;0;L;;;;;N;;;;;
16E15;MWANGWEGO MUSISI PSA;Lo;0;L;;;;;N;;;;;
16E16;MWANGWEGO MUSISI VA;Lo;0;L;;;;;N;;;;;
16E17;MWANGWEGO MUSISI WA;Lo;0;L;;;;;N;;;;;
16E18;MWANGWEGO MUSISI YA;Lo;0;L;;;;;N;;;;;
16E19;MWANGWEGO MUSISI ZA;Lo;0;L;;;;;N;;;;;
16E1A;MWANGWEGO MUSISI DZA;Lo;0;L;;;;;N;;;;;
16E1B;MWANGWEGO MUSISI DHLA;Lo;0;L;;;;;N;;;;;
16E1C;MWANGWEGO MUSISI HLA;Lo;0;L;;;;;N;;;;;
16E1D;MWANGWEGO MUSISI XA;Lo;0;L;;;;;N;;;;;
16E1E;MWANGWEGO MUSISI QA;Lo;0;L;;;;;N;;;;;
16E1F;MWANGWEGO MUSISI THA;Lo;0;L;;;;;N;;;;;
16E20;MWANGWEGO SIRI EMWA;Mc;204;L;;;;;N;;;;;
16E21;MWANGWEGO SIRI IMA;Mc;204;L;;;;;N;;;;;
16E22;MWANGWEGO SIRI OTA;Mc;204;L;;;;;N;;;;;
16E23;MWANGWEGO SIRI UYU;Mc;204;L;;;;;N;;;;;
16E24;MWANGWEGO MUTUYO MYU;Lm;0;ON;;;;;N;;;;;
16E25;MWANGWEGO MUTUYO MI;Lm;0;ON;;;;;N;;;;;
16E26;MWANGWEGO MUTUYO NI;Lm;0;ON;;;;;N;;;;;
16E27;MWANGWEGO MUTUYO HI;Lm;0;ON;;;;;N;;;;;
16E28;MWANGWEGO MUTUYO WAYA;Lm;0;ON;;;;;N;;;;;
16E29;MWANGWEGO MUTUYO WAYA BELOW;Mn;220;ON;;;;;N;;;;;
16E2A;MWANGWEGO MUTUYO SISA;Lm;0;ON;;;;;N;;;;;
16E2B;MWANGWEGO MUTUYO MURA;Mn;230;ON;;;;;N;;;;;
16E2C;MWANGWEGO MUTUYO MULA;Mn;230;ON;;;;;N;;;;;
16E2D;MWANGWEGO MUTUYO PEWA;Mn;230;ON;;;;;N;;;;;
16E2E;MWANGWEGO MUTUYO TUMBU;Lm;0;ON;;;;;N;;;;;
```

```
16E2F;MWANGWEGO MUTUYO KWANTHU;Mn;230;ON;;;;;N;;;;;
16E30;MWANGWEGO MITUYO MYU-NI;Lm;0;L;;;;;N;;;;;
16E31;MWANGWEGO MITUYO MYU-HI;Lm;0;L;;;;;N;;;;;
16E32;MWANGWEGO MITUYO MYU-WAYA;Lm;0;ON;;;;;N;;;;;
16E33;MWANGWEGO MITUYO MI-HI;Lm;0;ON;;;;;N;;;;;
16E34;MWANGWEGO MITUYO MI-WAYA;Lm;0;ON;;;;;N;;;;;
16E35;MWANGWEGO MITUYO NI-HI;Lm;0;ON;;;;;N;;;;;
16E36;MWANGWEGO MITUYO NI-WAYA;Lm;0;ON;;;;;N;;;;;
16E37;MWANGWEGO MITUYO HI-WAYA;Lm;0;ON;;;;;N;;;;;
16E38;MWANGWEGO MITUYO SISA-NI;Lm;0;ON;;;;;N;;;;;
16E39;MWANGWEGO MITUYO TUMBU-WAYA;Lm;0;ON;;;;;N;;;;;
16E3A;MWANGWEGO MITUYO MYU-NI-HI;Lm;0;L;;;;;N;;;;;
16E3B;MWANGWEGO MITUYO MYU-HI-WAYA;Lm;0;ON;;;;;N;;;;;
16E3C;MWANGWEGO MITUYO MI-HI-WAYA;Lm;0;ON;;;;;N;;;;;
16E3D;MWANGWEGO MITUYO NI-HI-WAYA;Lm;0;ON;;;;;N;;;;;
16E3E;MWANGWEGO MITUYO SISA-NI-HI;Lm;0;ON;;;;;N;;;;;
16E3F;MWANGWEGO MITUYO MYU-NI-HI-WAYA;Lm;0;L;;;;;N;;;;;
```

Line breaking information

Line Breaking rules for the Mwangwego script are as follows:

- Words are separated with U+0020 SPACE. There are no other word separators in historical documents.
- Line breaks only occur at word boundaries.
- There is not a special mode found that allows line breaks within words at select positions, such as using a hyphen sign (U+002D HYPEHN-MINUS) that other scripts apply.
- Line breaks cannot occur within numbers. Numbers must always be kept together.
- There are no restrictions explicitly stated on line breaking before or after certain punctuation characters.

The Mwangwego script is likely to occur with the Latin script.

VI Collation

Misisi/Musiri

The sorting order of the basic syllabic graphemes of the script follows the ordering used in education and is shown in Table 1, starting with [illegible], [illegible], [illegible], [illegible], [illegible], then [illegible], [illegible], [illegible], [illegible], [illegible], …, all the way to [illegible], [illegible], [illegible], [illegible], [illegible].

However, attaching Mutuyo/Mituyo to Misisi/Musiri significantly influences the ordering of said Misisi/Musiri; see directly below.

Mutuyo

When Mutuyo (i.e., a single modifying mark as defined in Section III) are attached to Misisi/Musiri the collation adheres to the following order:

MYU ʻ < MI “ < NI " < HI ¨ < WAYA ˗ < WAYA BELOW ◌̱ < SISA ʼ < MURA ◌̏ < MULA ◌̀ < PEWA ◌̂ < TUMBU ˈ < KWANTHU ◌́.

As previously mentioned, not all Mutuyo/Mituyo attach to all Misisi/Musiri as some letter+modifier combinations are not linguistically attested. For example, the valid Mutuyo for the Musisi ʔ /ka/ are MYU ʻ, NI ", HI ¨, WAYA ˗, WAYA BELOW ◌̱, SISA ʼ, and KWANTHU ◌̂. See Section X for all valid Misisi and Mutuyo/Mituyo combinations.

As an example, if one is given the Musisi ʔ /ka/ and the Musiri ƻ /kɛ/, and all valid Mutuyo attachments for ʔ, which are ˗ʔ, "ʔ, ʔ̱, ¨ʔ, ʻʔ, ʼʔ, and ʔ́ the order of these characters would be as follows:

ʔ, ʻʔ, "ʔ, ¨ʔ, ˗ʔ, ʔ̱, ʼʔ, ʔ̏, ʔ́, ƻ

The basic Musisi ʔ /ka/ is ordered first, then each base-ʔ letter is ordered according to the Mutuyo order mentioned above. Only after all letters of the same base (ʔ in this example) are ordered, can the next vocalized letter (i.e., ƻ /kɛ/) be ordered.

To provide another example: if one is given the Musisi Ʊ /ba/ and the Misiri Ա /bɛ/, Ɯ /bi/, Ƅ /bɔ/, and Ʉ /bu/. The valid Mutuyo for Ʊ /ba/ (which are also ***always*** valid for the Misiri counterparts) are MYU ʻ, MI “, WAYA ˗, WAYA BELOW ◌̱, MURA ◌̏, MULA ◌̀, and PEWA ◌̂ (see Section X). If you attach all Mutuyo to Musisi Ʊ /ba/ and all Misiri, the ordering of all of these characters, including the base Musisi and Misiri, would be as follows:

Ʊ < ʻƱ < “Ʊ < ˗Ʊ < Ʊ̱ < Ʊ̏ < Ʊ̀ < Ʊ̂ < Ա < ʻԱ < “Ա < ˗Ա < Ա̱ < Ա̏ < Ա̀ < Ա̂ < Ɯ < ʻƜ < “Ɯ < ˗Ɯ < Ɯ̱ < Ɯ̏ < Ɯ̀ < Ɯ̂ < Ƅ < ʻƄ < “Ƅ < ˗Ƅ < Ƅ̱ < Ƅ̏ < Ƅ̀ < Ƅ̂ < Ʉ < ʻɄ < “Ʉ < ˗Ʉ < Ʉ̱ < Ʉ̏ < Ʉ̀ < Ʉ̂

Mituyo

Graphemes with only one Mutuyo are ordered before any instances of a grapheme with Mituyo (i.e., multiple Mutuyo).

There are only three ways to configure a Mituyo combination around a Musisi/letter:

1. **Left** and Bottom (example: "(̱)
2. **Top** and Left (example: ˗(̂)
3. **Top** and Bottom (example: (̱̂)

You cannot have a Mituyo configuration where all three positions (top, left, and bottom) are occupied by a Mutuyo (i.e., it is linguistically impossible for these languages). The Mutuyo that is written first, and therefore considered first when ordering is in **bold** above for each of the three configurations.

Furthermore, if there are multiple Mutuyo stacked on the left of a grapheme (e.g., "Ƴ, ¦Ƴ) ordering of the left stack is decided by reading the individual Mutuyo from the top of the stack (first) to the bottom of the stack(second), and adhering to the general ordering of individual Mutuyo

2-part Mituyo

Below are all 19 linguistically possible 2-part Mituyo combinations. This is also their order (from left to right):

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ʻ"	ʻ¨	ʻ-	ʻ◌̱	“¨	“-	“◌̱	"¨	"-	"◌̱	¨-	¨◌̱	ʼ"	"◌̂	-◌̂	◌̱̂	ˈ-	ˈ◌̱	"◌́

Table 6. Order of all 2-part Mituyo.

For convenience, the order of individual Mutuyo is: MYU ʻ < MI “ < NI " < HI ¨ < WAYA - < WAYA BELOW ◌̱ < SISA ʼ < MURA ◌̏ < MULA ◌̀ < PEWA ◌̂ < TUMBU ˈ < KWANTHU ◌́.

Therefore, we can see in Table 6 that all 2-part Mituyo that contain a MYU ʻ are ordered first before 2-part Mituyo that “start with” a MI “, etc.

Furthermore, as we can see in Table 6, the 2-part Mituyo combinations that are labeled as 1, 2, and 3 are all “stacks” that would appear on the left side of a grapheme. Stacks 1, 2, and 3 all have a MYU ʻ at the top of their stacks. The ordering of these 3 stacks is determined by parsing the stacks’ Mutuyo components from top to bottom. They each start with MYU ʻ, which can be ignored. The second Mutuyo in stacks 1, 2, and 3 are NI ", HI ¨, and WAYA -,respectively. As NI " comes before HI ¨ and WAYA - in the Mutuyo ordering, ʻ" is ordered before ʻ¨ and ʻ-. Then, as HI ¨ comes before WAYA - in the Mutuyo ordering, ʻ¨ is ordered before ʻ-.

Another example are the 2-part Mituyo combinations labeled under 14, 15, and 16 in Table 6 ("◌̂, -◌̂, and ◌̱̂). They have top-left, top-left, and top-bottom configurations around a grapheme, respectively. They each begin with a PEWA ◌̂. Their order is also determined by looking at the second Mutuyo in the Mityuo combination. Combination 14 has a NI ", 15 has a WAYA -, and 16 has a WAYA BELOW ◌̱ as their second Mutuyo (according to the order of reading their respective configurations). As NI " comes before WAYA - in the Mutuyo ordering, and WAYA - comes before WAYA BELOW ◌̱, their order as "◌̂ < -◌̂ < ◌̱̂.

3-part Mituyo

Below are the 7 linguistically possible 3-part Mituyo combinations. This is also their order (from left to right):

1	2	3	4	5	6	7
ʻ"¨	ʻ¨-	“¨-	“¨◌̱	"¨-	"¨◌̱	ʼ"¨

Table 7. Order of all 3-part Mituyo

The exact same logic applies to 3-part Mituyo.

4-part Mituyo

There is only one linguistically possible 4-part Mituyo combination. It is ordered after 3-part Mituyo combinations.

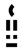
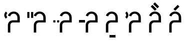
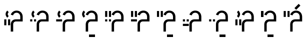
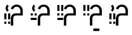
1


Table 8. The sole 4-part Mituyo combination.

The exact same logic applies to 4-part Mituyo.

Complete collation example

1. A basic grapheme (Misisi) is ordered first.
    a. Example: /ka/
2. Then all valid Mutuyo for that basic grapheme are ordered.
    a. Example: 
3. Then all valid 2-part Mutuyo for that basic grapheme are ordered.
    a. Example: 
4. Then all valid 3-part Mituyo for that basic grapheme are ordered.
    a. Example: 
5. Then all valid 4-part Mituo for that basic grapheme are ordered.
    a. Example:
6. Then the next vocalization for that basic grapheme is ordered.
    a. Example: /ke/
7. Then the ordering continues for all the same Mutuyo, and 2/3/4-part Mituyo for that new vocalized grapheme.
8. Then the next basic grapheme (Misisi) continues the entire cycle.

Section X shows every possible Mutuyo/Mituyo combination attached to the Misisi (i.e., all inherent /a/ syllabic graphemes).

VII References

1. Mwangwego, Nolence. 2011. (A Malawi tili pati? Wolemba ndi Nolensi Mose Mwangwegho). Blantyre: [self-published; printed by Blantyre Print and Packaging].
2. Everson, Michael. “Proposal to Encode the Mwangwego Script in the UCS.” The Unicode Consortium, September 25, 2012. http://www.unicode.org/wg2/docs/n4323.pdf.
3. Mwanwego, Nolence. “Part 1 Mwangwego Script.” YouTube, September 18, 2015. https://youtu.be/ShOzBdgJGgo?si=dBzx4KGTWjaSDR8a.
4. Mwangwego, Nolence. “Part 2 of 4 Mwangwengo Script.” YouTube, September 18, 2015. https://youtu.be/UyzLbGVBgog?si=1Ur6qTy_74Yik3Uo.
5. Mwangwego, Nolence. “Part 3of 4 Mwangwego Script.” YouTube, September 19, 2015. https://youtu.be/uaiEJfvChSw?si=xErrtIiIloqjaXu6.
6. Mwangwego, Nolence. “Part 4 of 4 Mwangwego Script.” YouTube, September 19, 2015. https://youtu.be/rC5k-Y5RhJU?si=3lVCBYRjOmpDHLYz.
7. https://www.facebook.com/groups/455153627868133/permalink/7667291373320953/

VIII Acknowledgements

We would like to humbly thank Nolence Mwangwego and the Mwangwego script user community that have immensely helped us understand the nuances of this script.

This project was made possible in part by a grant from the Mellon Foundation to the Script Encoding Initiative at the University of California, Berkeley.

IX Examples

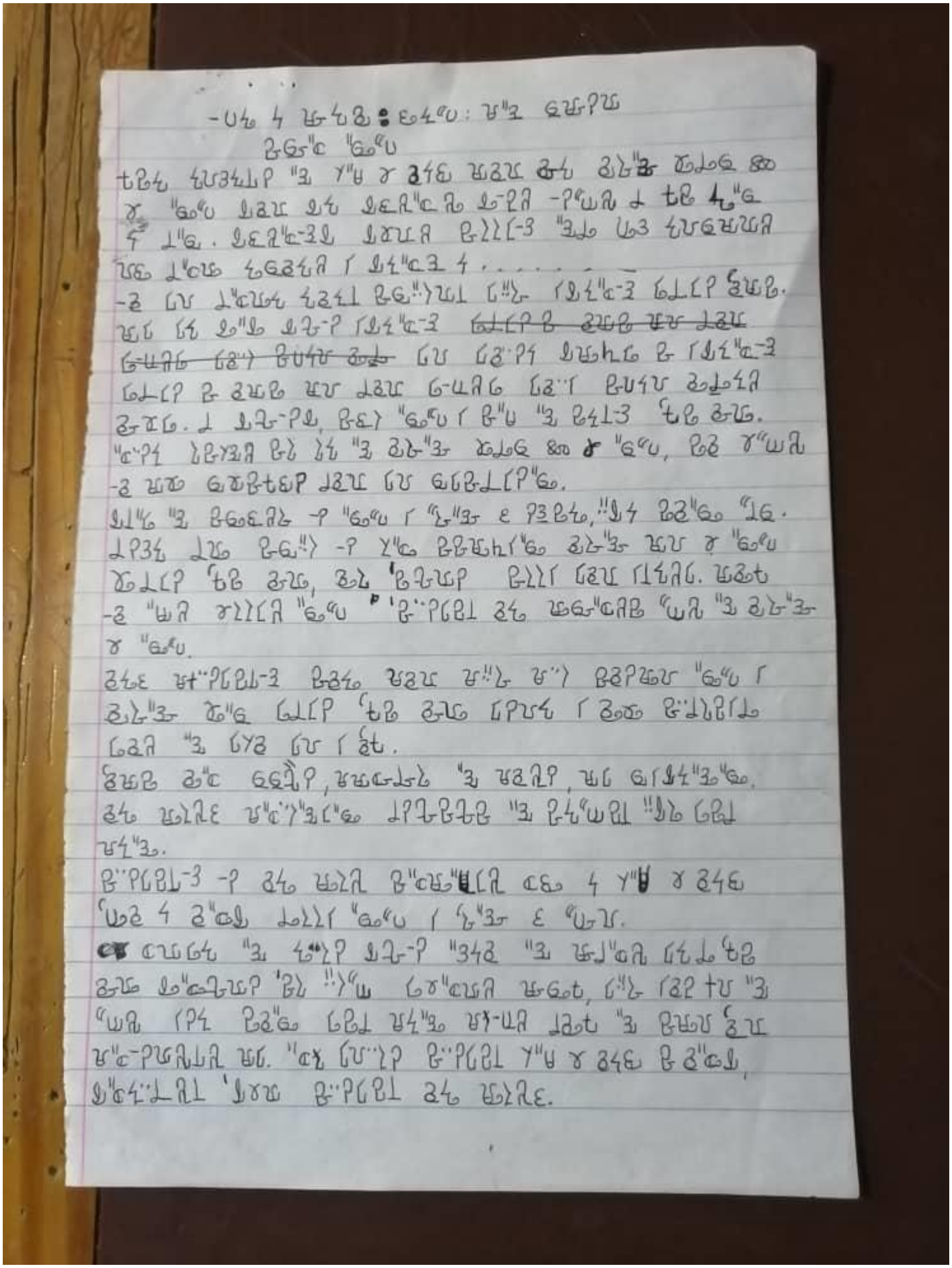


Figure 1. Handwritten Chichewa letter.

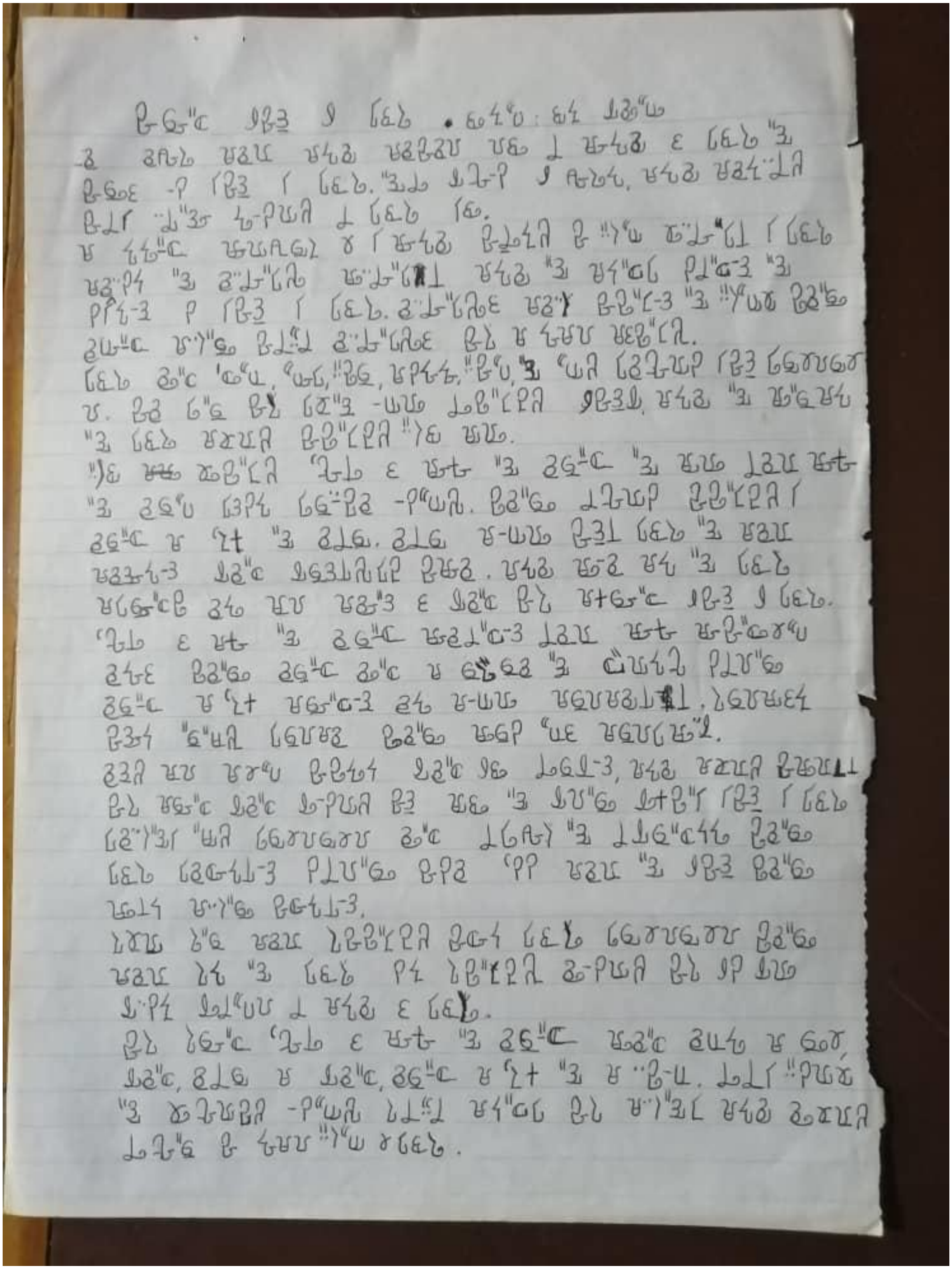


Figure 2. Handwritten Chichewa letter.

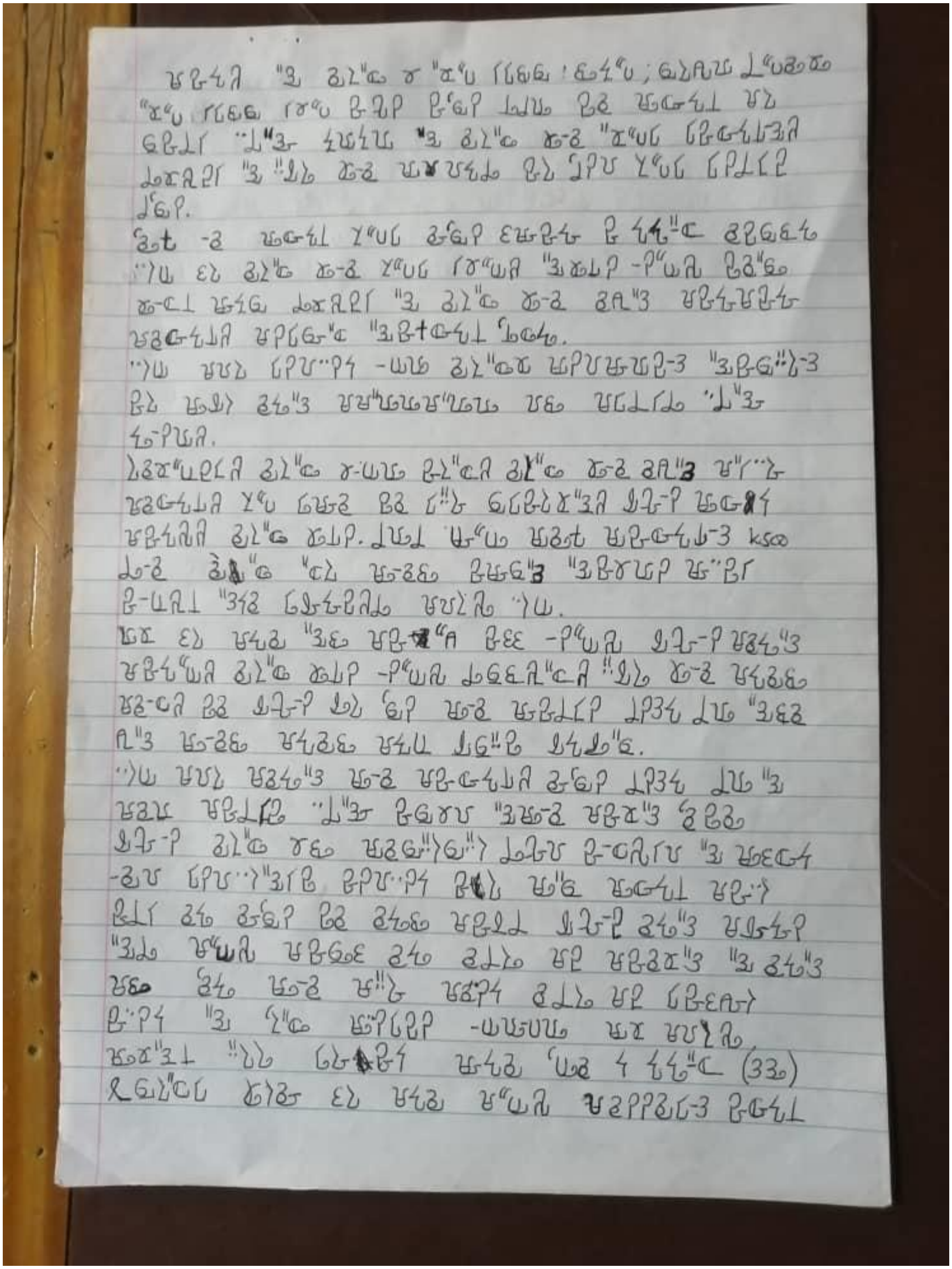


Figure 3. Handwritten Chichewa letter.

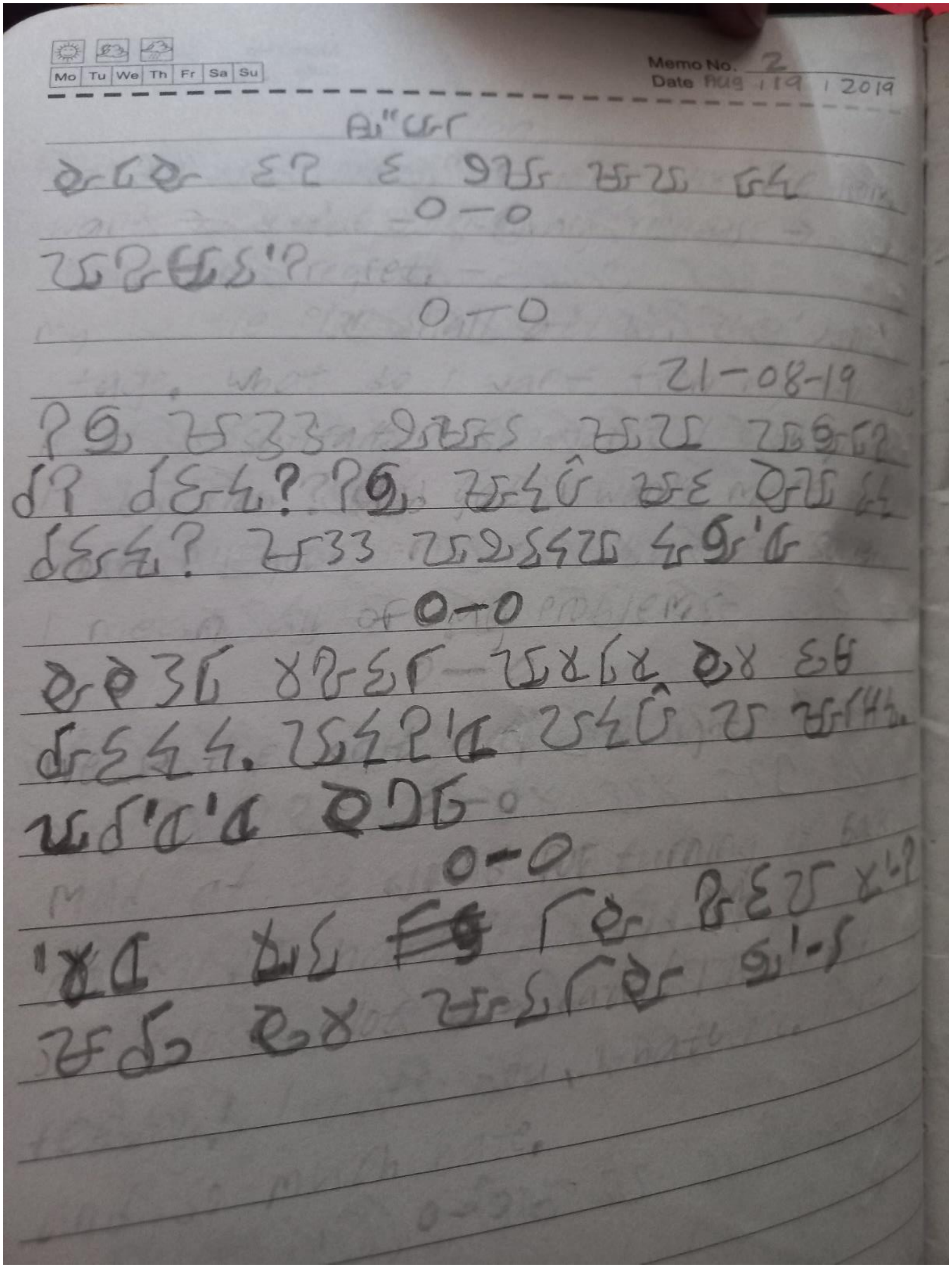

Mo Tu We Th Fr Sa Su
Memo No. 2
Date AUG 19 2019
0-0
0-0
21-08-19
0-0
0-0

Figure 4. August 19, 2019 Tumbuka-language journal entry from a Malawian user.

Please note, the last word on this image, ৭ᒧ'ʃ, has the Mituyo stack deconstructed, with the Tumbu Mutuyo incorrectly written on the left of the Waya Mutuyo, instead of properly placing it on top of the latter. This is an error the student made, which is part of the learning curve. There are several instances of the user *correctly* constructing this same Mituyo in these journal entries in Figure 4.6 (twice in paragraph 3; again in paragraph 4).

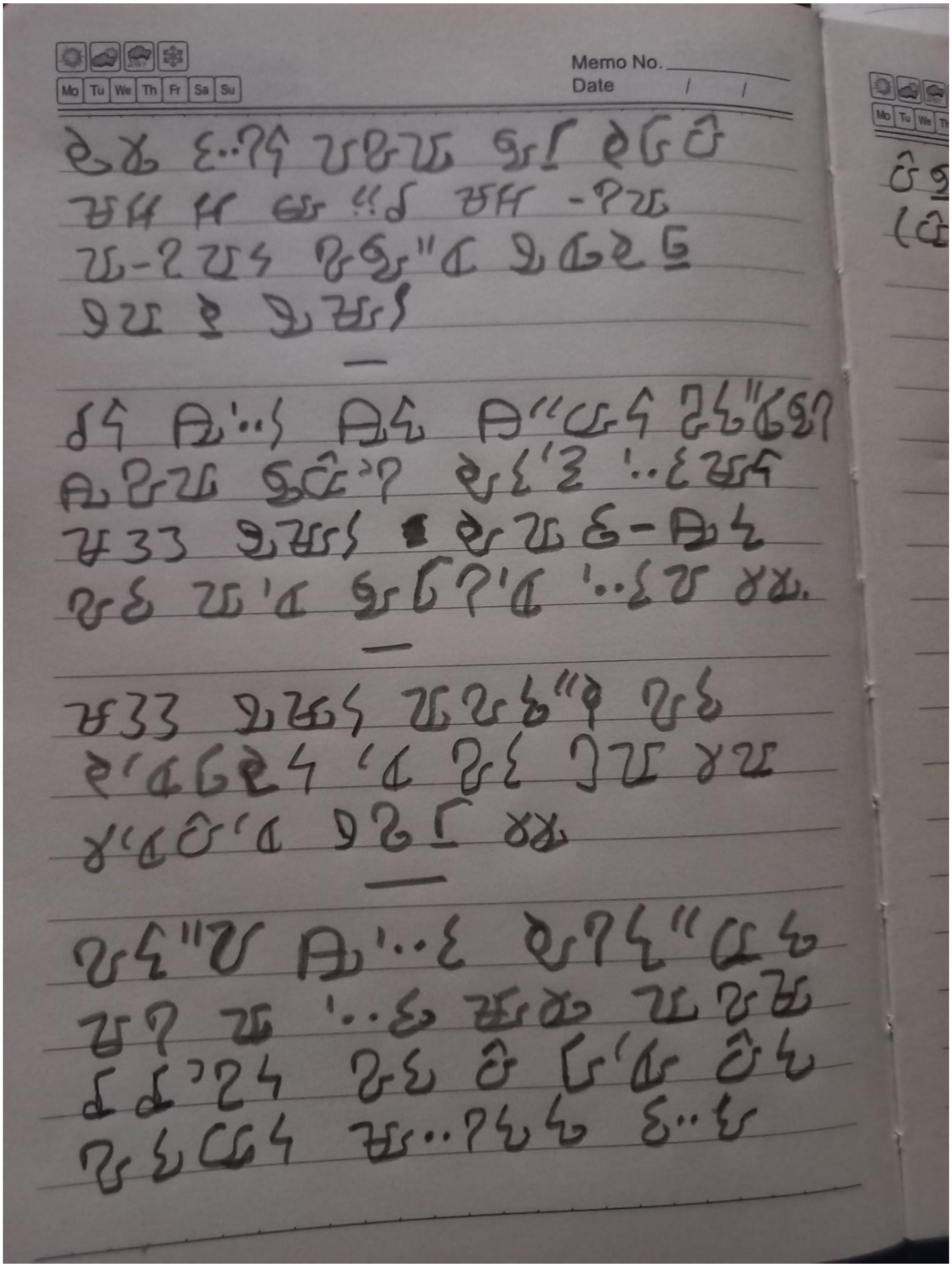

Mo
Tu
We
Th
Fr
Sa
Su
Memo No.
Date

Figure 5. Tumbuka-language journal entry from a Malawian user.

Please note, the Mituyo sequence of TUMBU ˈ HI ¨ , as seen in paragraphs 2 and 4 in Figure 4.1, is *not* possible. This was a mistake by the learner.

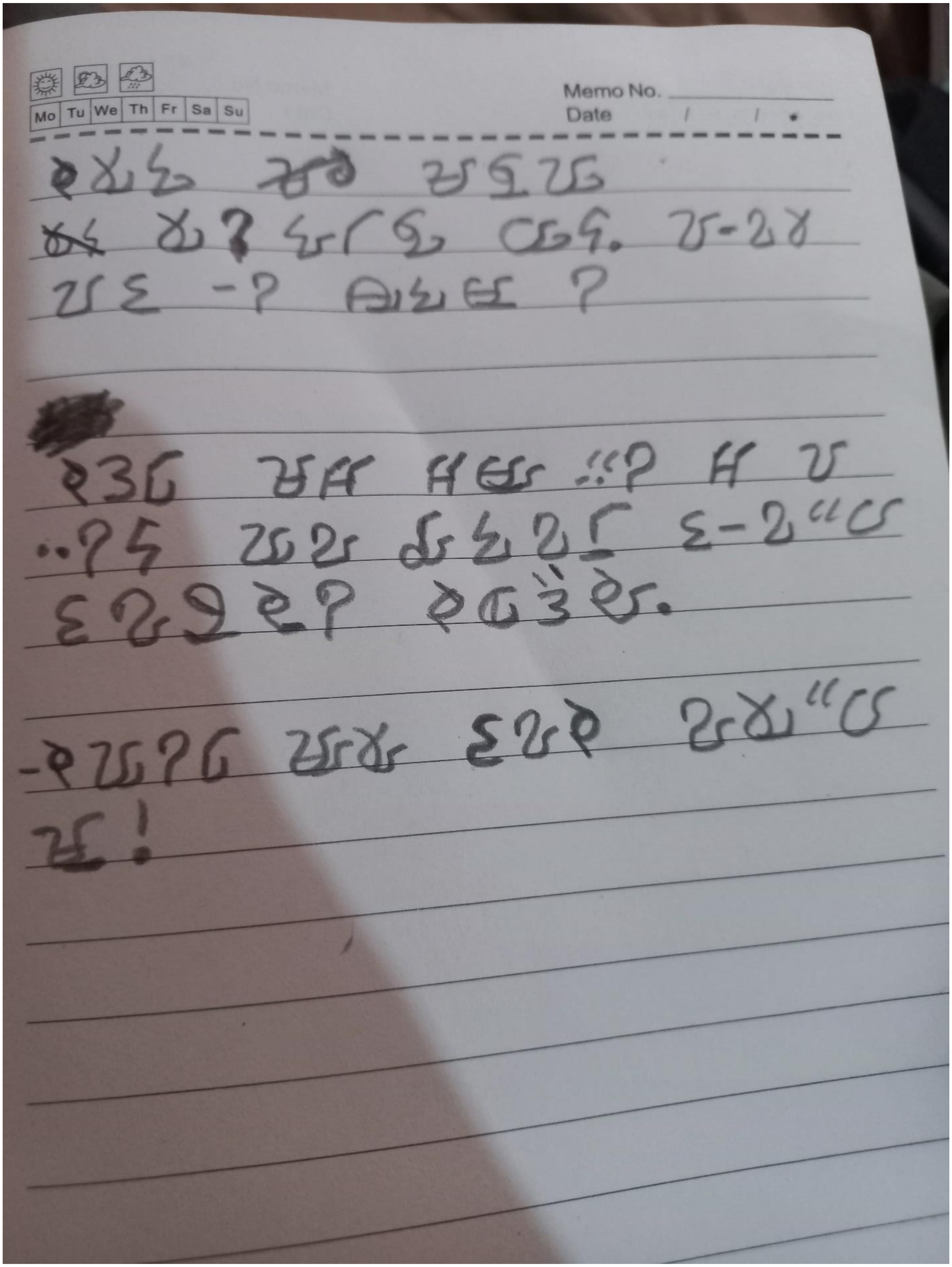
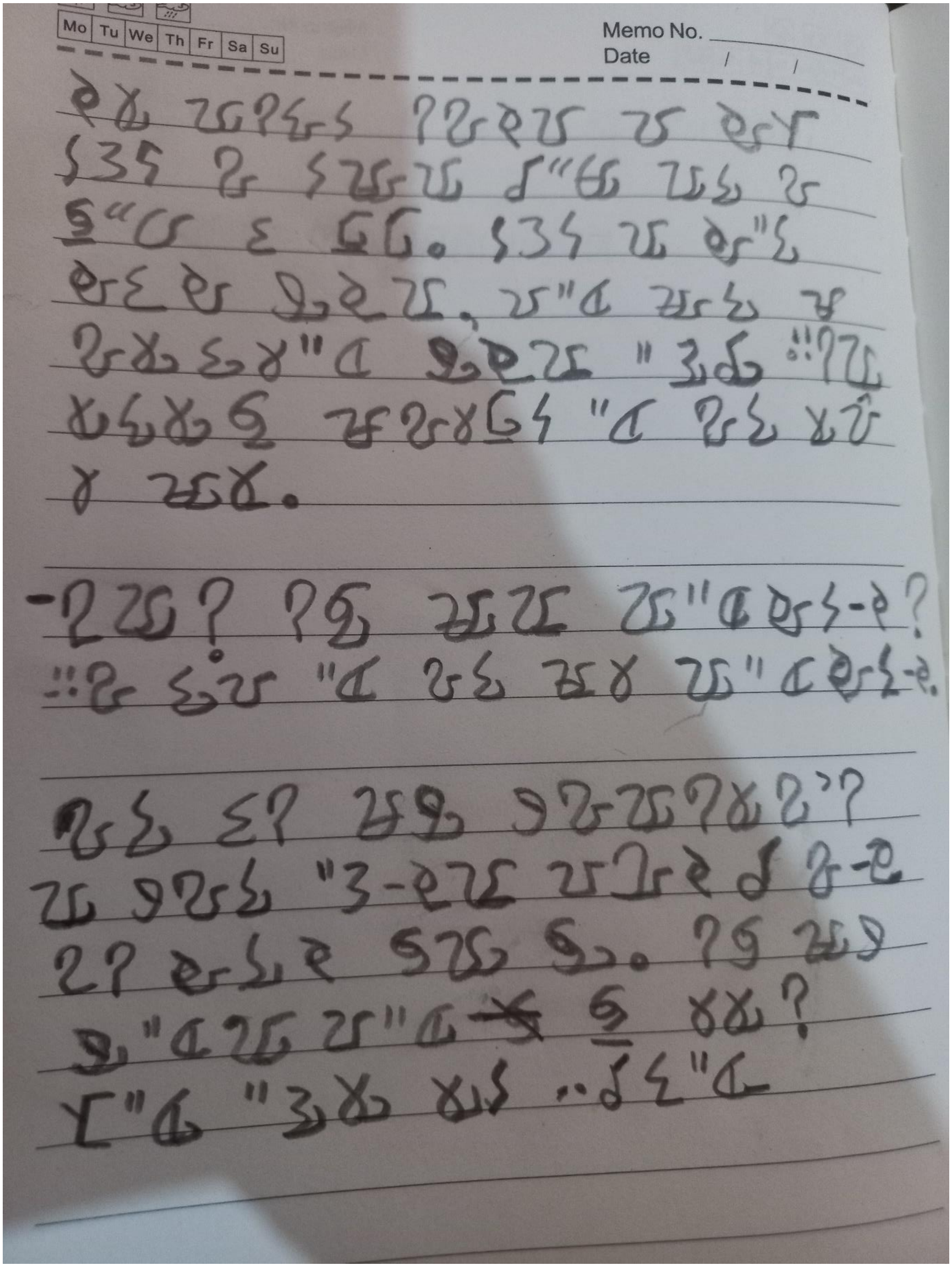

Mo Tu We Th Fr Sa Su
Memo No.
Date

Figure 6. Tumbuka-language journal entry from a Malawian user.



Mo Tu We Th Fr Sa Su
Memo No.
Date

Figure 7. Tumbuka-language journal entry from a Malawian user.

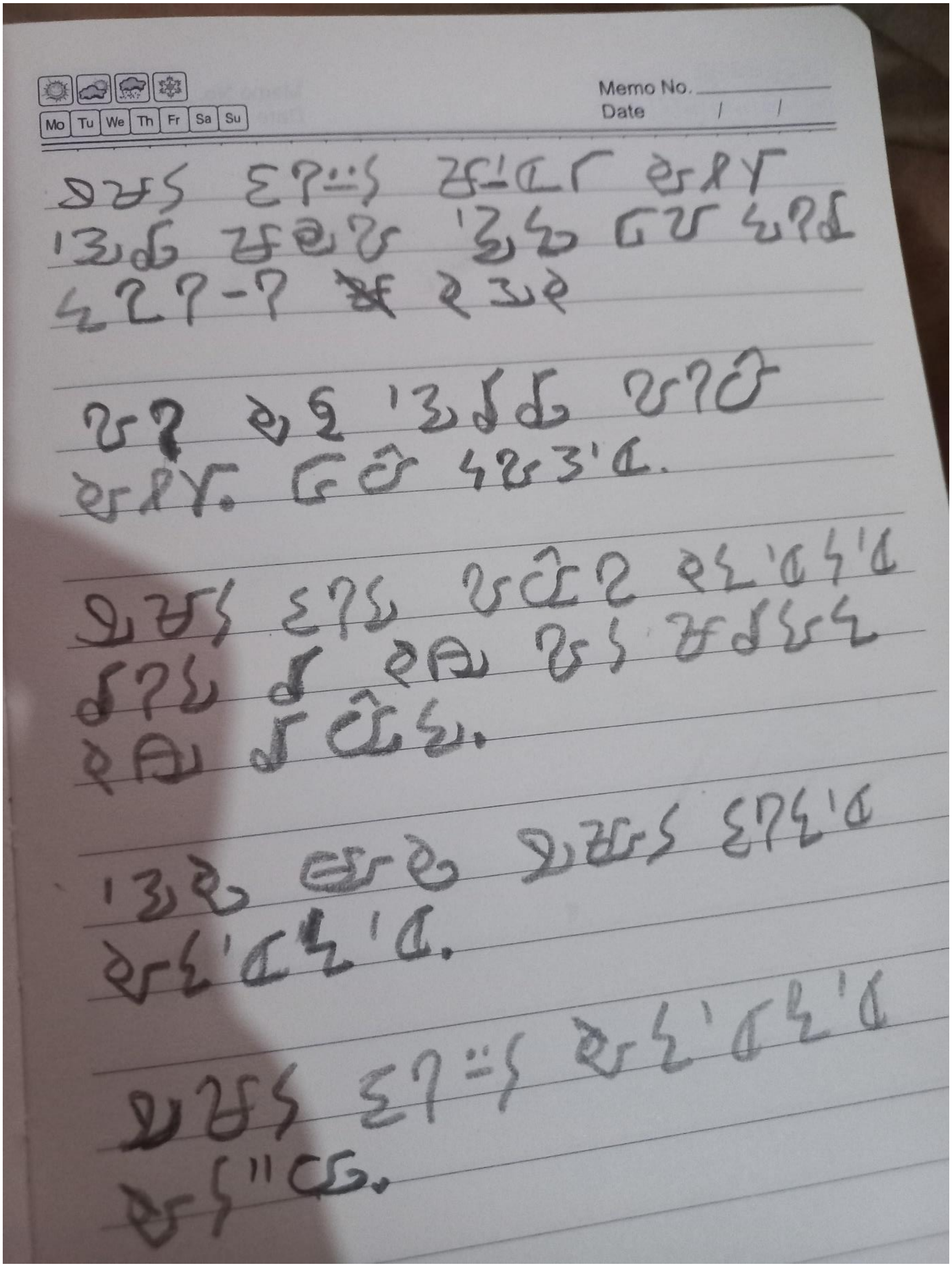

Memo No.
Date / /
Mo Tu We Th Fr Sa Su

Figure 8. Tumbuka-language journal entry from a Malawian user.

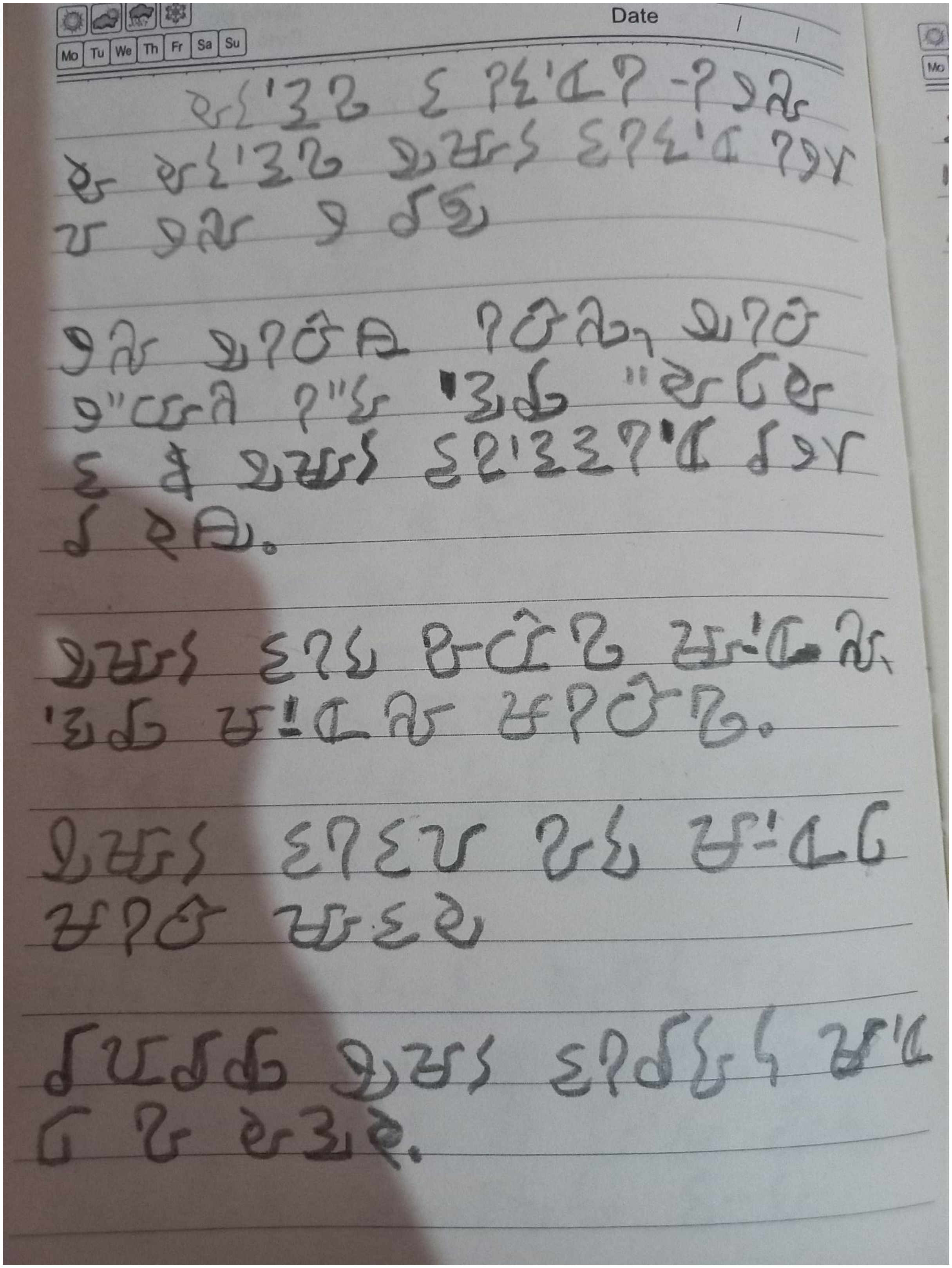


Figure 9. Tumbuka-language journal entry from a Malawian user.

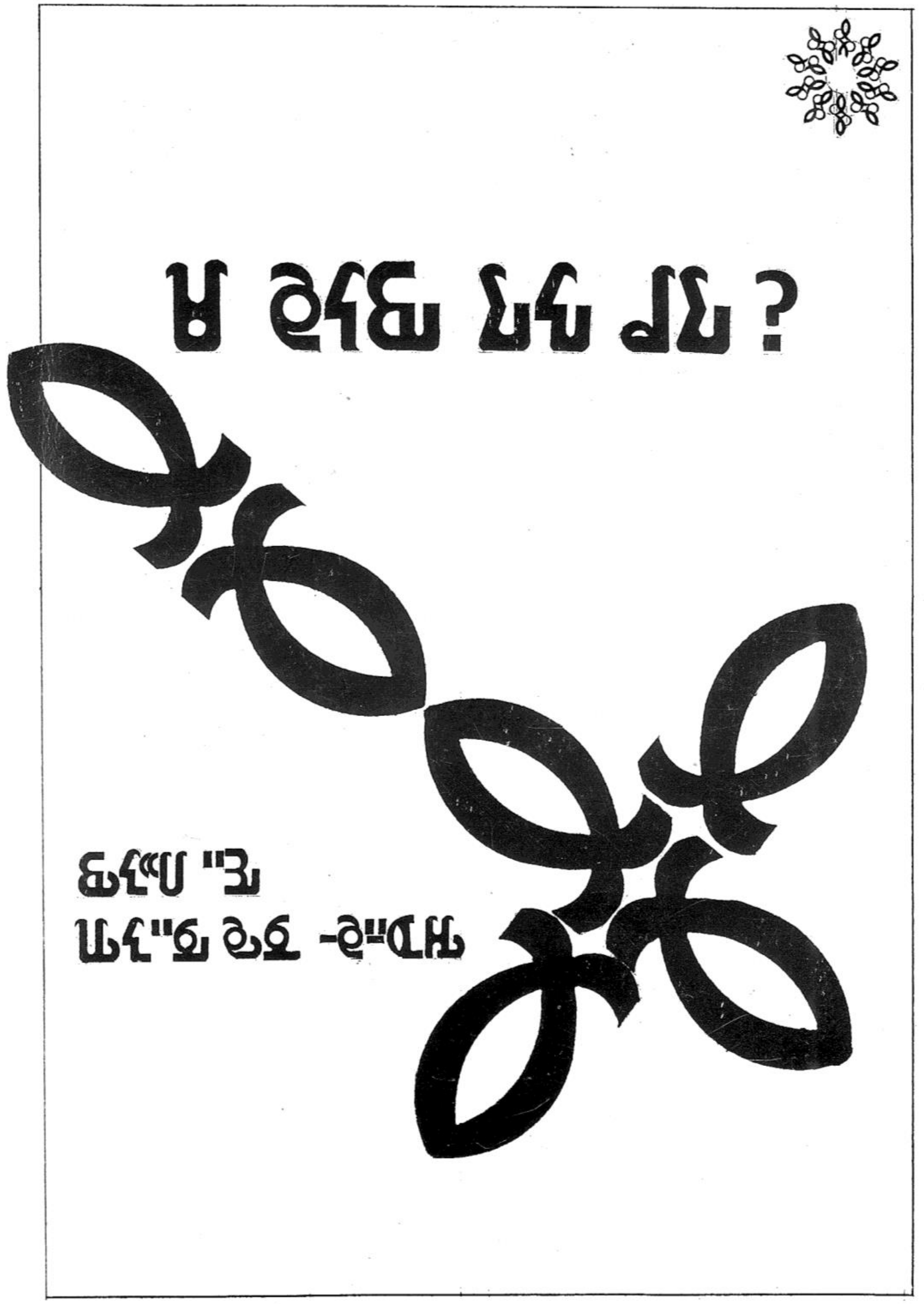


Figure 10. Cover page of the Chichewa language book “[illegible]?” (transliteration: “*A Malawi Tili Pati*”; translation: “*Malawians, where are we?*”)

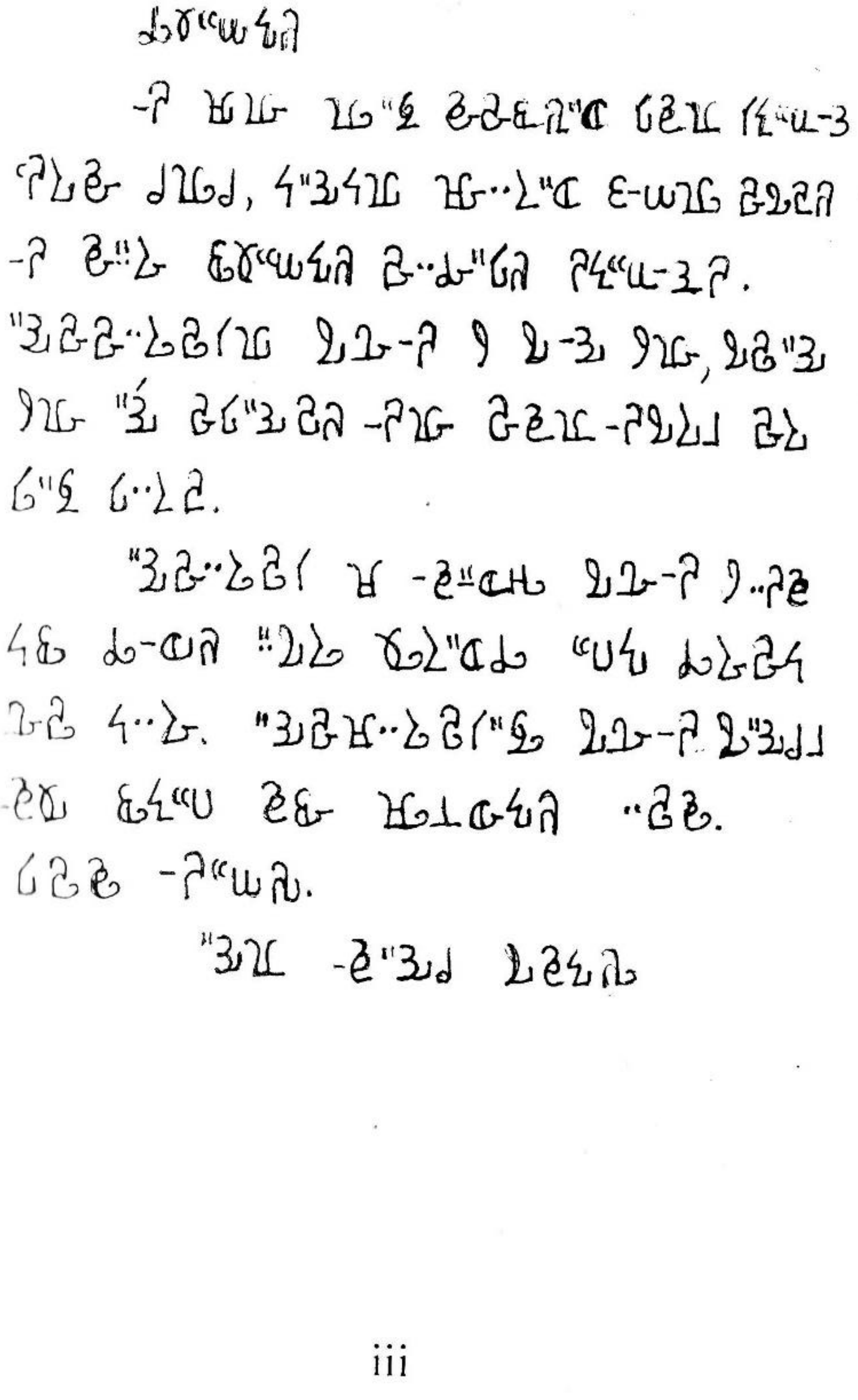
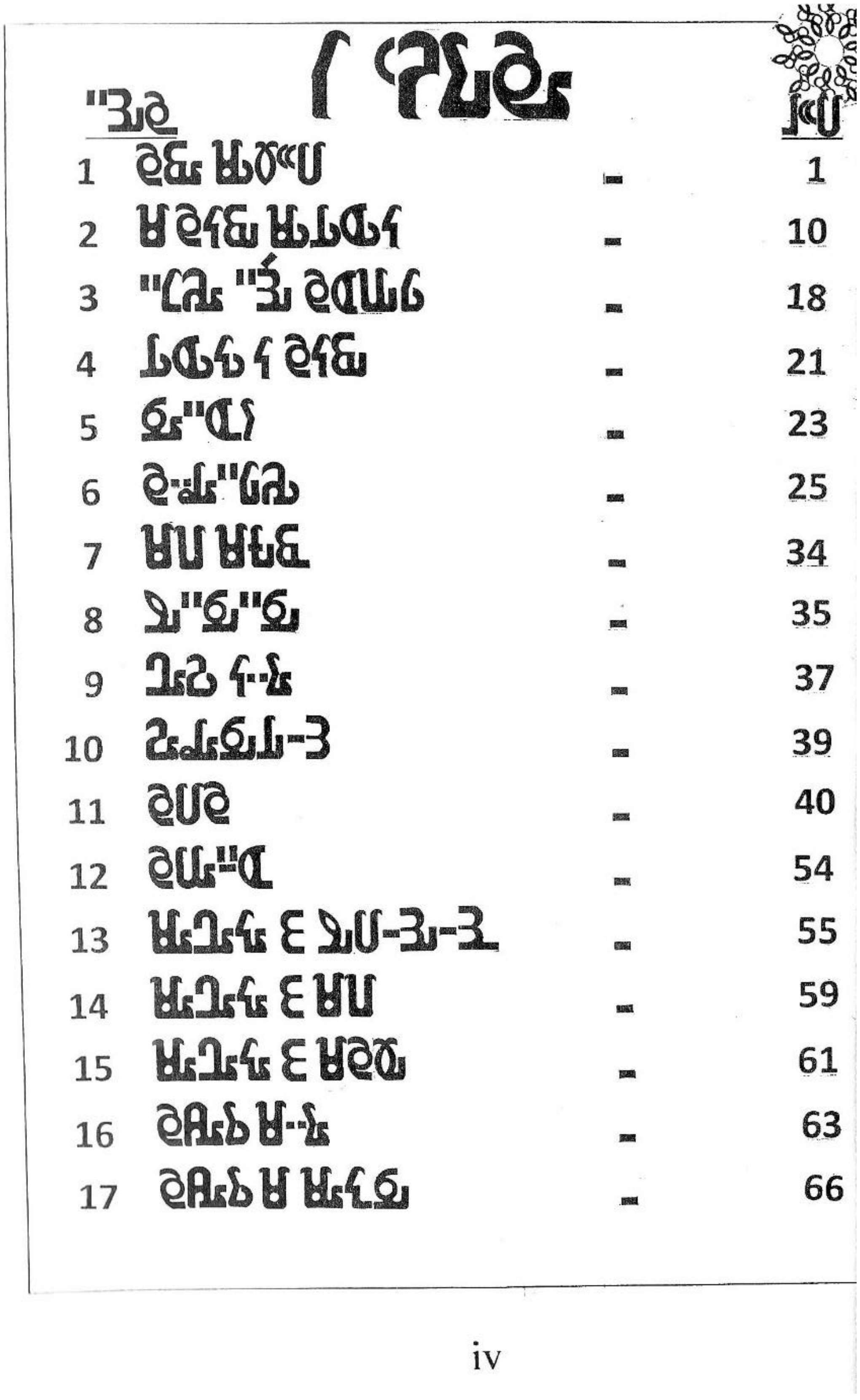


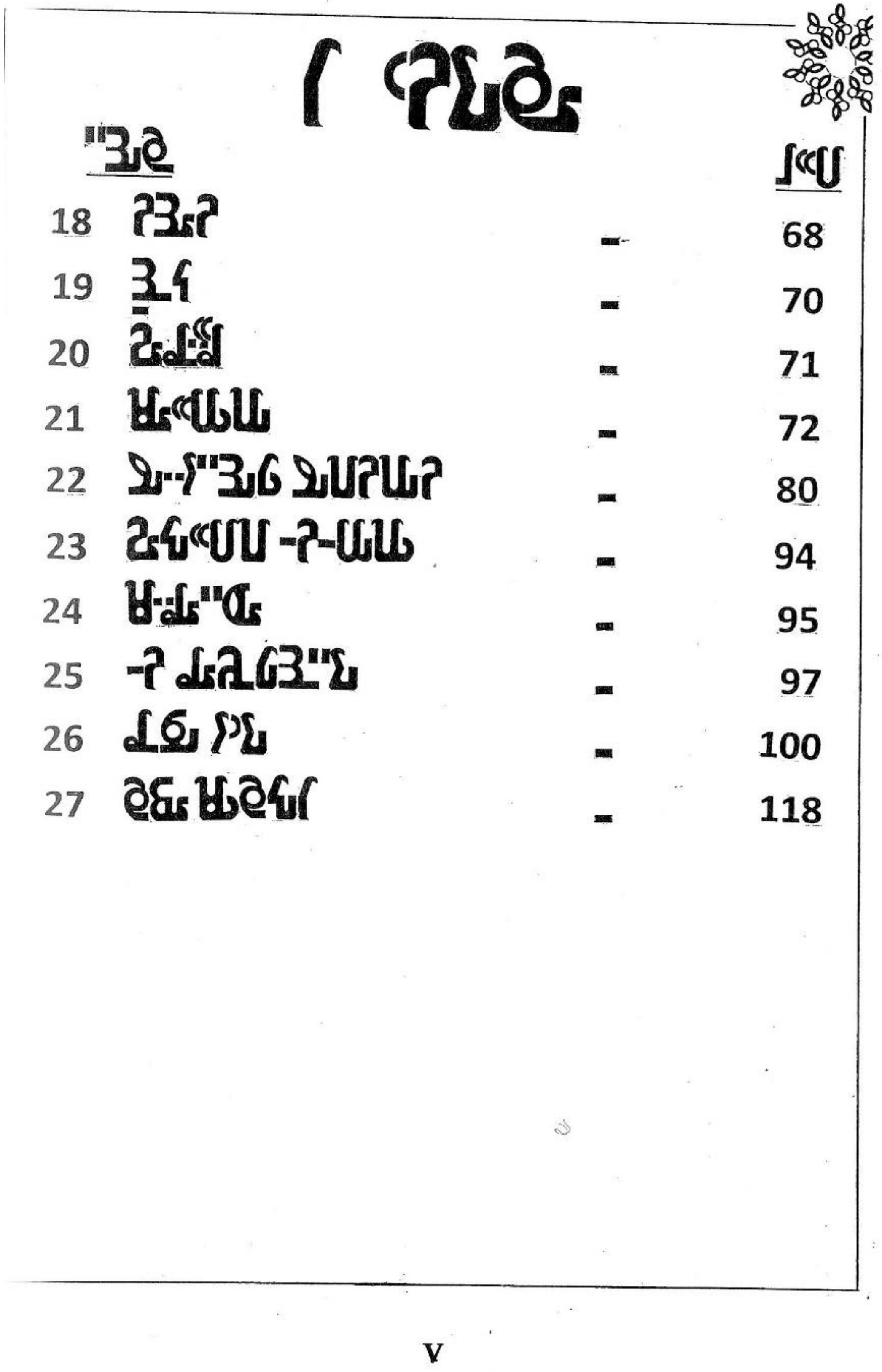
Figure 11. “[illegible]” page iii.



[illegible]		[illegible]
1	[illegible]	1
2	[illegible]	10
3	[illegible]	18
4	[illegible]	21
5	[illegible]	23
6	[illegible]	25
7	[illegible]	34
8	[illegible]	35
9	[illegible]	37
10	[illegible]	39
11	[illegible]	40
12	[illegible]	54
13	[illegible]	55
14	[illegible]	59
15	[illegible]	61
16	[illegible]	63
17	[illegible]	66

iv

Figure 12. Table of contents of “[illegible]?”, page iv.



[illegible]

[illegible]		[illegible]
18	[illegible]	68
19	[illegible]	70
20	[illegible]	71
21	[illegible]	72
22	[illegible]	80
23	[illegible]	94
24	[illegible]	95
25	[illegible]	97
26	[illegible]	100
27	[illegible]	118

Figure 13. Table of contents of “[illegible]?”, page v.

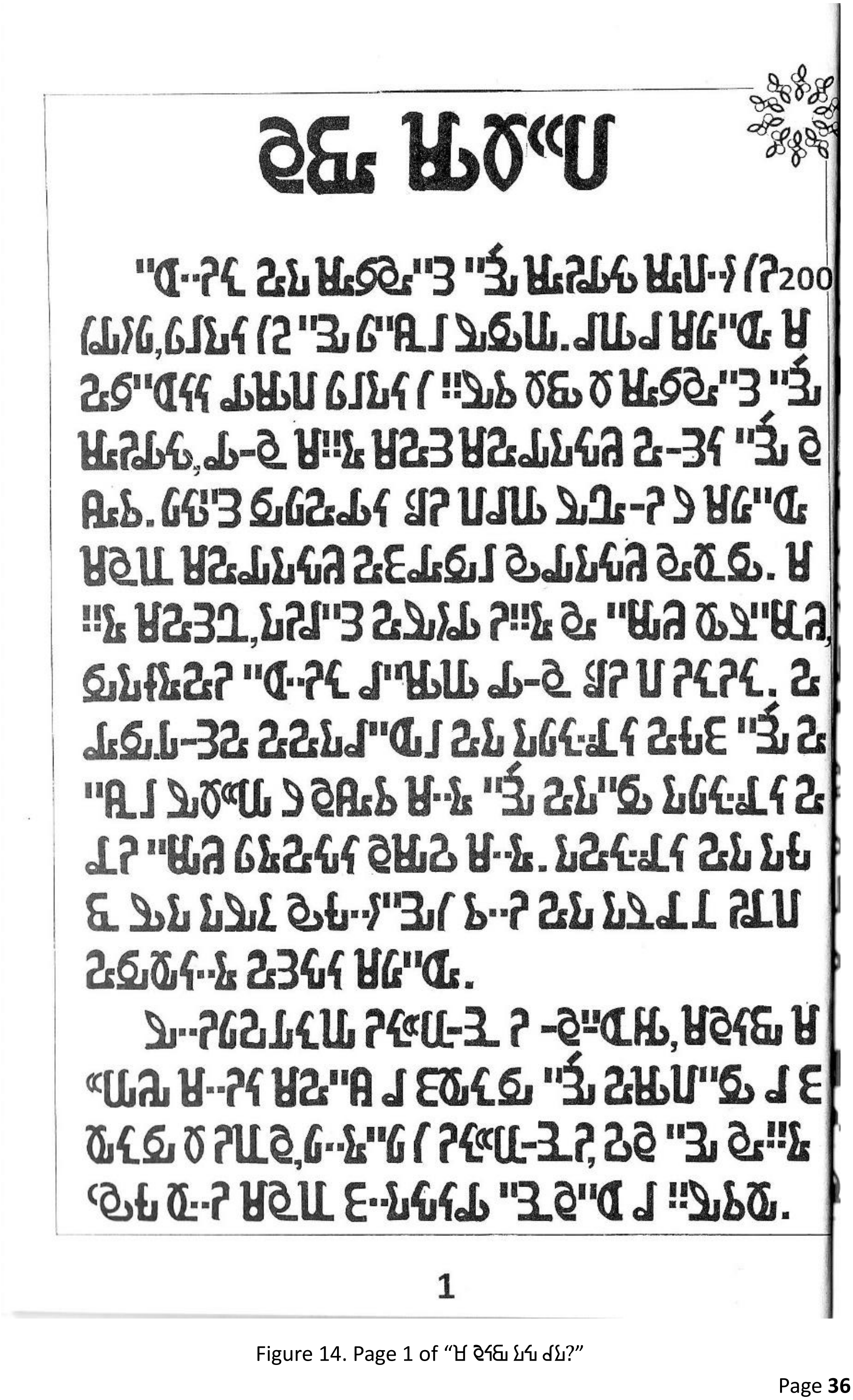


Figure 14. Page 1 of “[illegible]”

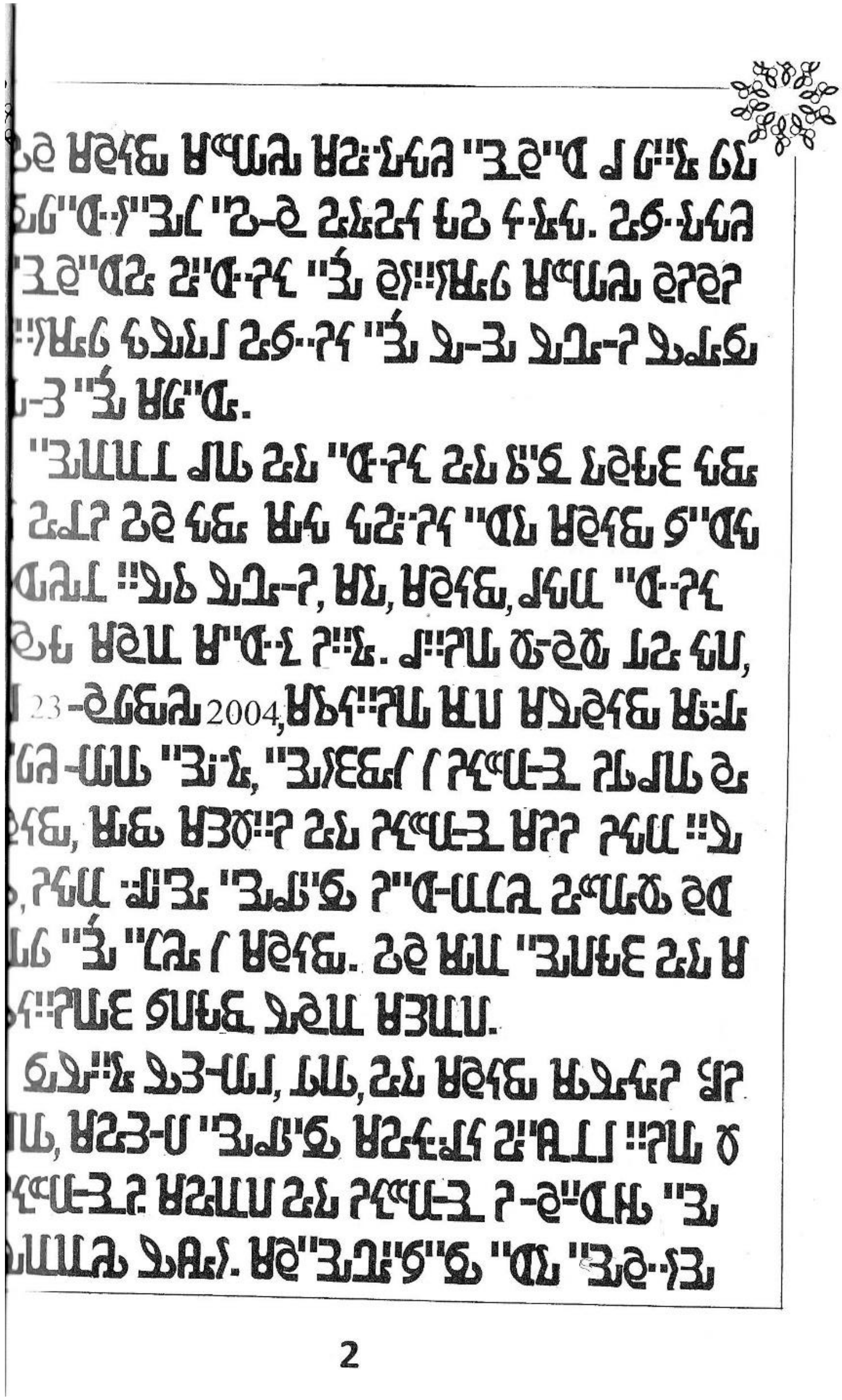


Figure 15. Page 2 of “[illegible]?”

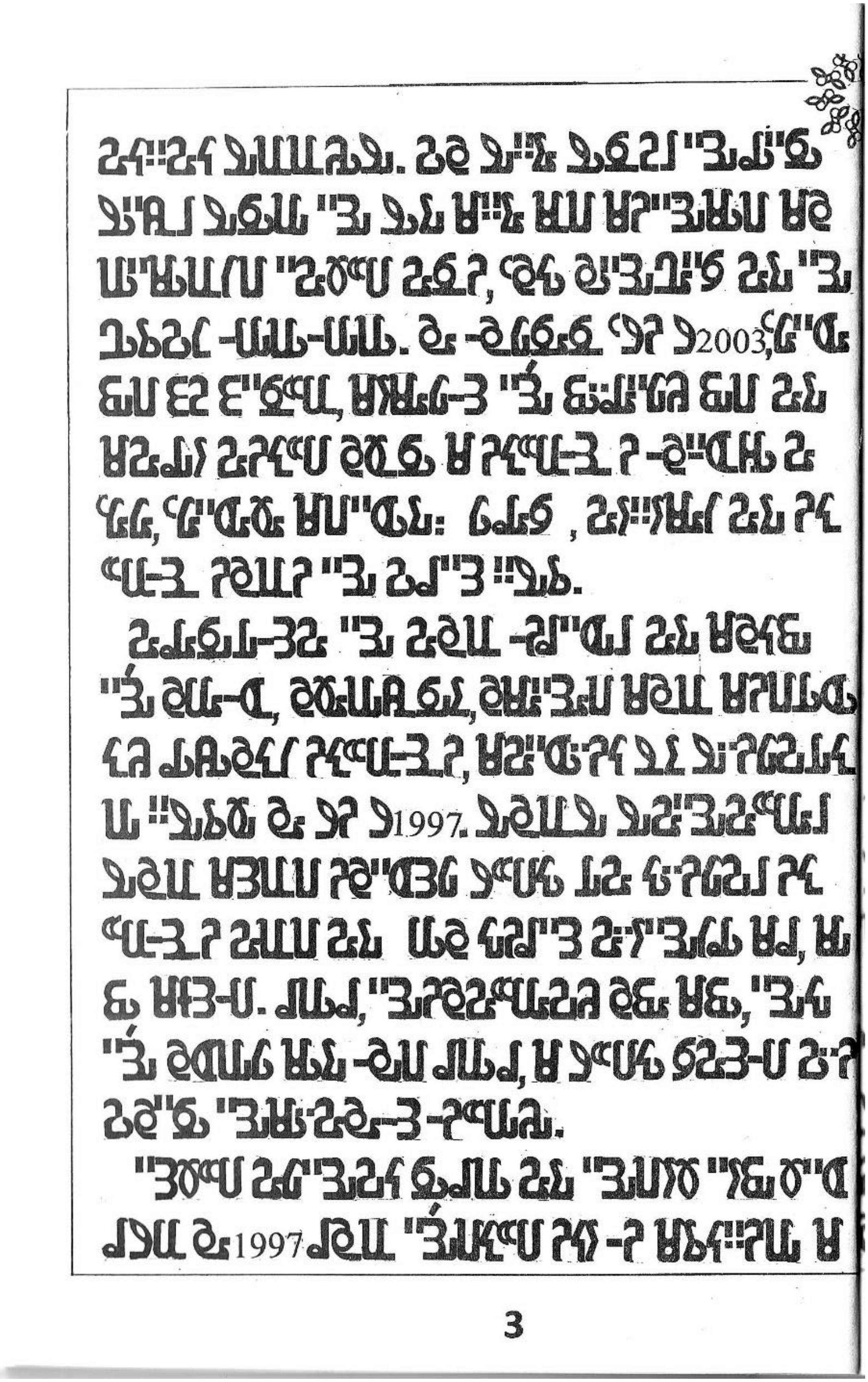


Figure 16. Page 3 of “[illegible]?”

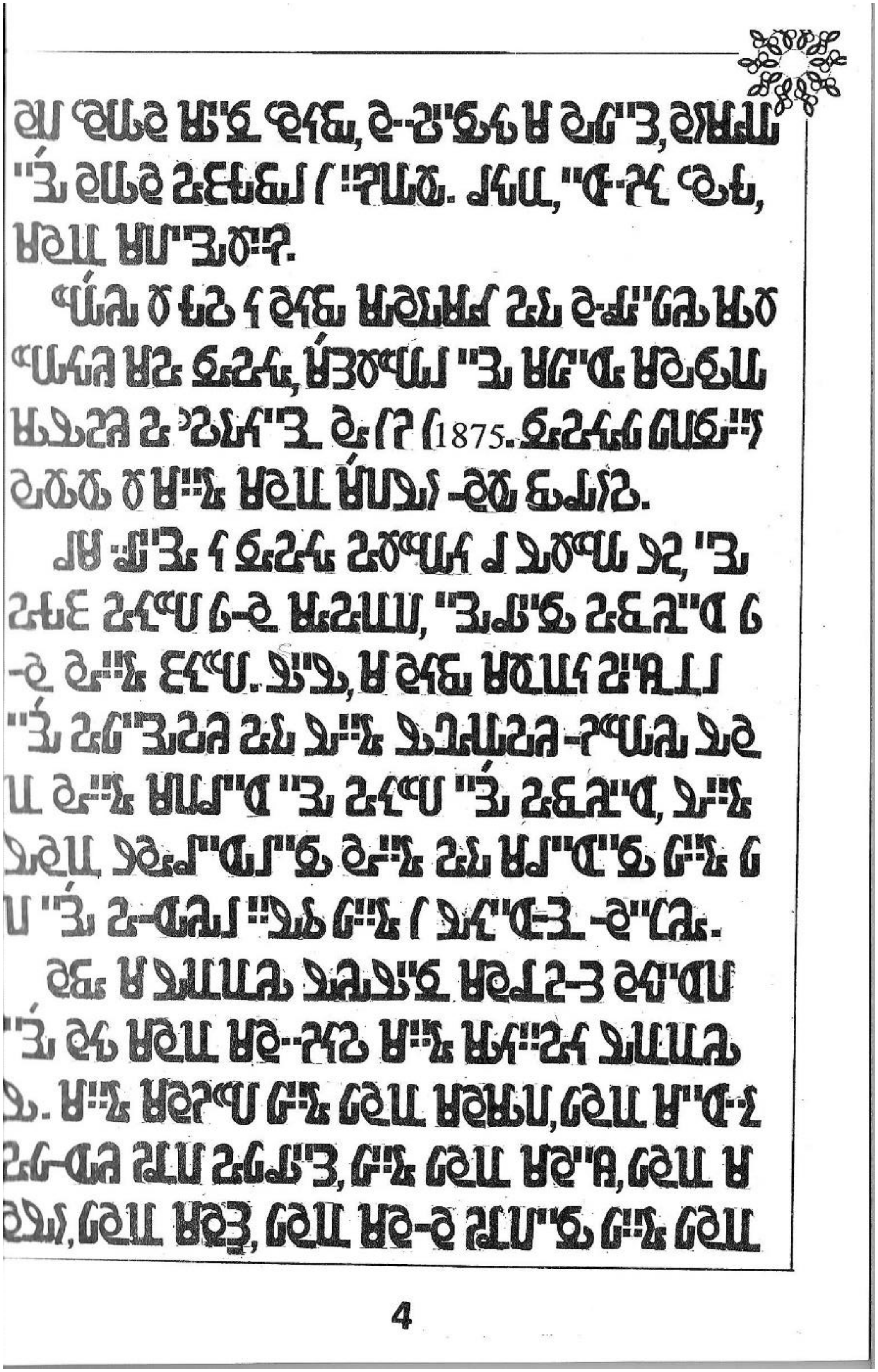


Figure 17. Page 4 of “[illegible]”

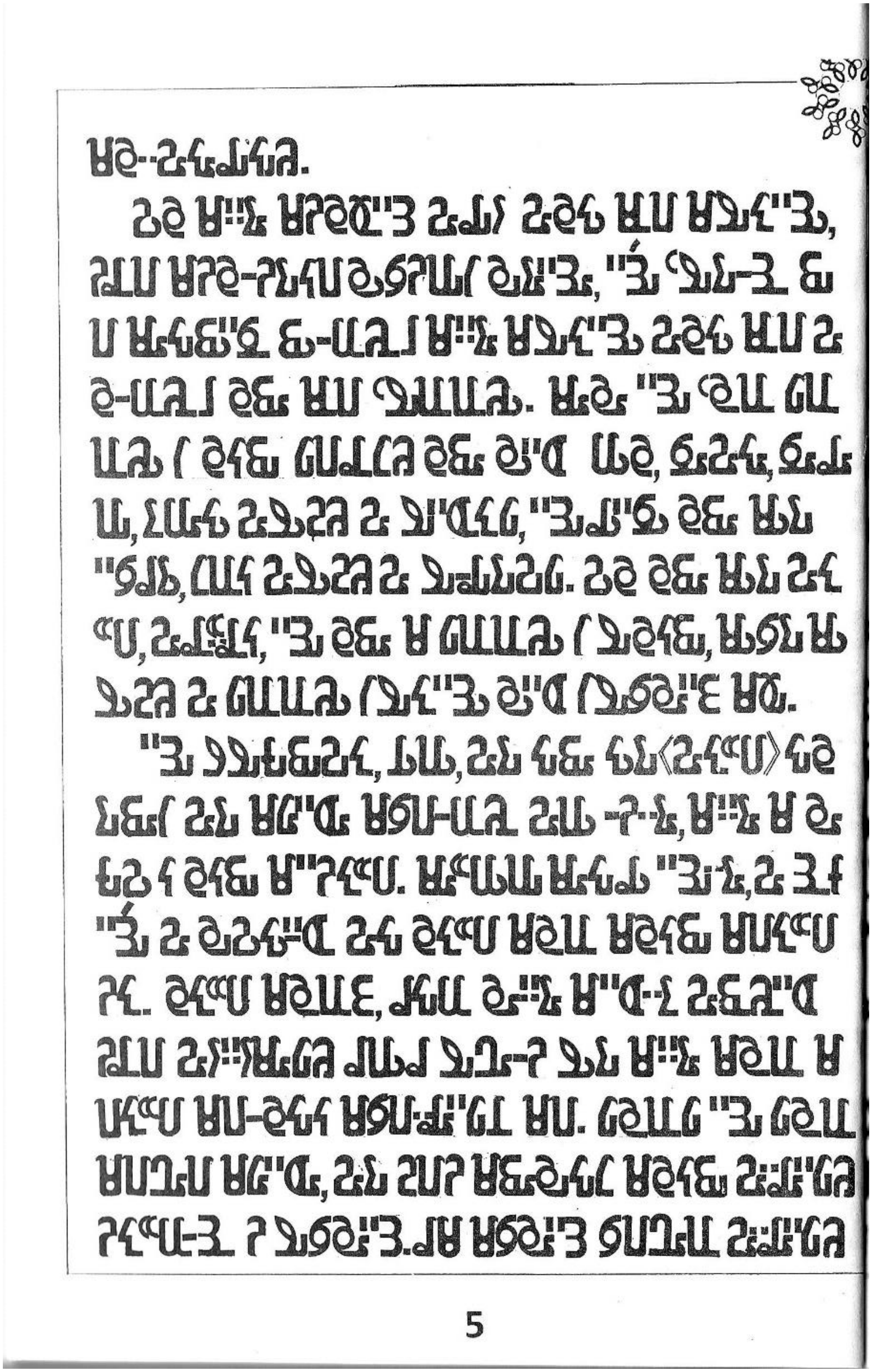


Figure 18. Page 5 of “[illegible]”

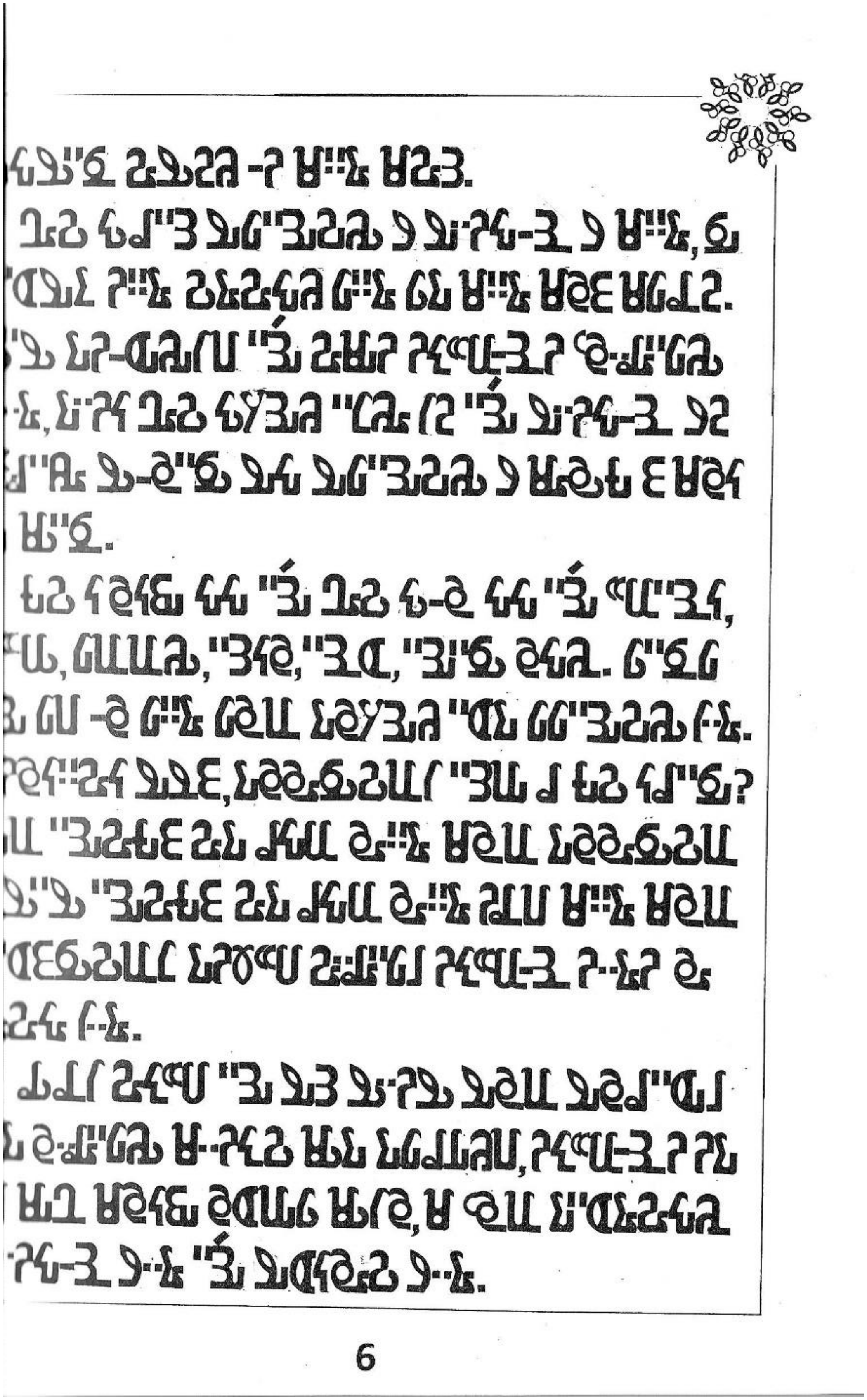


Figure 19. Page 6 of “[illegible]”

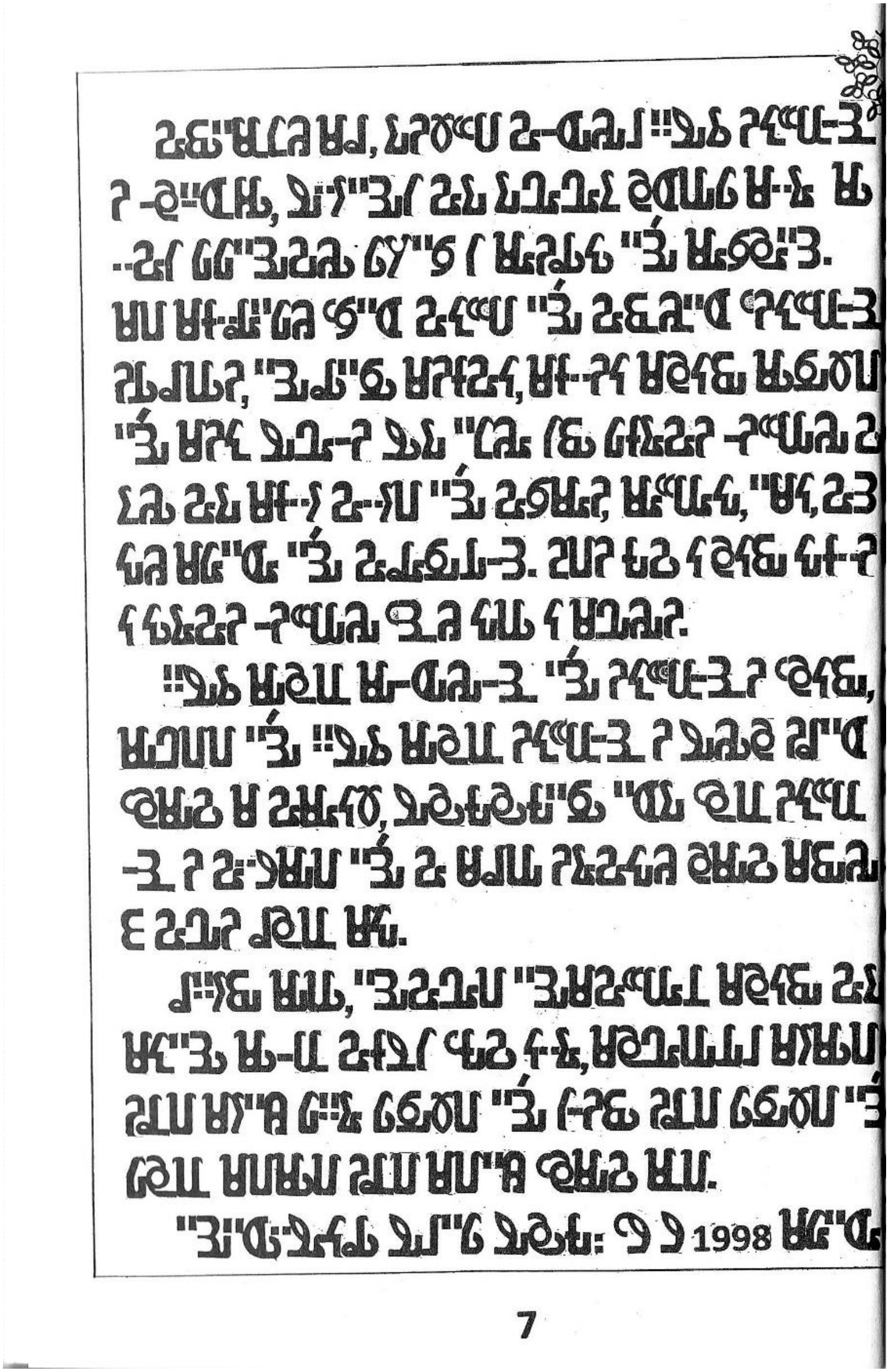


Figure 20. Page 7 of “[illegible]?”

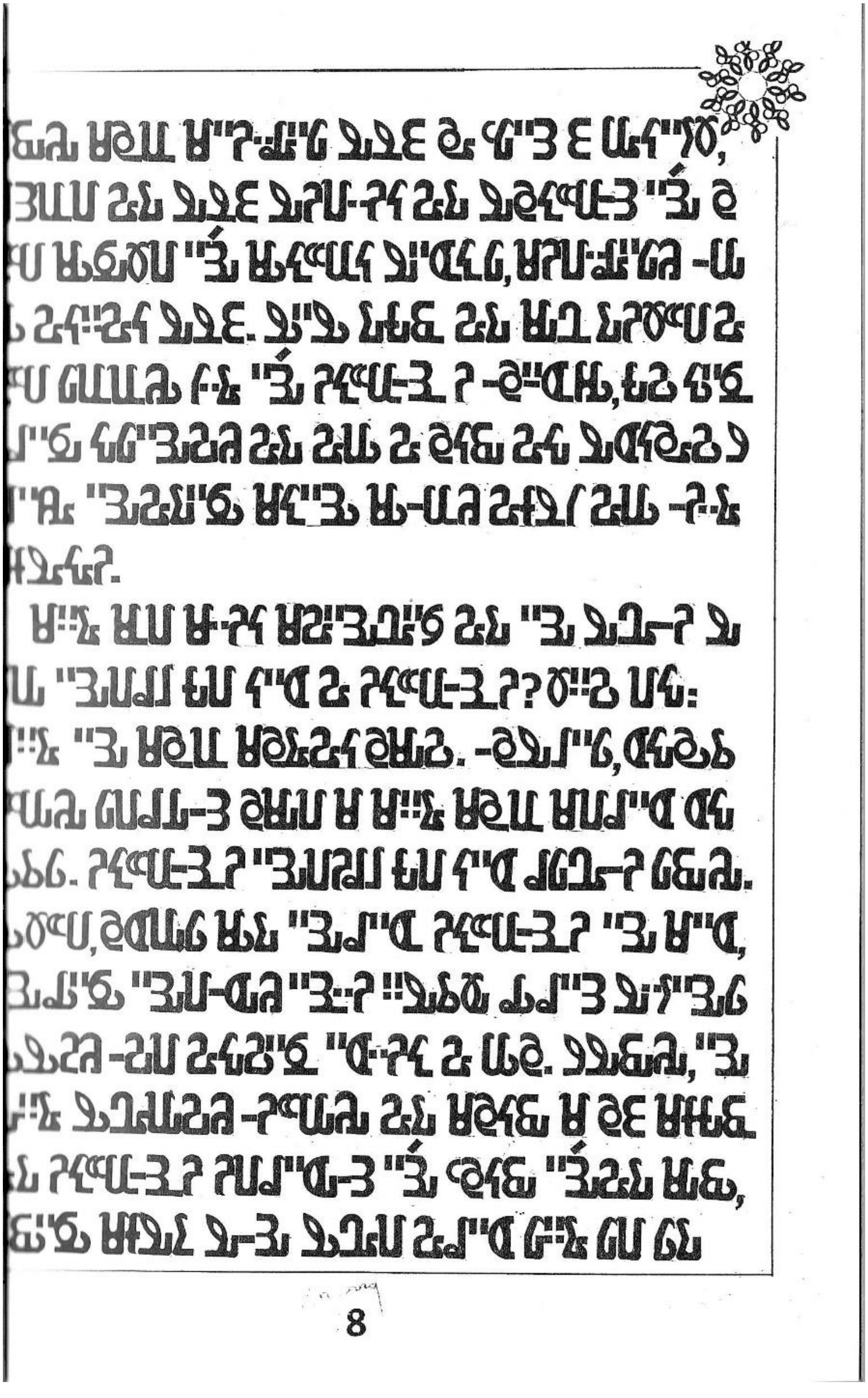


Figure 21. Page 8 of “[illegible]”

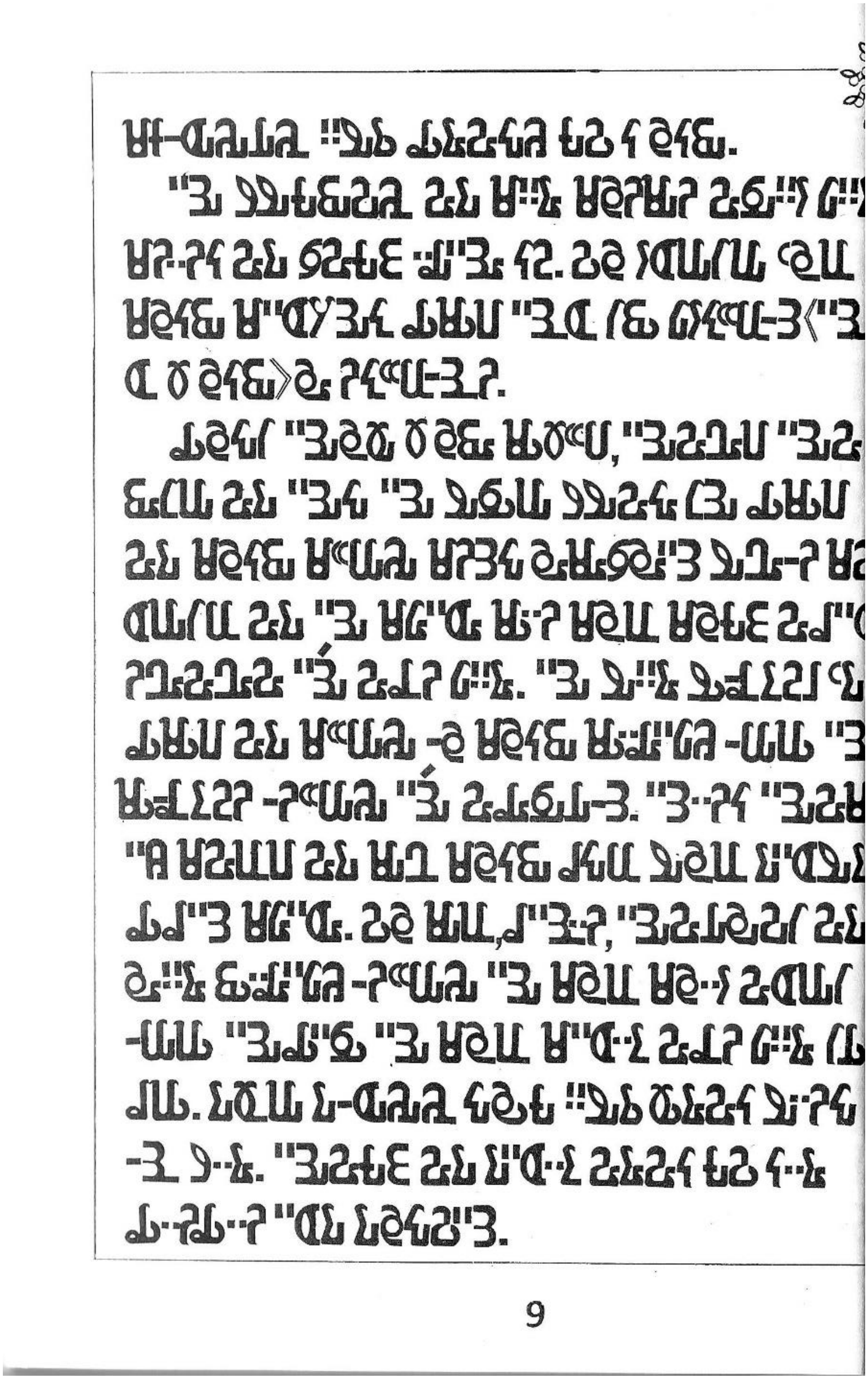


Figure 22. Page 9 of “[illegible]?”

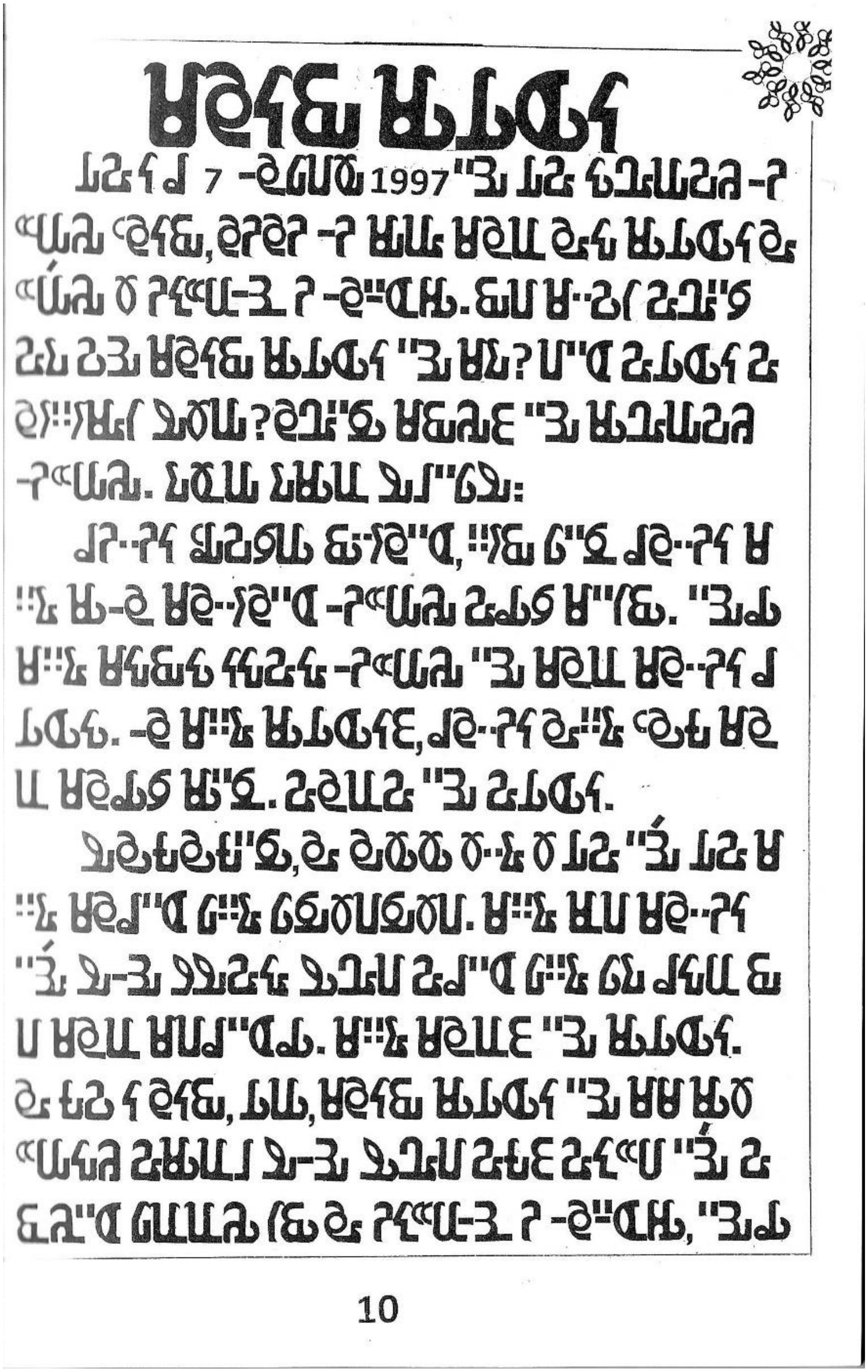


Figure 23. Page 10 of “[illegible]”

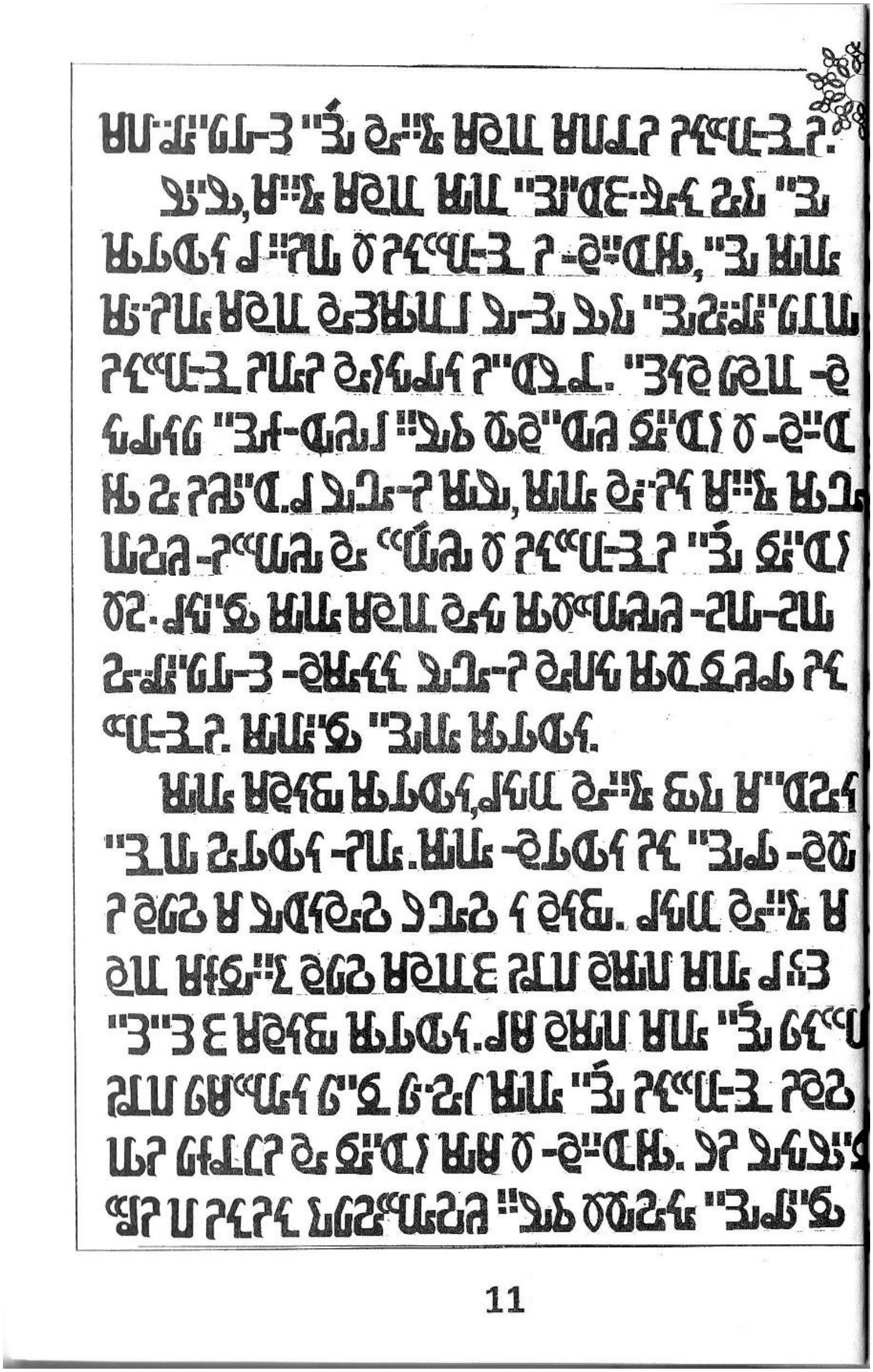


Figure 24. Page 11 of “[illegible]”

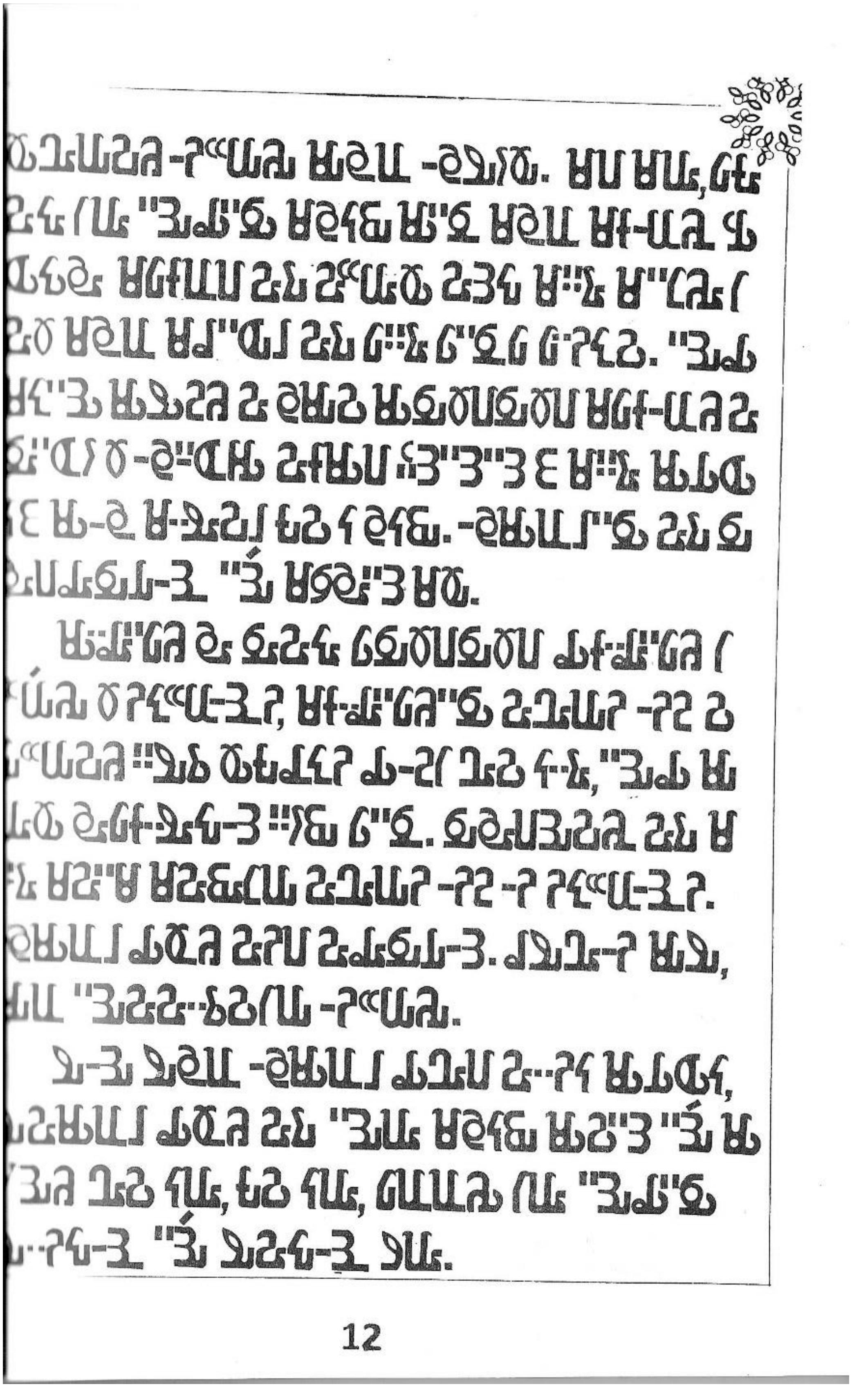


Figure 25. Page 12 of “[illegible]?”

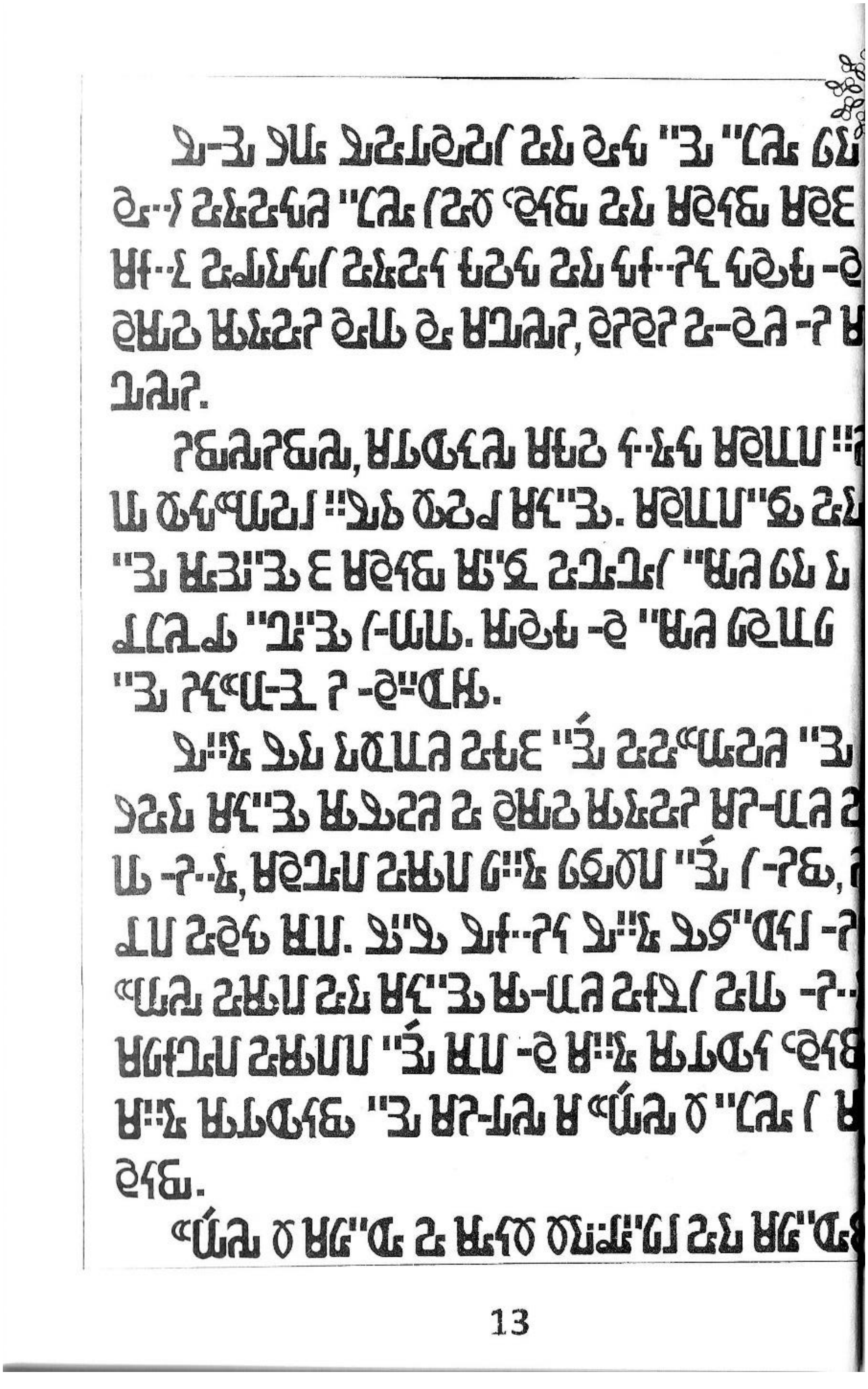


Figure 26. Page 13 of “[illegible]”

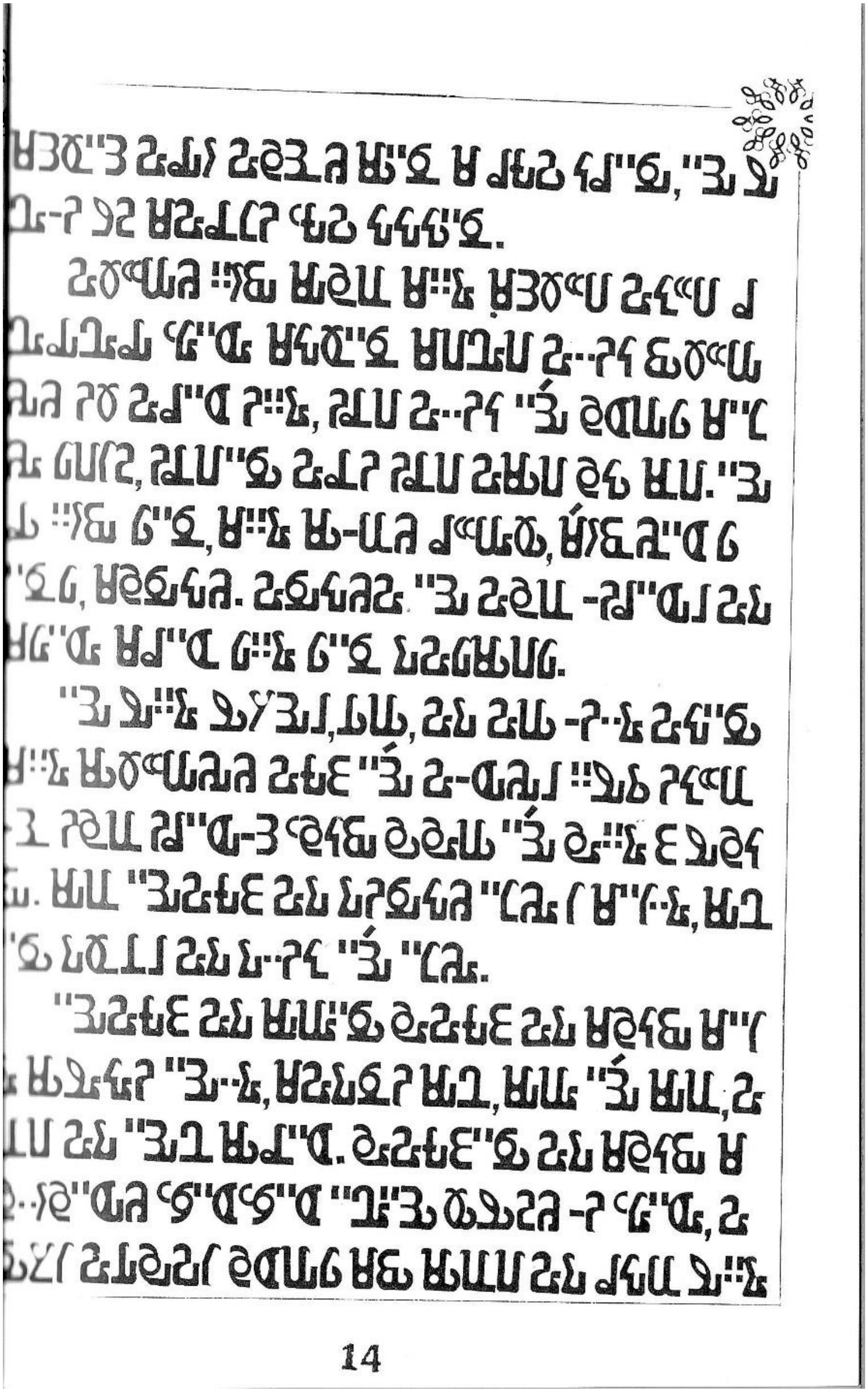


Figure 27. Page 14 of “[illegible]”

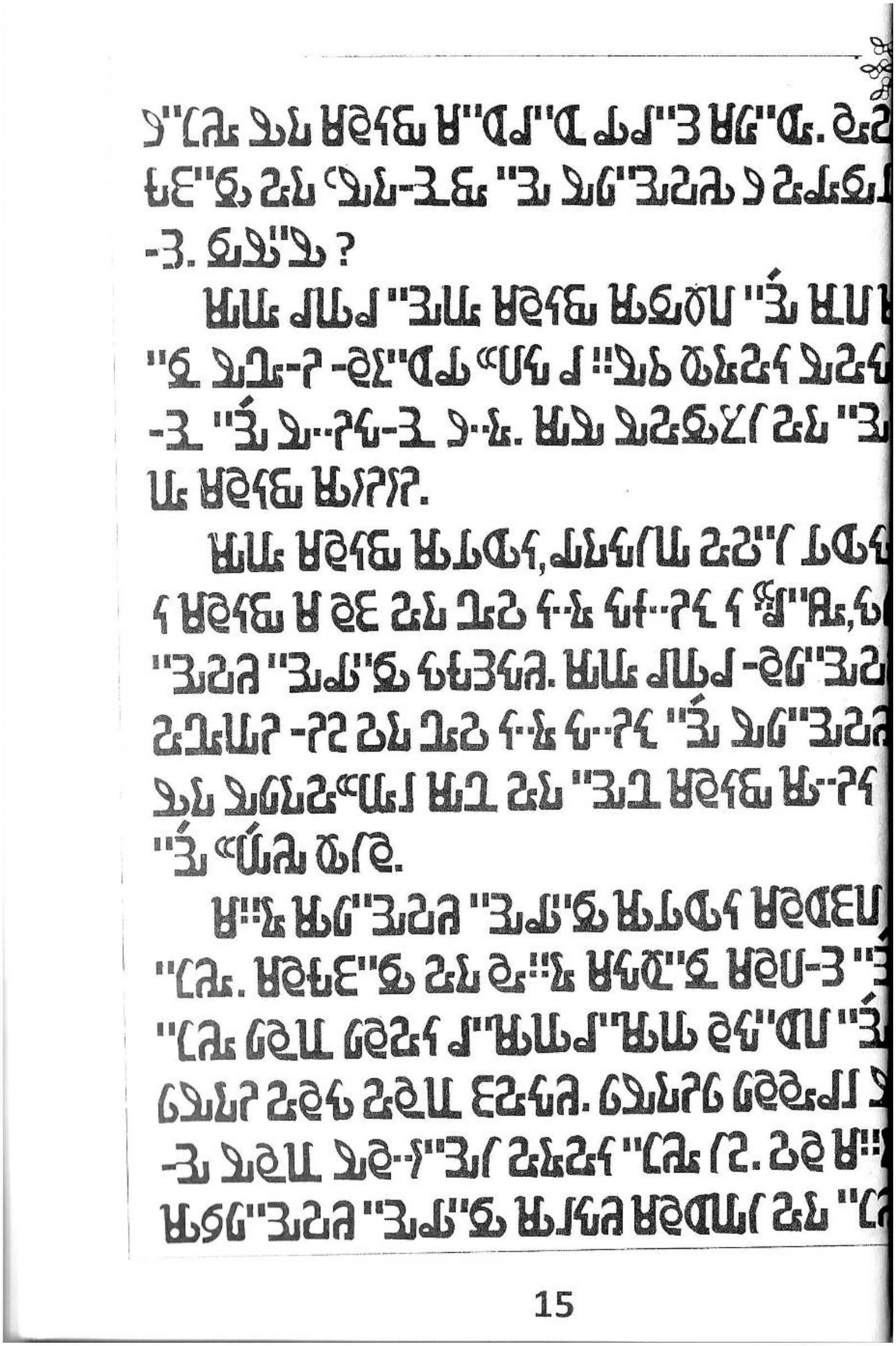


Figure 28. Page 15 of “[illegible]?”

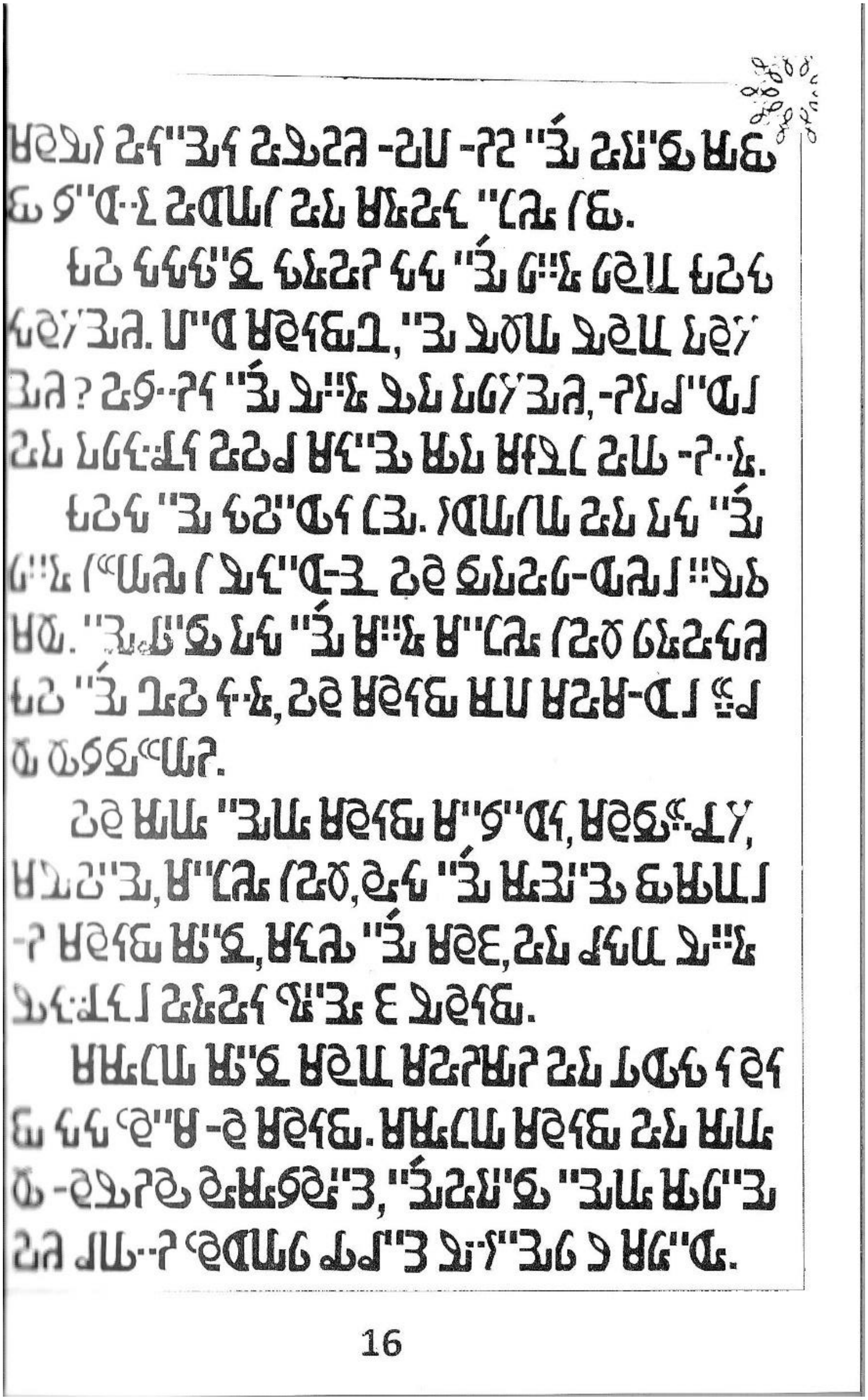


Figure 29. Page 16 of “[illegible]?”

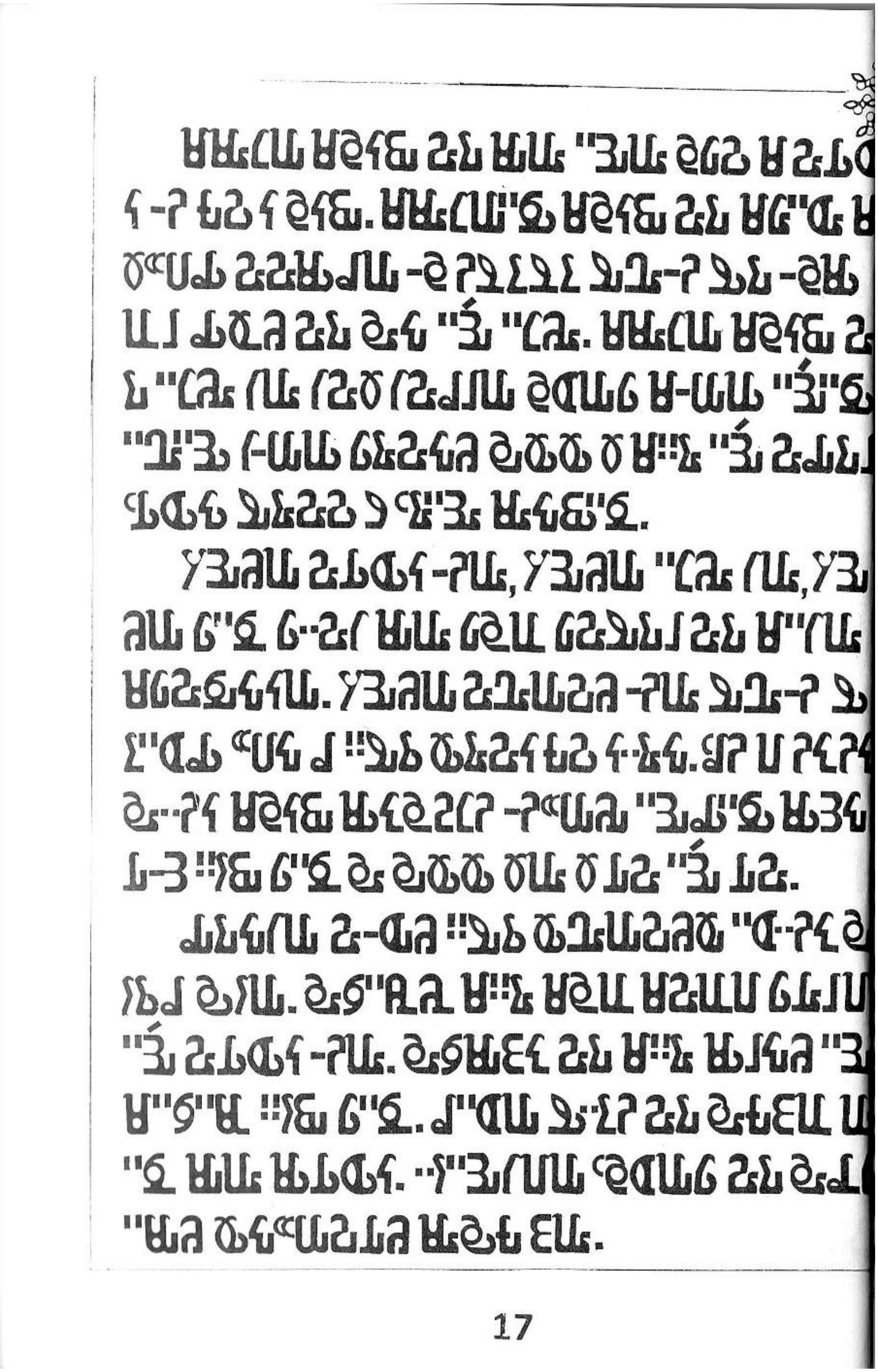


Figure 30. Page 17 of “[illegible]”

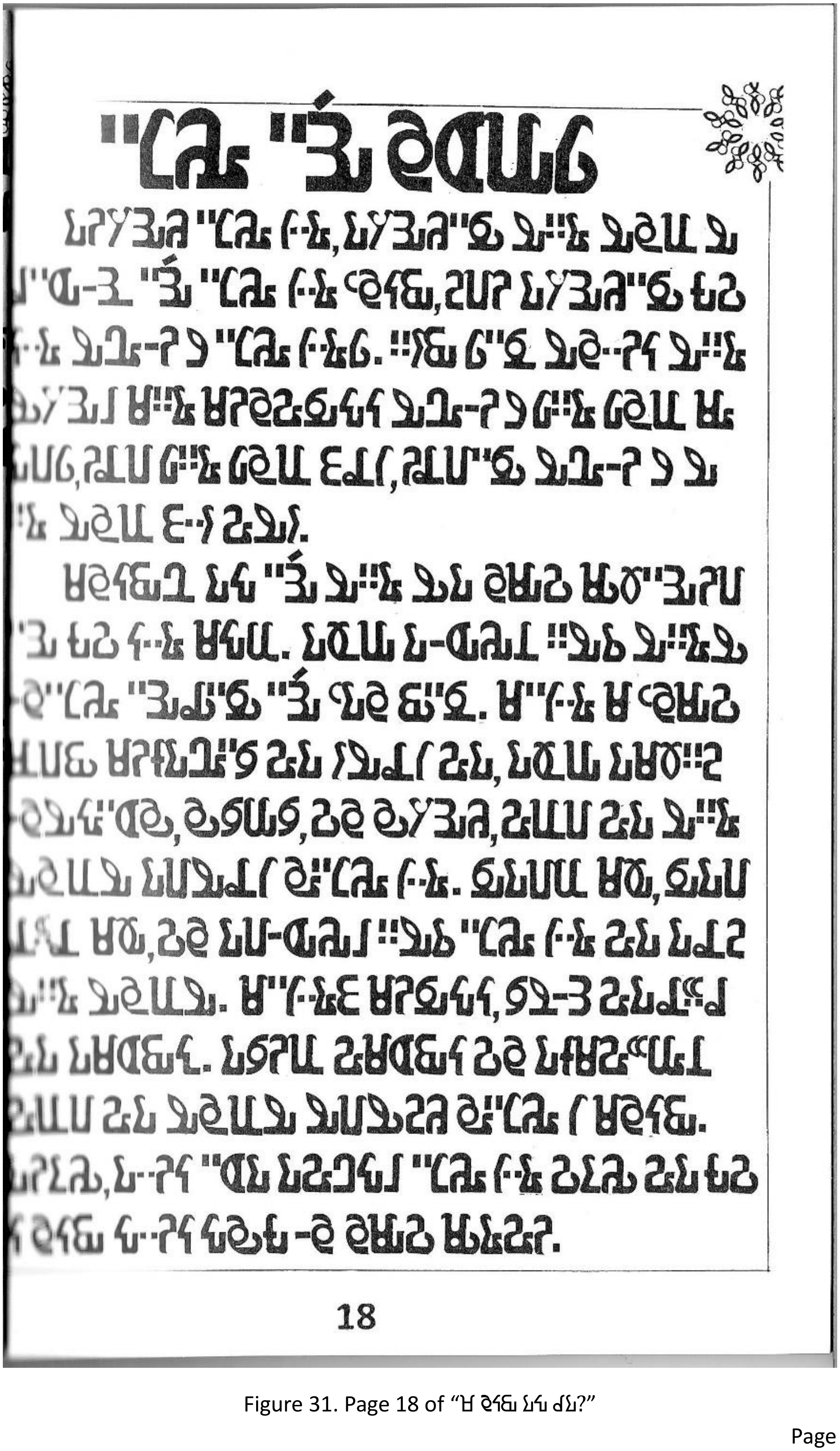
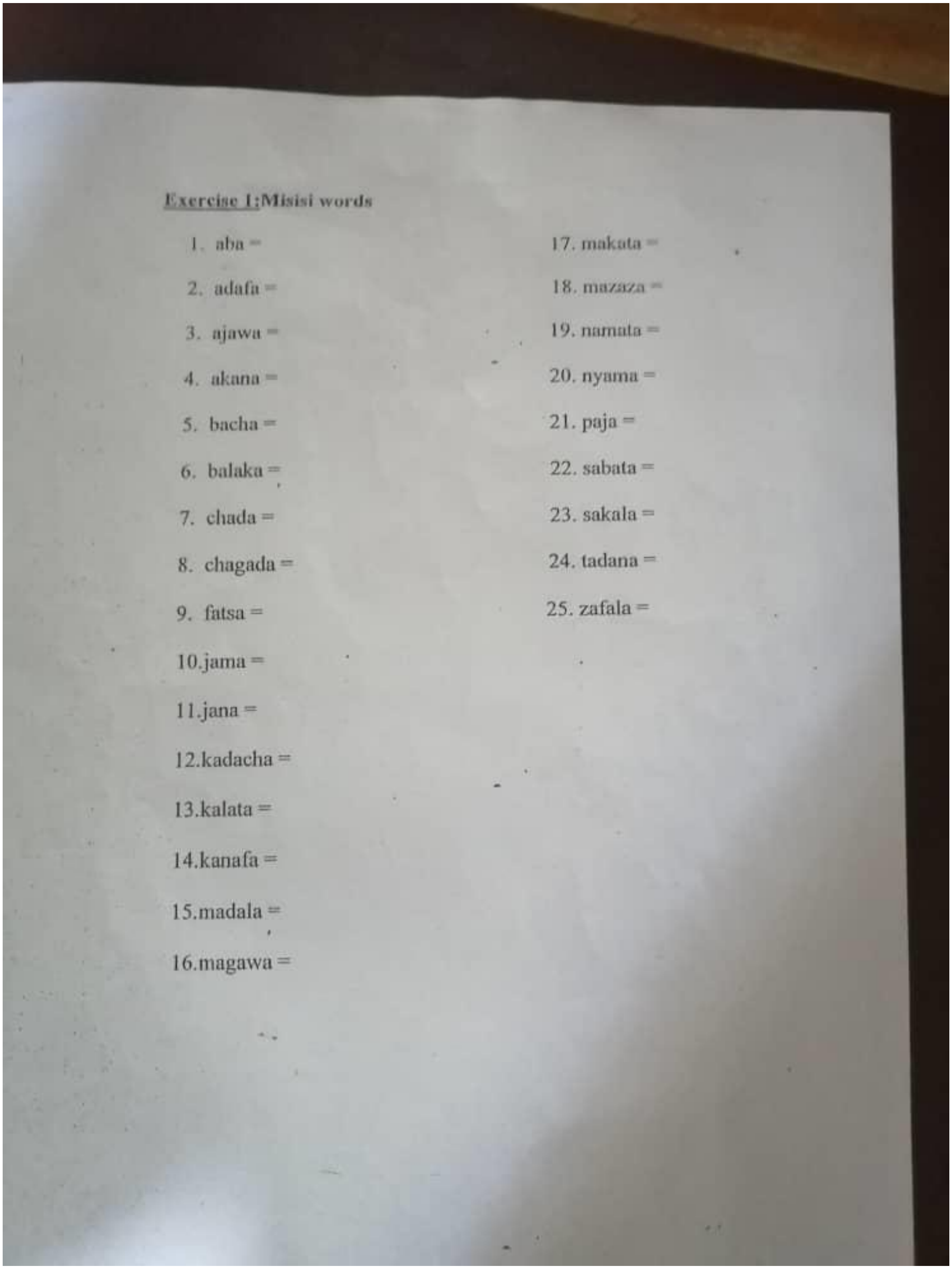


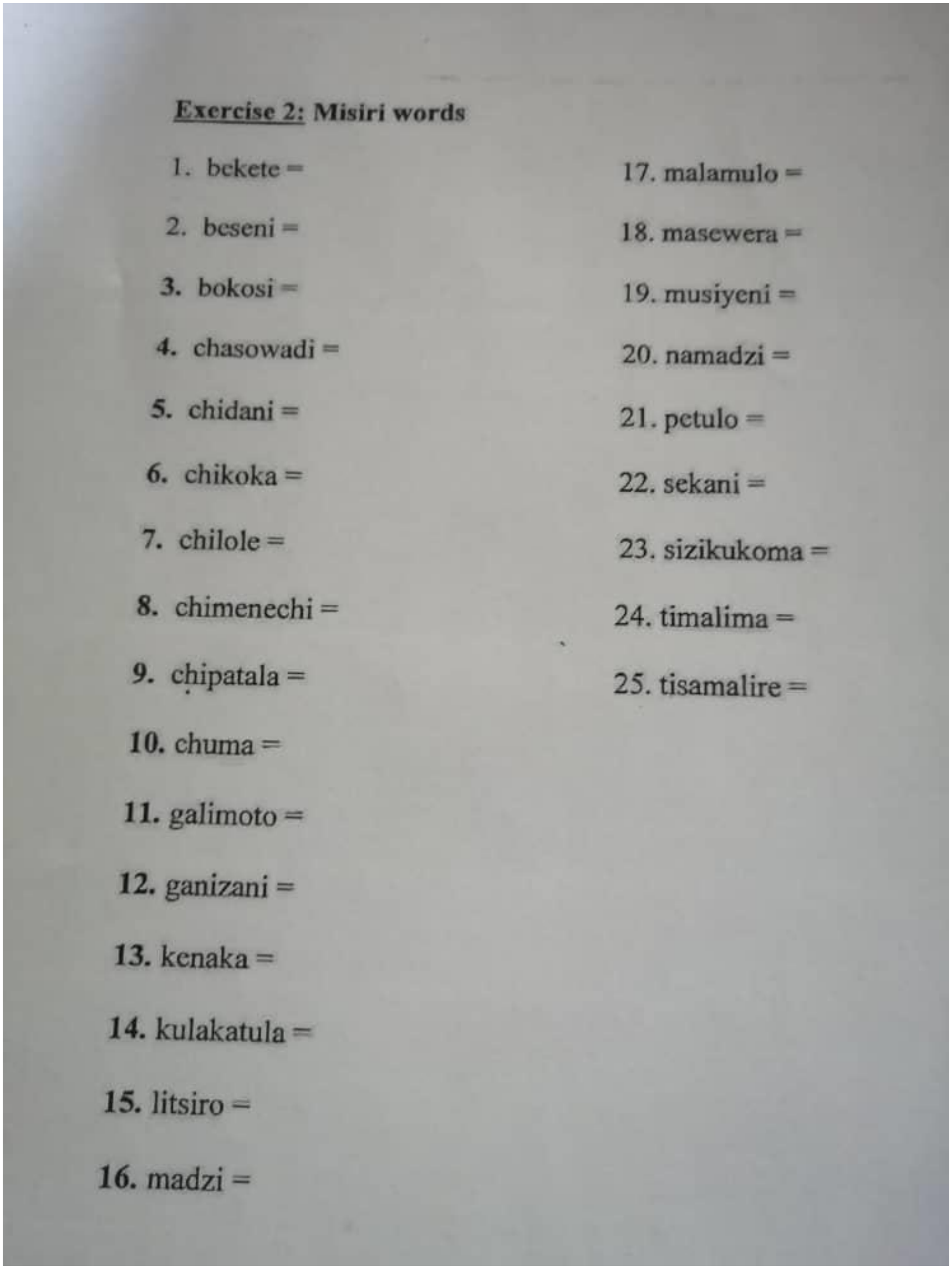
Figure 31. Page 18 of “[illegible]?”



Exercise 1:Misisi words

1. aba =
2. adafa =
3. ajawa =
4. akana =
5. bacha =
6. balaka =
7. chada =
8. chagada =
9. fatsa =
10. jama =
11. jana =
12. kadacha =
13. kalata =
14. kanafa =
15. madala =
16. magawa =
17. makata =
18. mazaza =
19. namata =
20. nyama =
21. paja =
22. sabata =
23. sakala =
24. tadana =
25. zafala =

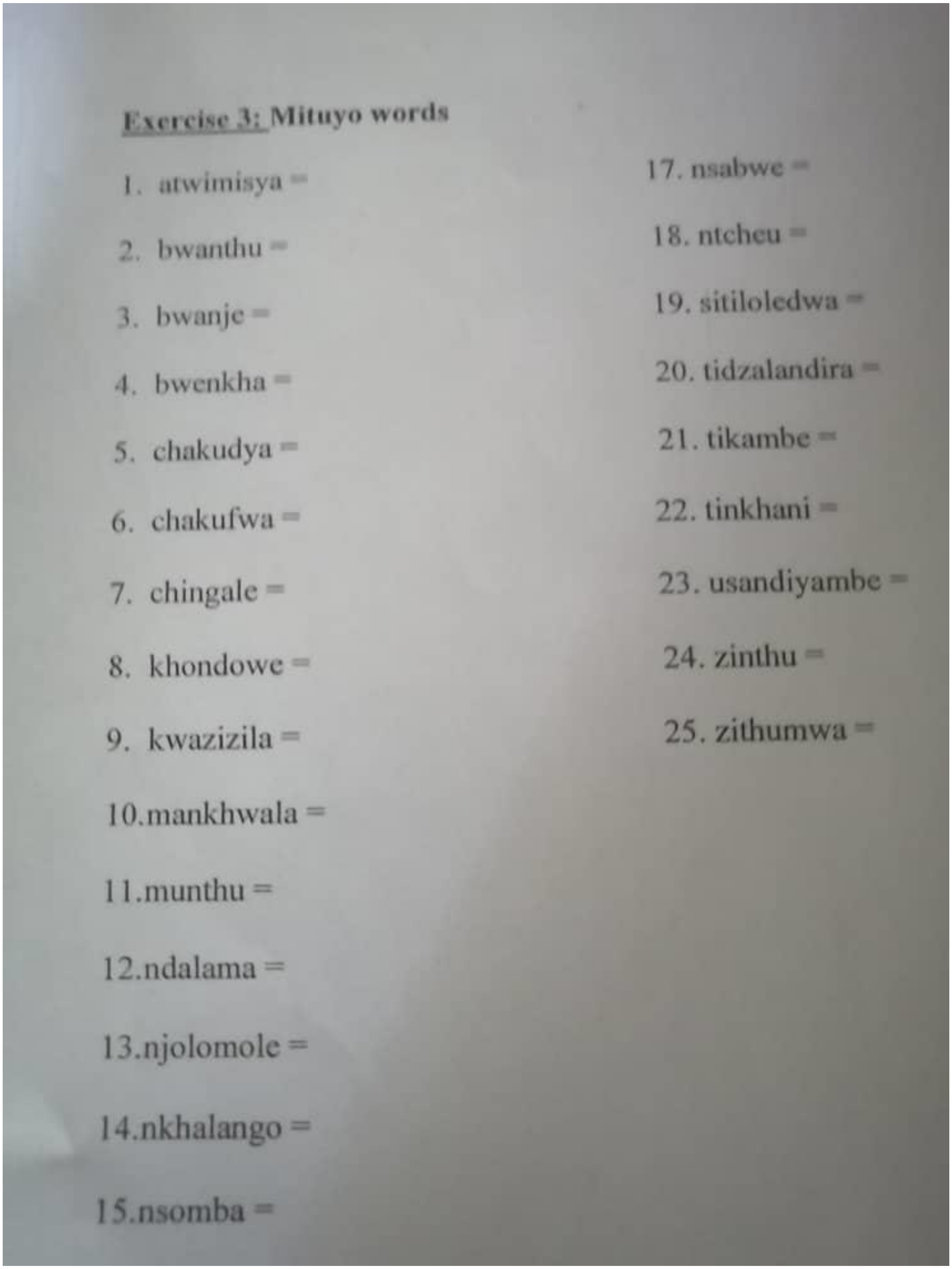
Figure 32. Exercise material of Misisi words for students to transliterate into the Mwangwego script.



Exercise 2: Misiri words

1. bekete =
2. beseni =
3. bokosi =
4. chasowadi =
5. chidani =
6. chikoka =
7. chilole =
8. chimenechi =
9. chipatala =
10. chuma =
11. galimoto =
12. ganizani =
13. kenaka =
14. kulakatula =
15. litsiro =
16. madzi =
17. malamulo =
18. masewera =
19. musiyeni =
20. namadzi =
21. petulo =
22. sekani =
23. sizikukoma =
24. timalima =
25. tisamalire =

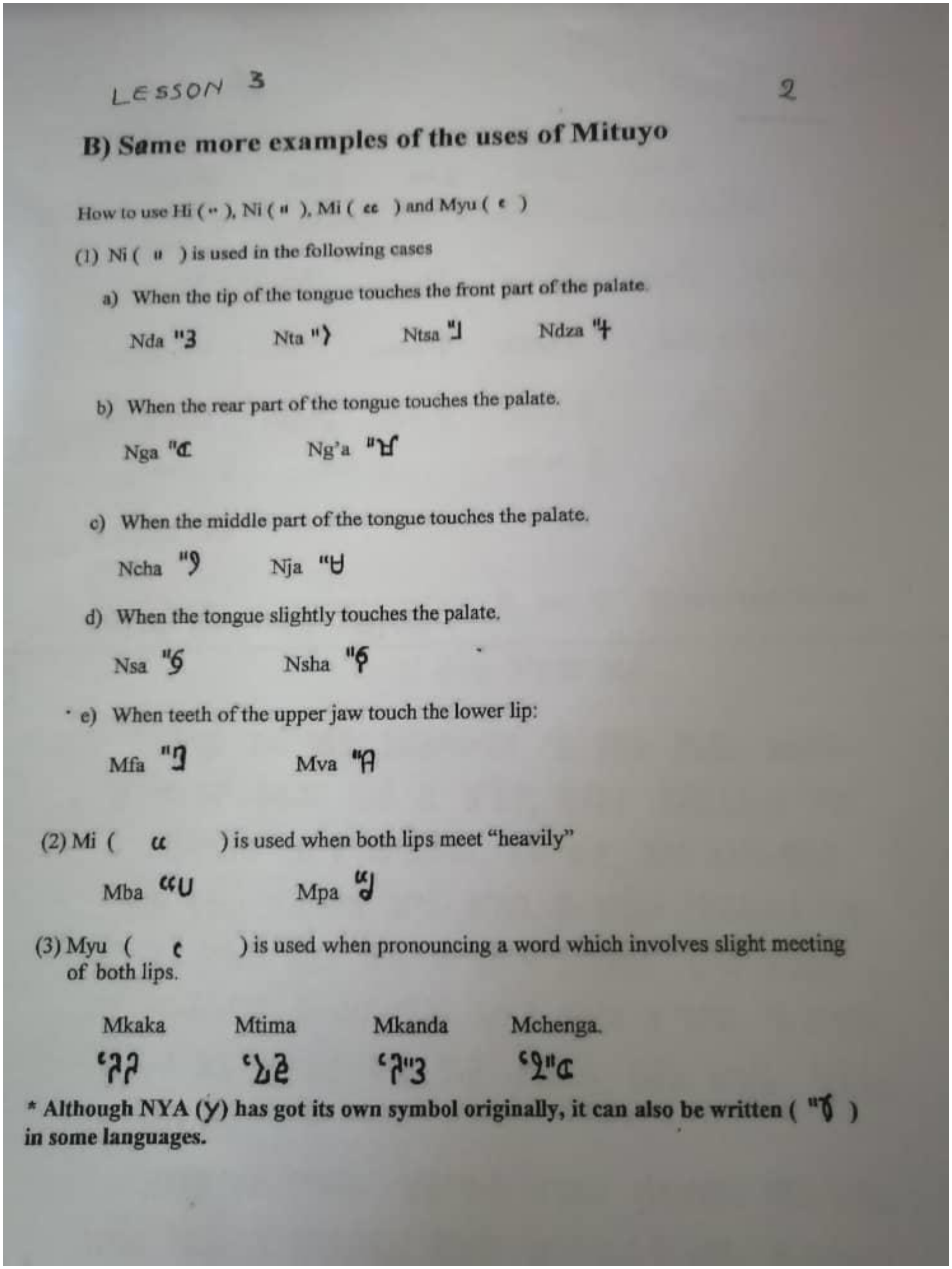
Figure 33. Exercise material of Misiri words for students to transliterate into the Mwangwego script.



Exercise 3: Mituyo words

1. atwimisya =
2. bwanthu =
3. bwanje =
4. bwenkha =
5. chakudya =
6. chakufwa =
7. chingale =
8. khondowe =
9. kwazizila =
10. mankhwala =
11. munthu =
12. ndalama =
13. njolomole =
14. nkhalango =
15. nsomba =
17. nsabwe =
18. ntcheu =
19. sitiloledwa =
20. tidzalandira =
21. tikambe =
22. tinkhani =
23. usandiyambe =
24. zinthu =
25. zithumwa =

Figure 34. Exercise material of Mituyo words for students to transliterate into the Mwangwego script.



LESSON 3

2

B) Same more examples of the uses of Mituyo

How to use Hi ( ), Ni ( ), Mi ( ) and Myu ( )

(1) Ni ( ) is used in the following cases

a) When the tip of the tongue touches the front part of the palate.

Nda Nta Ntsa Ndza

b) When the rear part of the tongue touches the palate.

Nga Ng'a

c) When the middle part of the tongue touches the palate.

Ncha Nja

d) When the tongue slightly touches the palate.

Nsa Nsha

• e) When teeth of the upper jaw touch the lower lip:

Mfa Mva

(2) Mi ( ) is used when both lips meet "heavily"

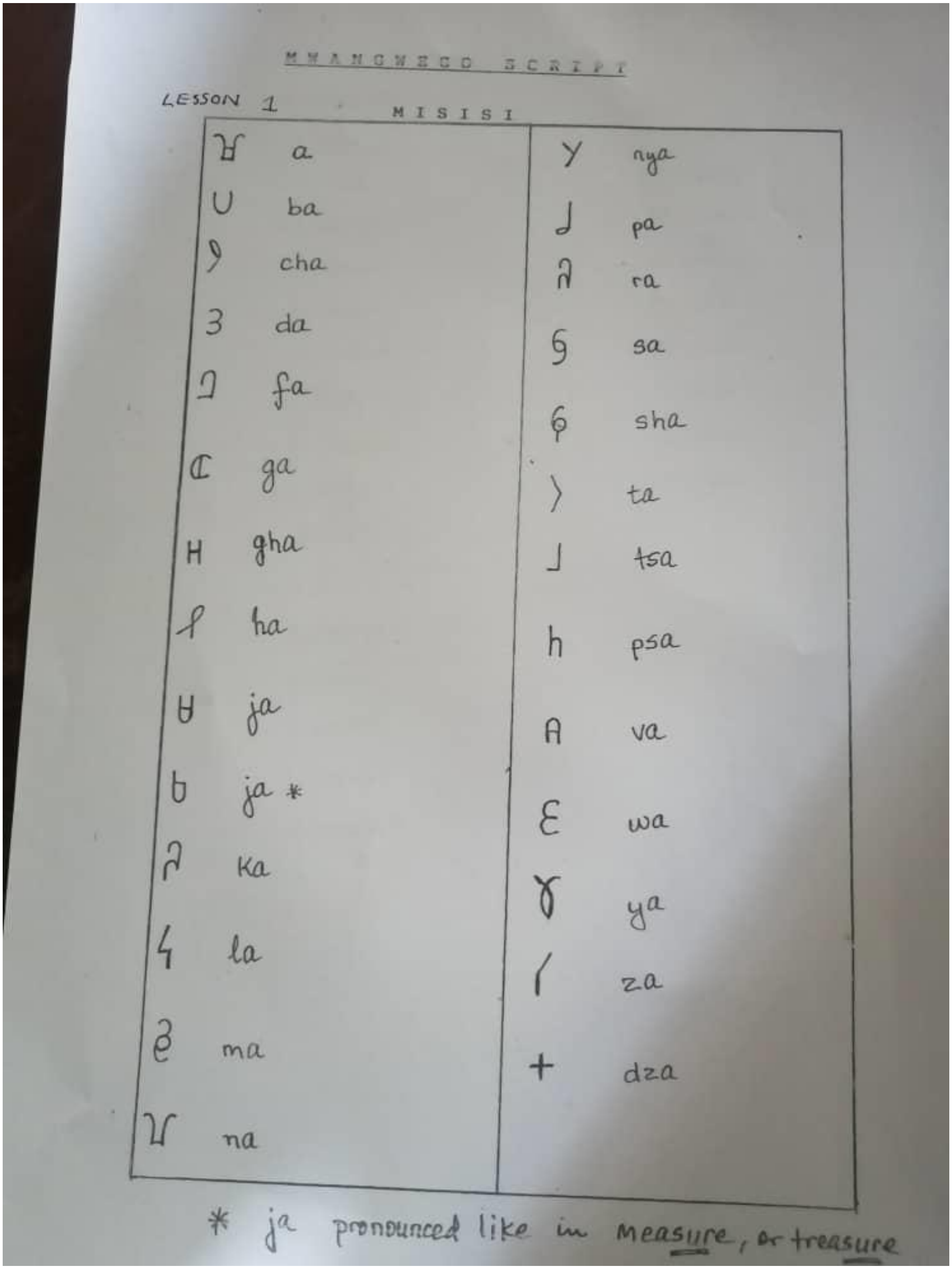
Mba Mpa

(3) Myu ( ) is used when pronouncing a word which involves slight meeting of both lips.

Mkaka Mtima Mkanda Mchenga.

*** Although NYA ( ) has got its own symbol originally, it can also be written ( ) in some languages.**

Figure 35. More exercise material for students to learn how to transliterate Mituyo words into the Mwangwego script.



MWANGWEGO SCRIPT

LESSON 1

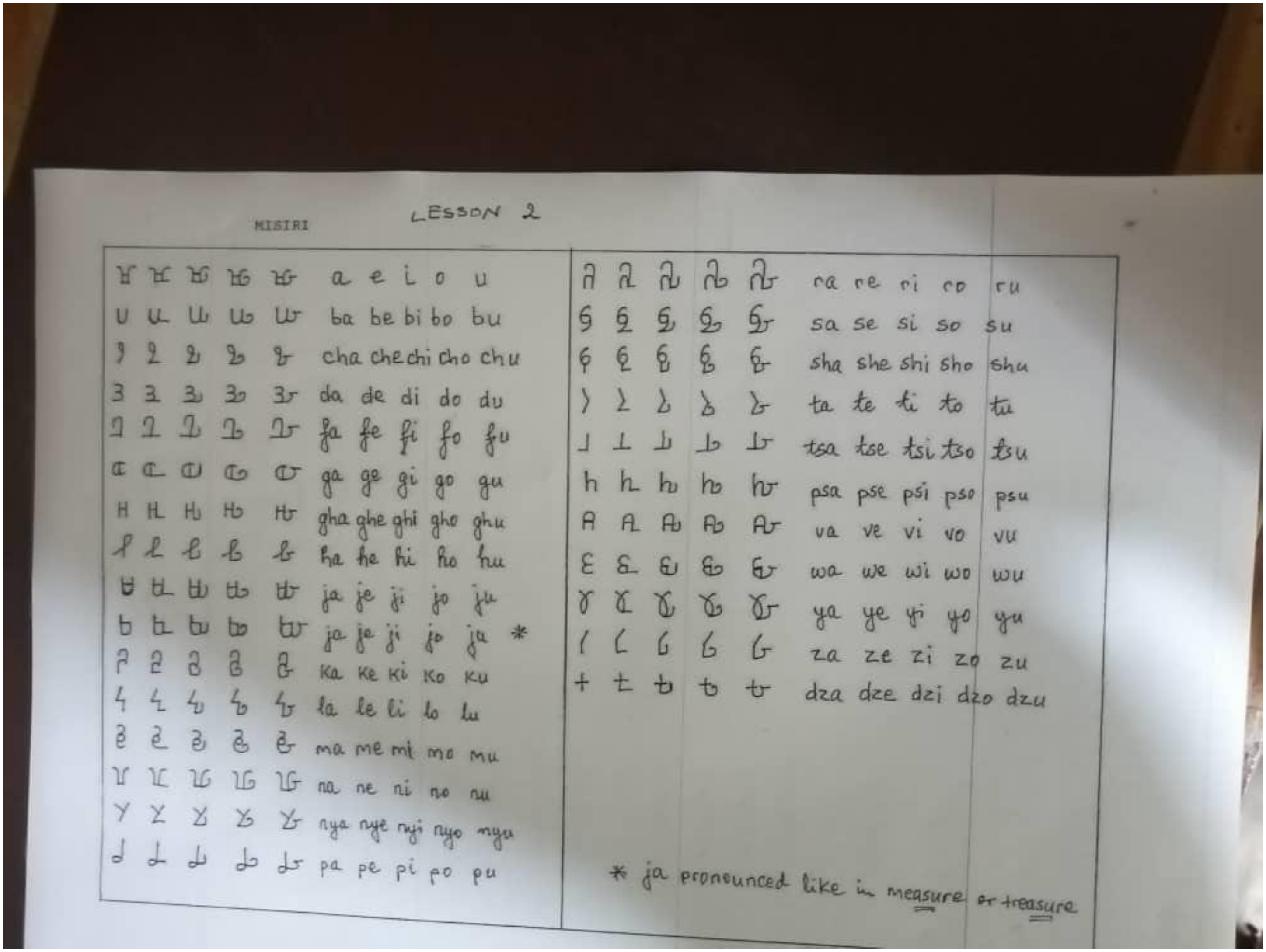
MISISI

a
ba
cha
da
fa
ga
gha
ha
ja
ja *
Ka
la
ma
na

nya
pa
ra
sa
sha
ta
tsa
psa
va
wa
ya
za
dza

* ja pronounced like in measure, or treasure

Figure 36. Educational material for Misisi (lesson 1).



MISIRI

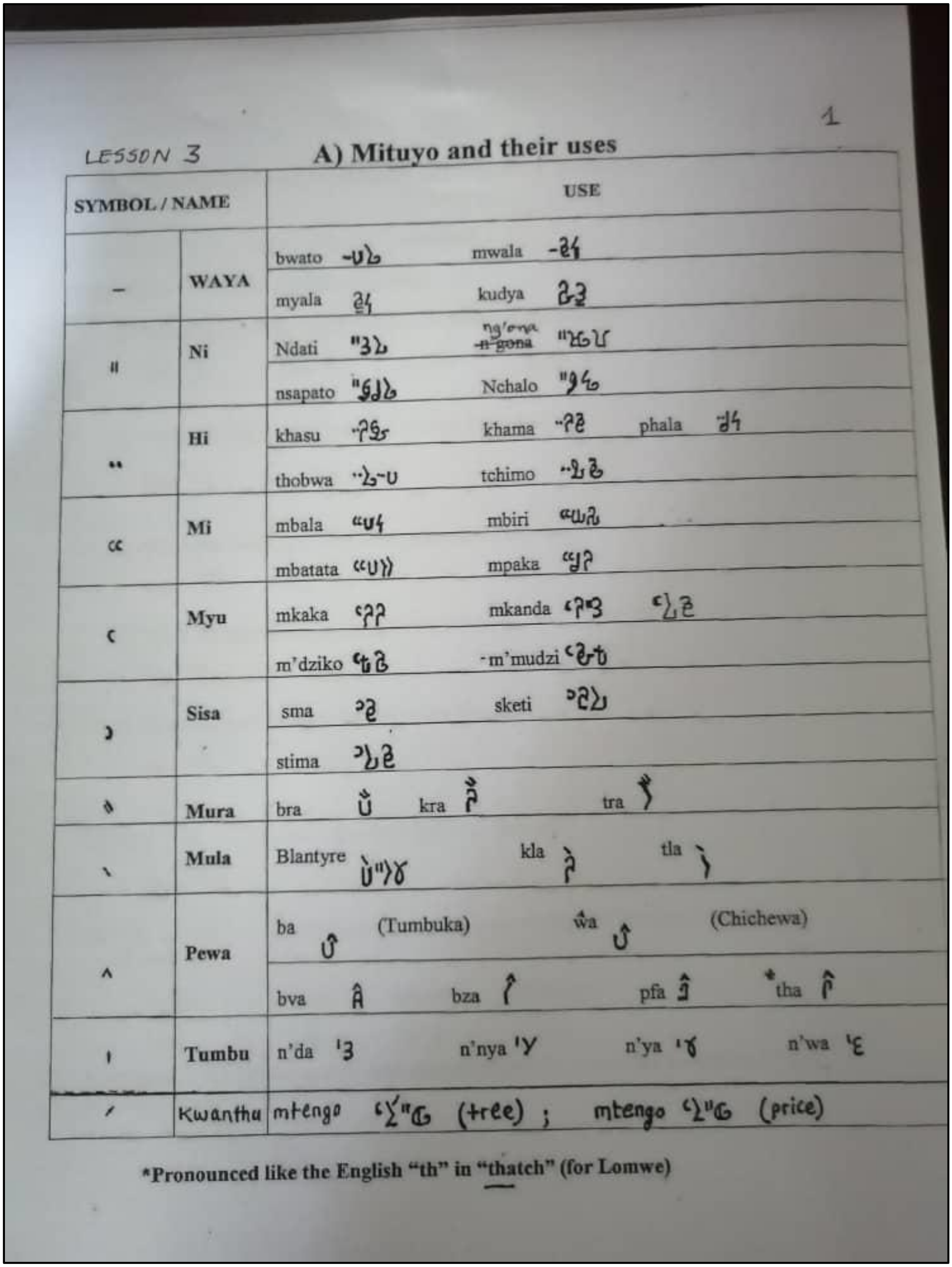
LESSON 2

a e i o u
ba be bi bo bu
cha che chi cho chu
da de di do du
fa fe fi fo fu
ga ge gi go gu
gha ghe ghi gho ghu
ha he hi ho hu
ja je ji jo ju
ja je ji jo ju *
Ka Ke Ki Ko Ku
la le li lo lu
ma me mi mo mu
na ne ni no nu
nya nye nyi nyo nyu
pa pe pi po pu

ra re ri ro ru
sa se si so su
sha she shi sho shu
ta te ti to tu
tsa tse tsi tso tsu
psa pse psi pso psu
va ve vi vo vu
wa we wi wo wu
ya ye yi yo yu
za ze zi zo zu
dza dze dzi dzo dzu

* ja pronounced like in measure or treasure

Figure 37. Educational material for Misiri (lesson 2).



1

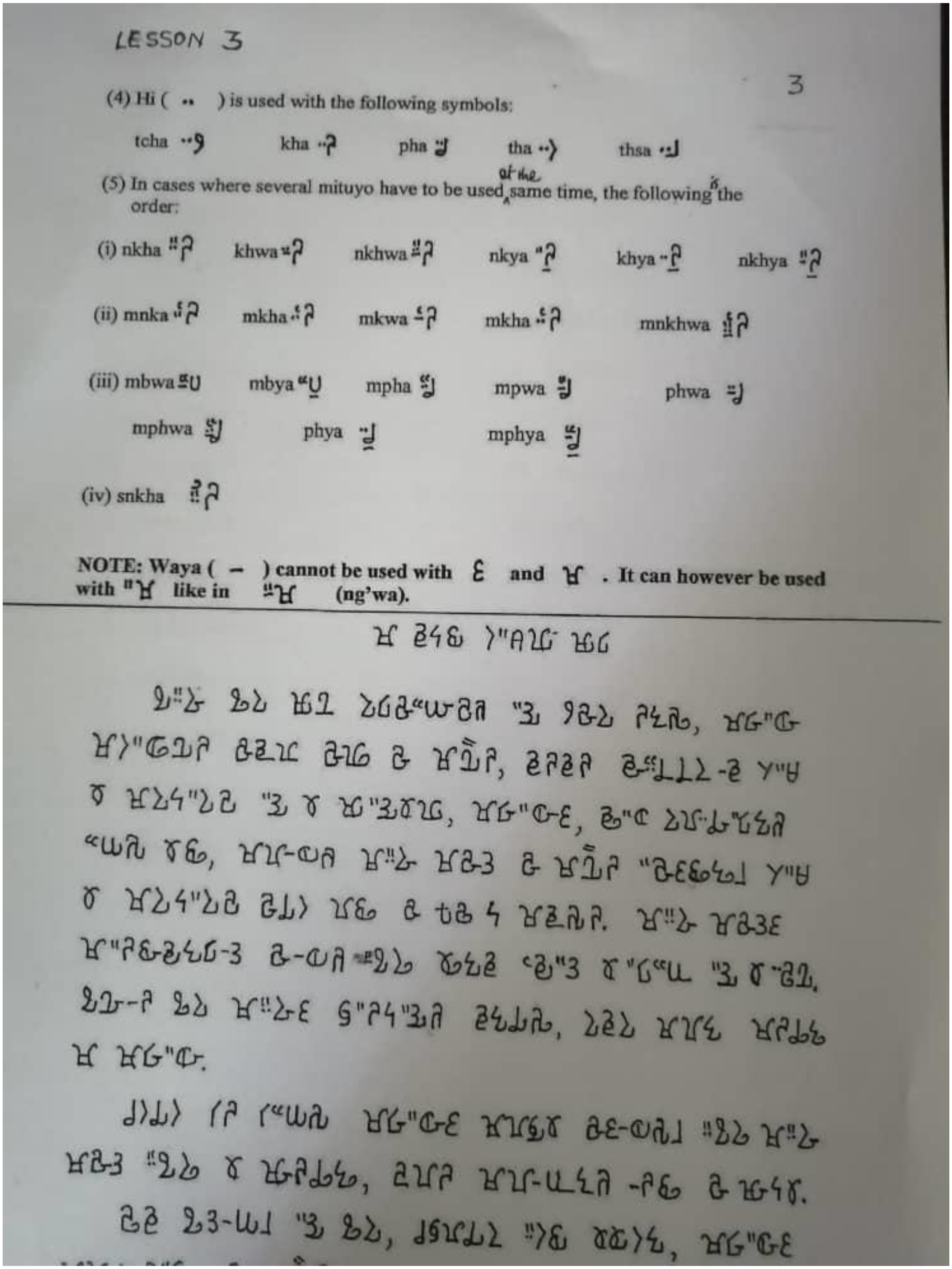
LESSON 3

A) Mituyo and their uses

SYMBOL / NAME		USE
–	WAYA	bwato mwala myala kudya
"	Ni	Ndati ng'ona ~~n gona~~ nsapato Nchalo
••	Hi	khasu khama phala thobwa tchimo
«	Mi	mbala mbiri mbatata mpaka
‹	Myu	mkaka mkanda m'dziko -m'mudzi
ɔ	Sisa	sma sketi stima
	Mura	bra kra tra
`	Mula	Blantyre kla tla
^	Pewa	ba (Tumbuka) ŵa (Chichewa) bva bza pfa *tha
'	Tumbu	n'da n'nya n'ya n'wa
/	Kwantha	mtengo (tree) ; mtengo (price)

*Pronounced like the English "th" in "thatch" (for Lomwe)

Figure 38. Educational material for Mituyo (lesson 3).



LESSON 3

3

(4) Hi ( ) is used with the following symbols:

tcha   kha   pha   tha   thsa

(5) In cases where several mituyo have to be used at the same time, the following is the order:

(i) nkha   khwa   nkhwa   nkya   khya   nkhya

(ii) mnka   mkha   mkwa   mkha   mnkhwa

(iii) mbwa   mbya   mpha   mpwa   phwa

mphwa   phya   mphya

(iv) snkha

NOTE: Waya ( ) cannot be used with and . It can however be used with like in (ng'wa).

Figure 39. More educational material for Mituyo (lesson 3) and a reinforcement reading exercise.

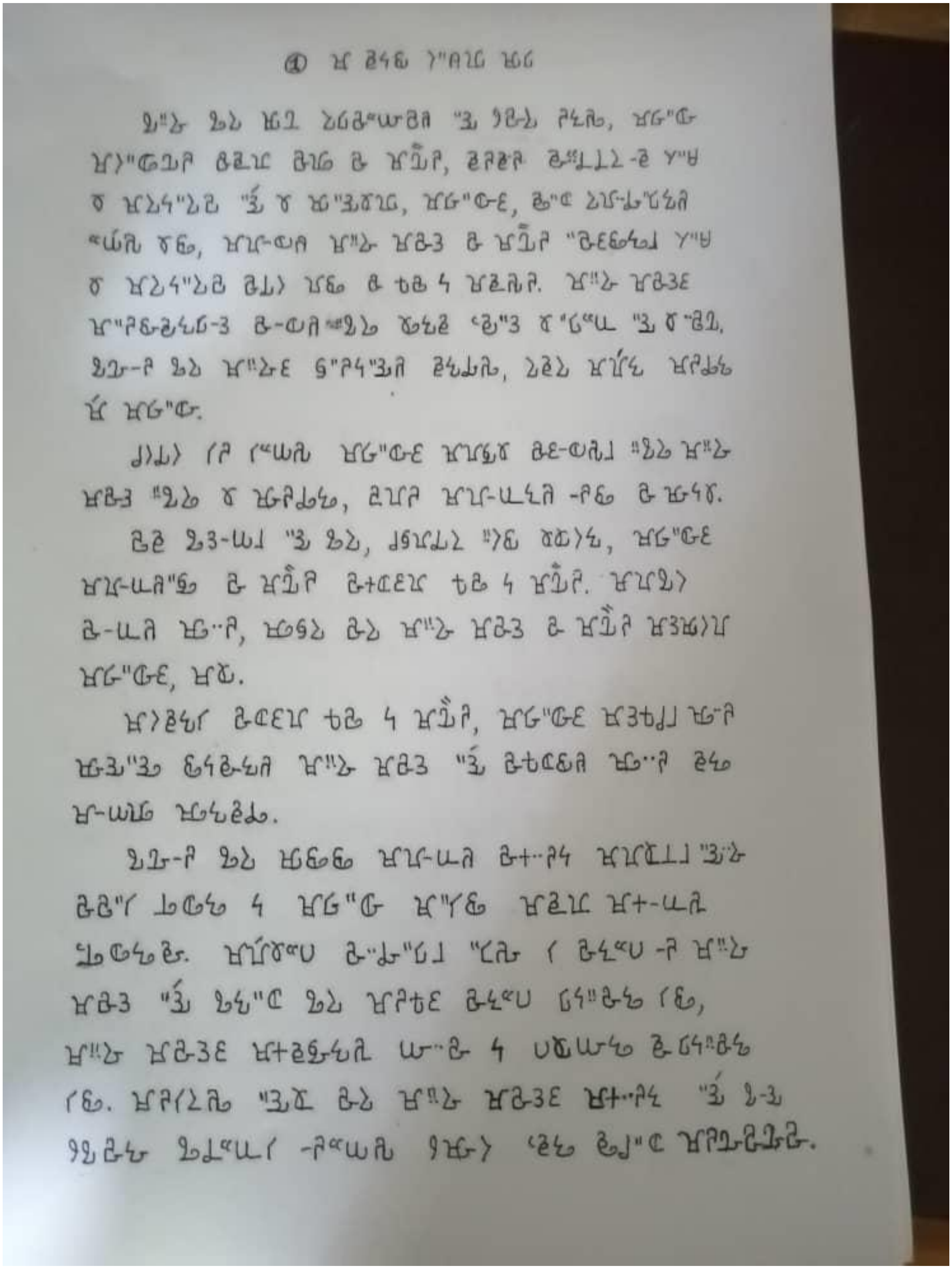


Figure 40. Educational material of paragraphs used for reading practice.

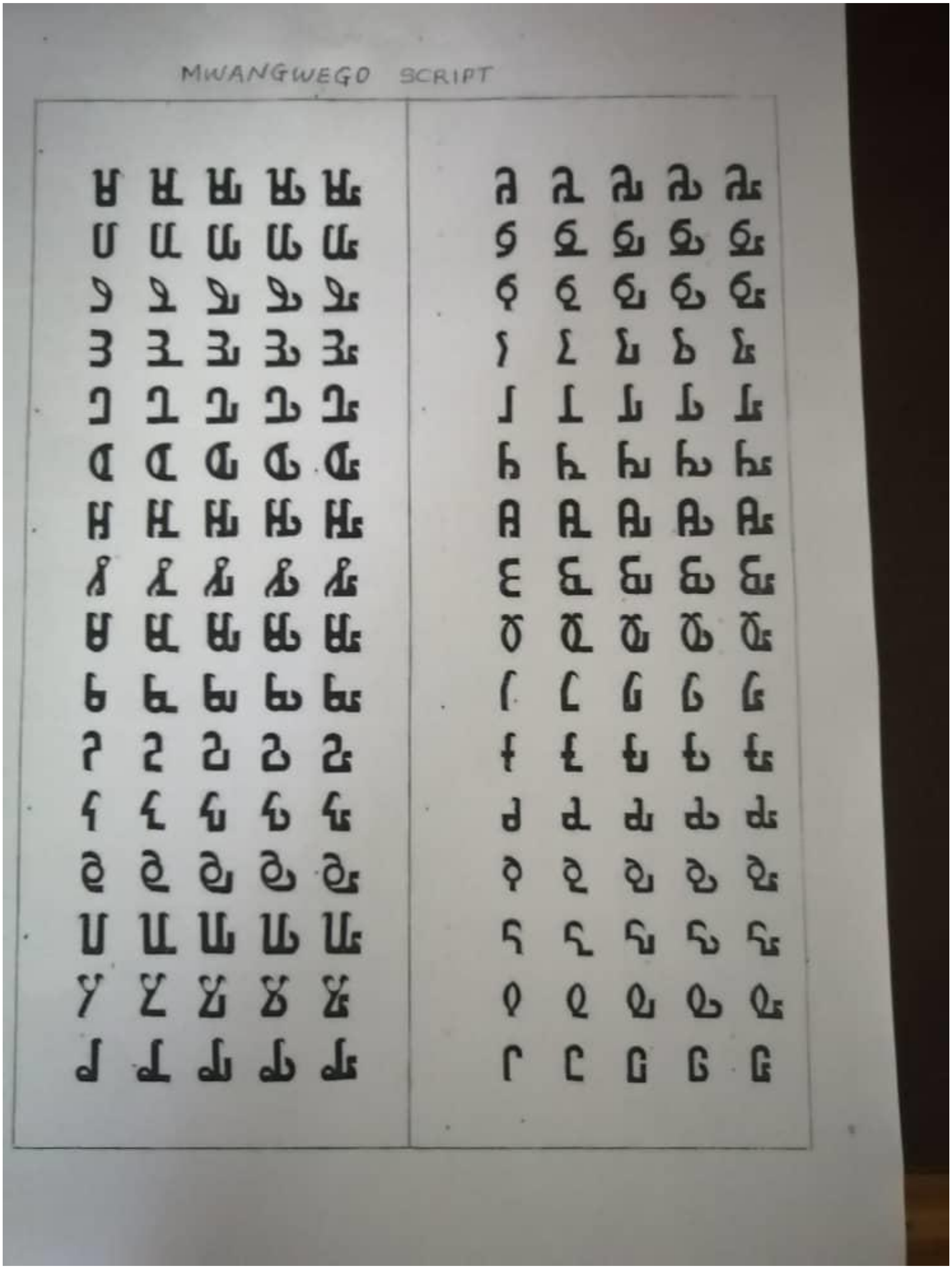

MWANGWEGO SCRIPT

Figure 41. Educational material used to teach the basic syllabic graphemes of the Mwangwego script.

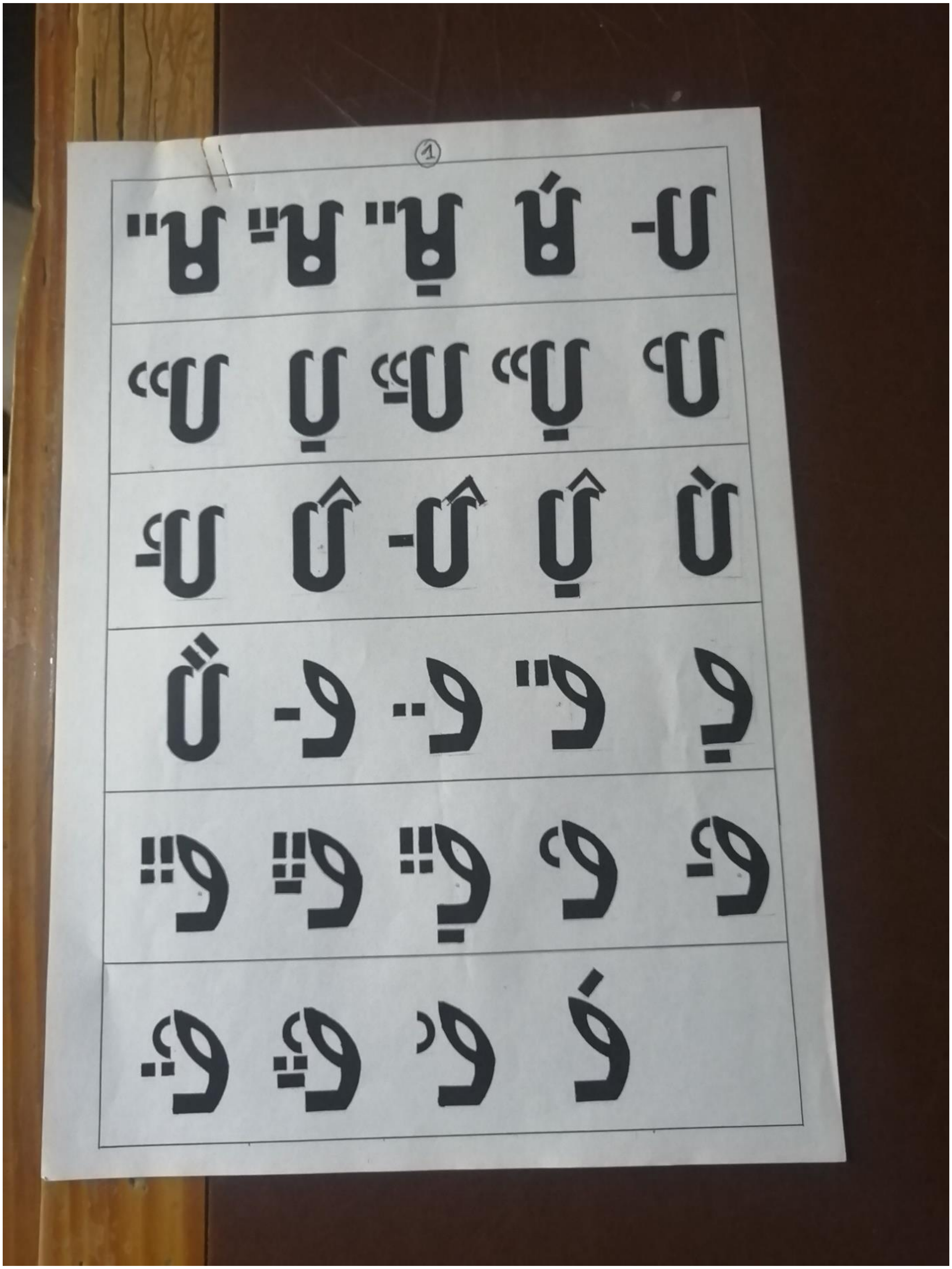


Figure 42. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering).

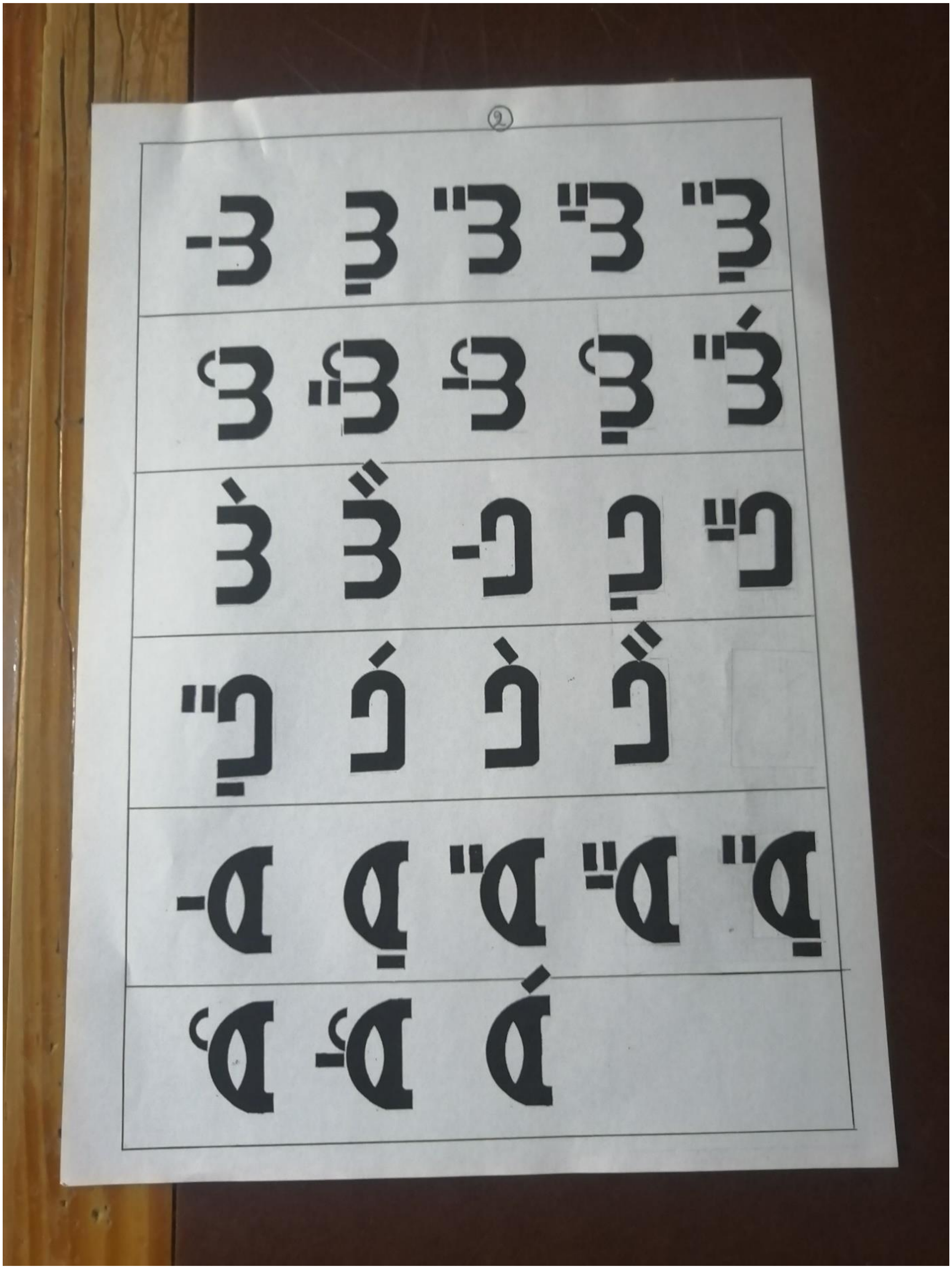


Figure 43. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering).

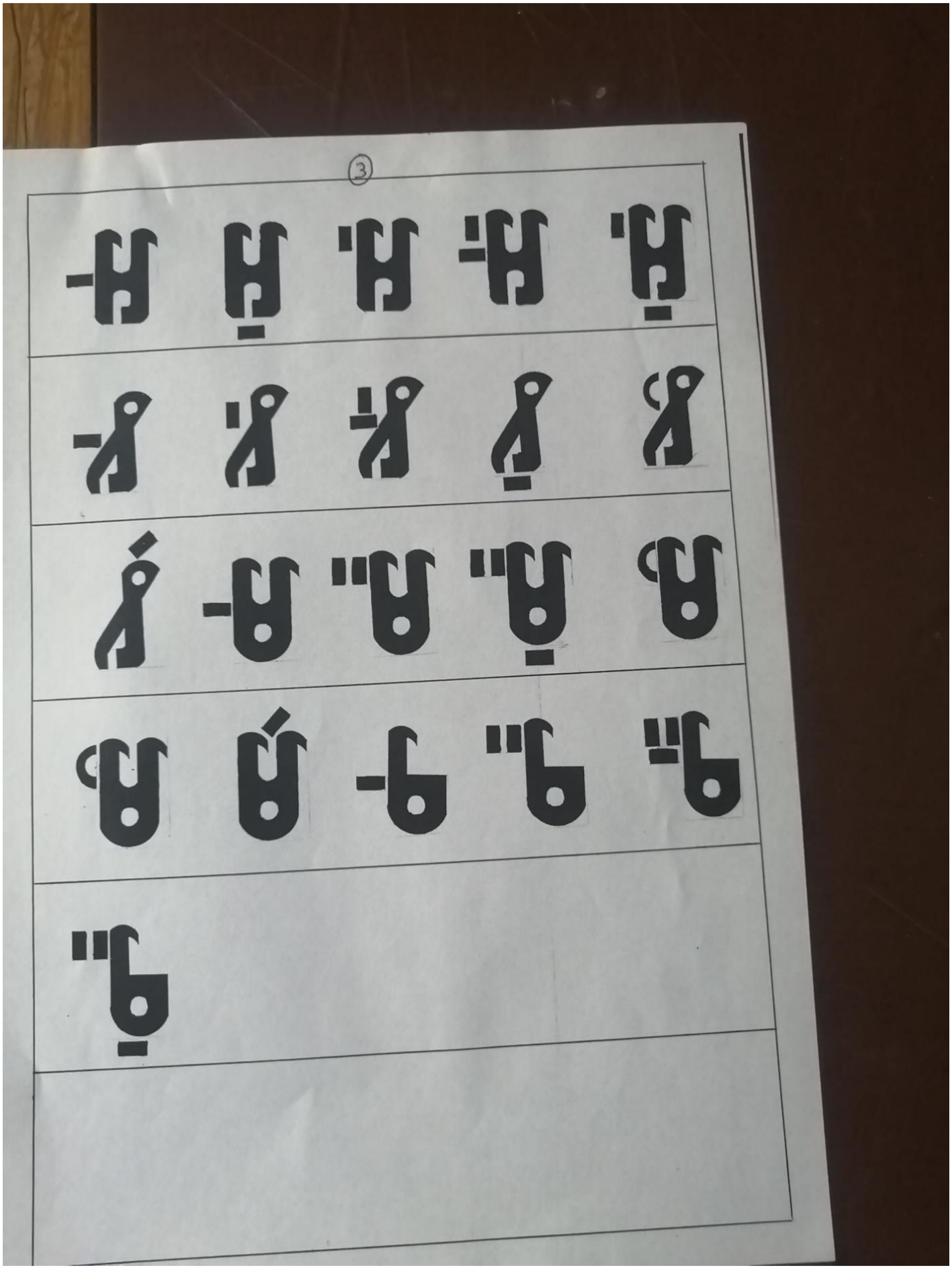


Figure 44. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering). ‘Ʊ is accidentally repeated twice here.

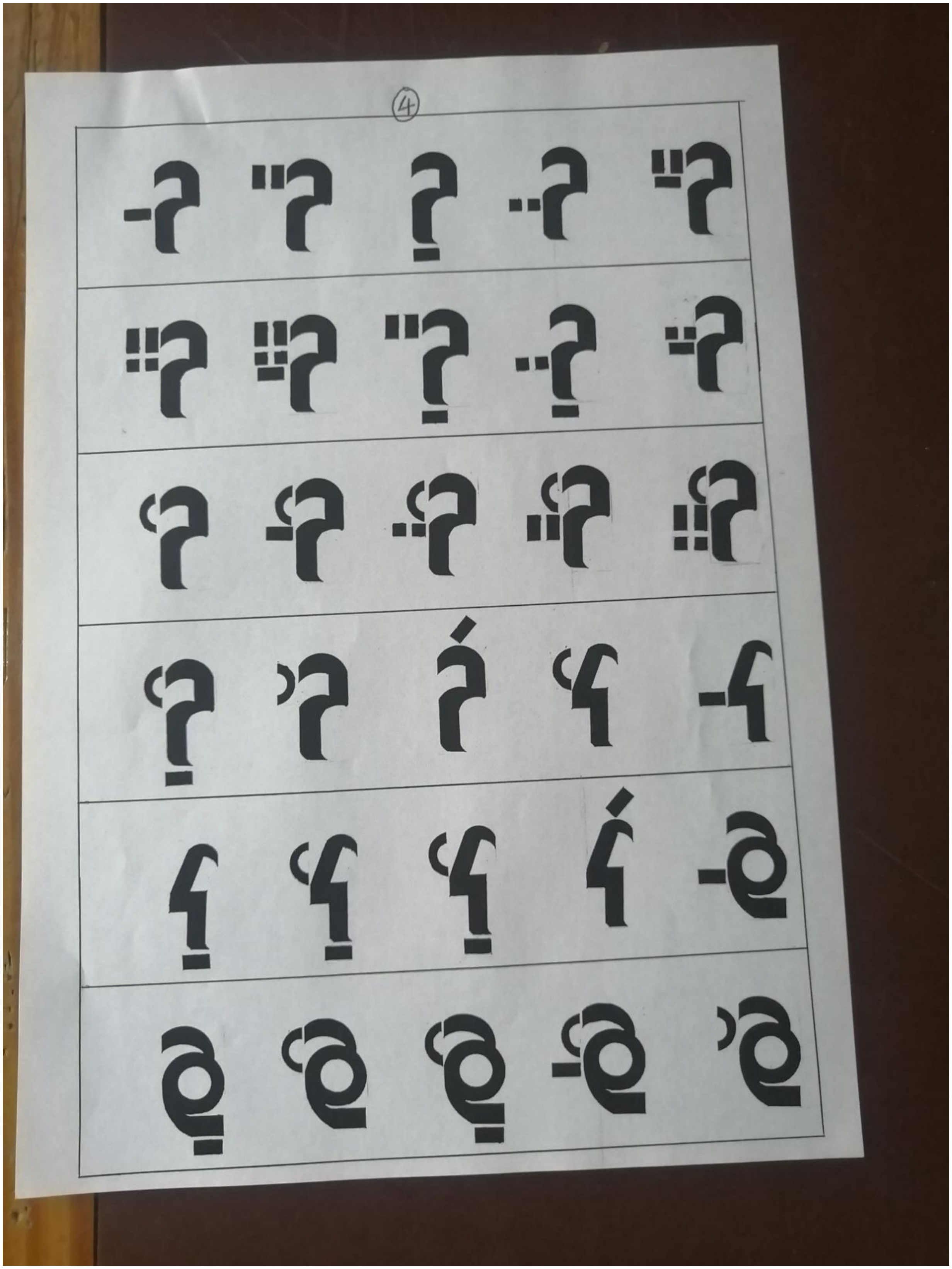


Figure 45. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering). ‘ꜭ̱ is accidentally repeated twice here.

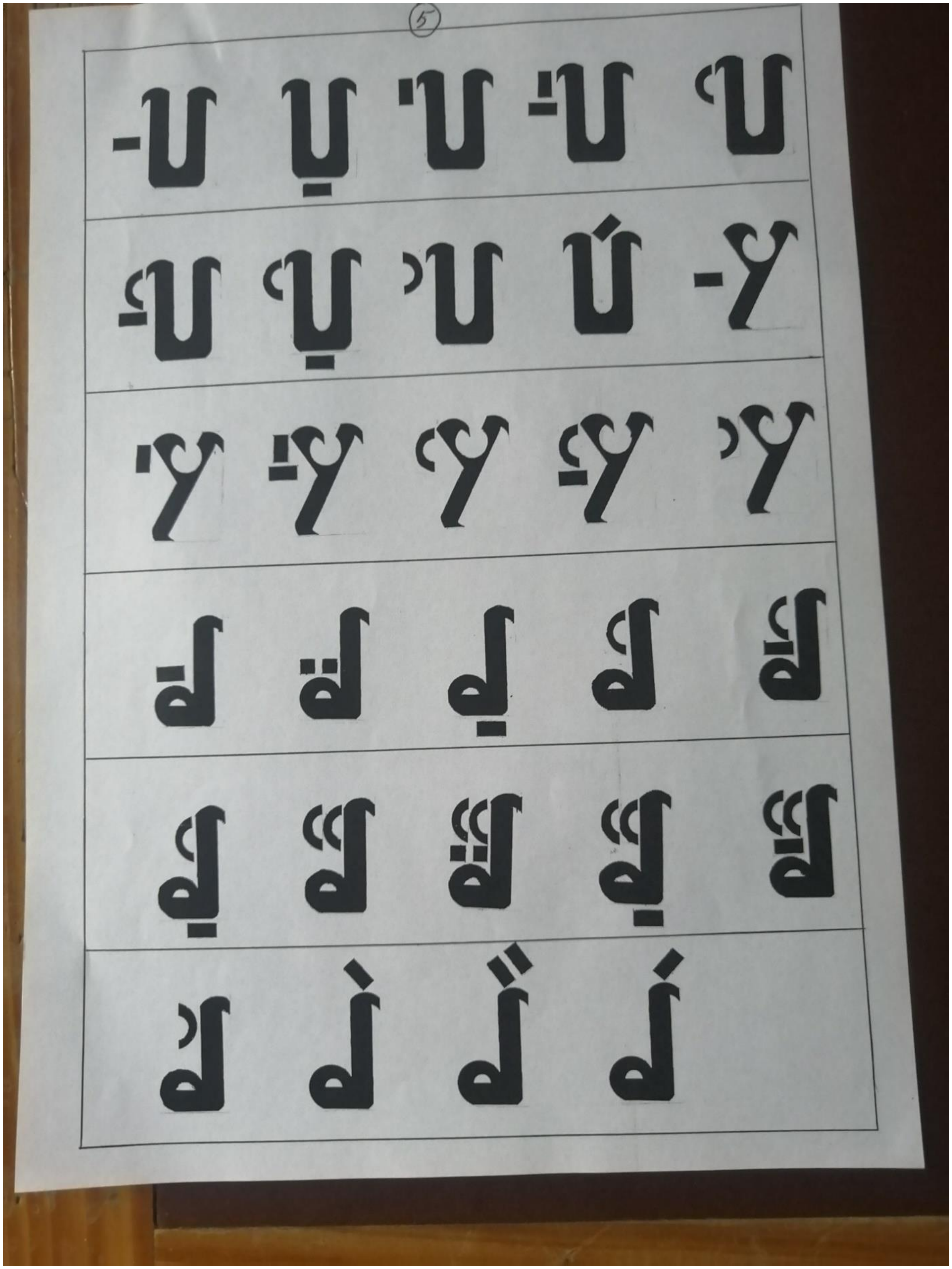


Figure 46. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering).

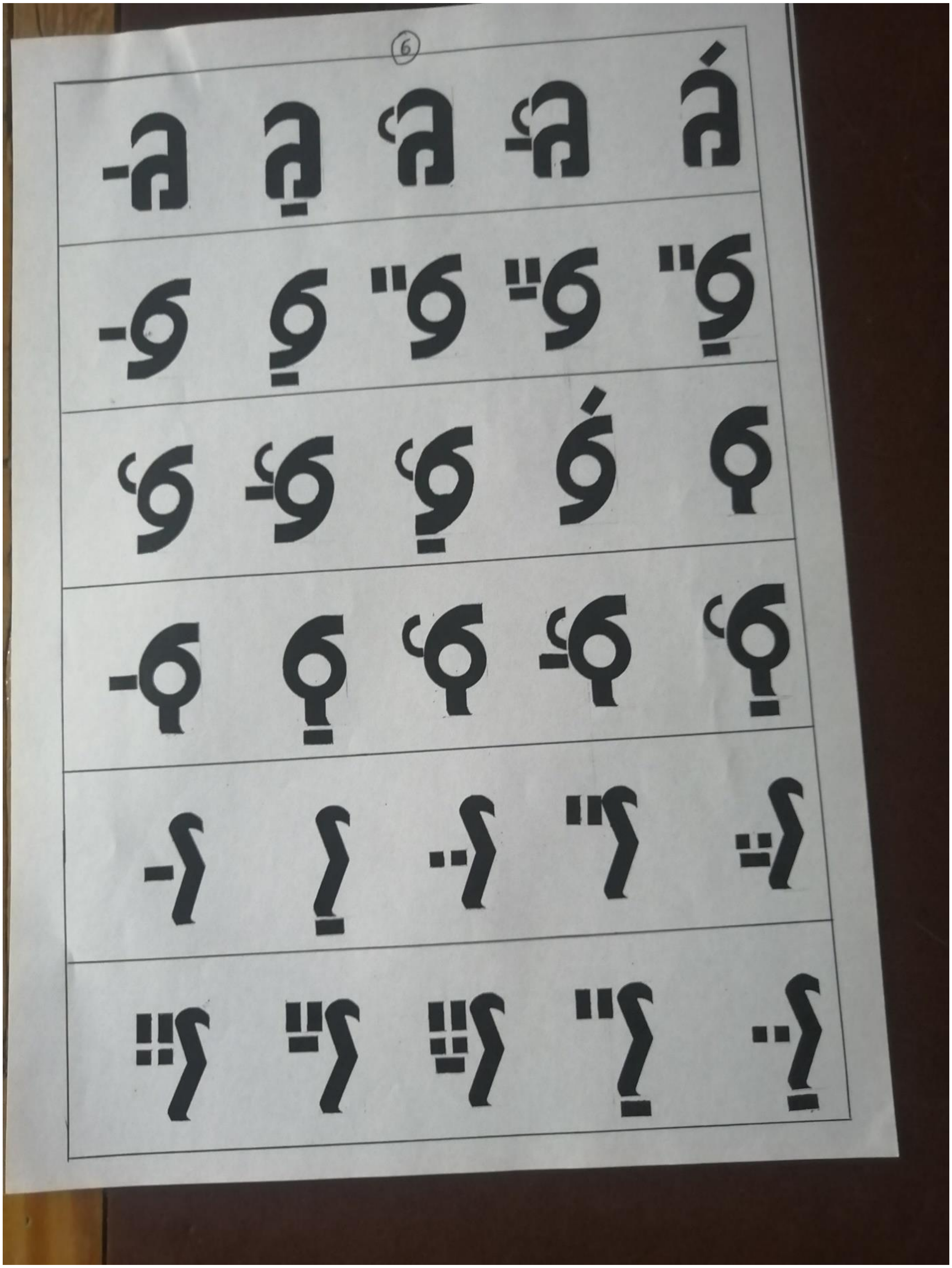


Figure 47. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering). A lone ϙ Musisi was accidentally typed in this picture.

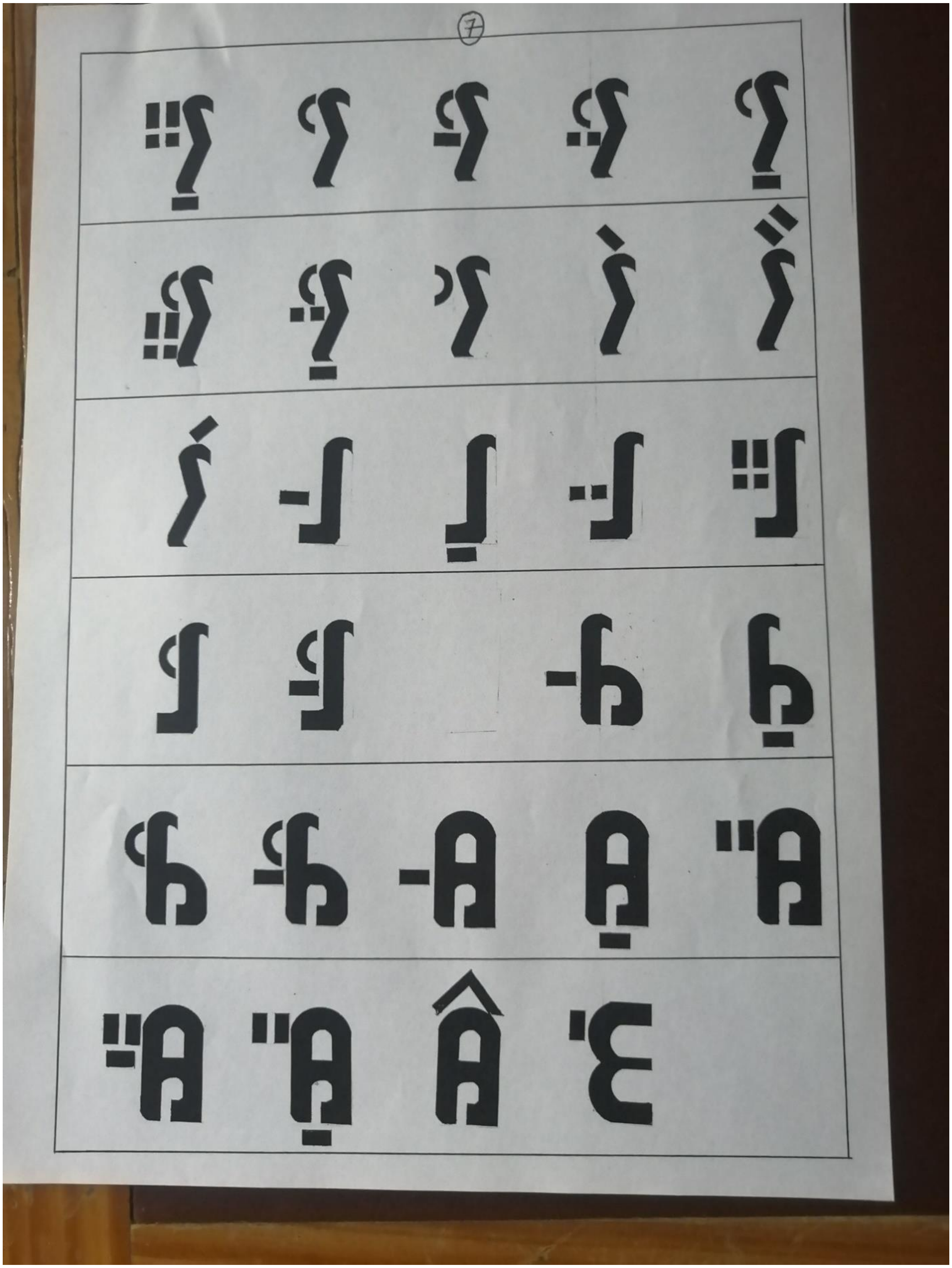


Figure 48. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering).

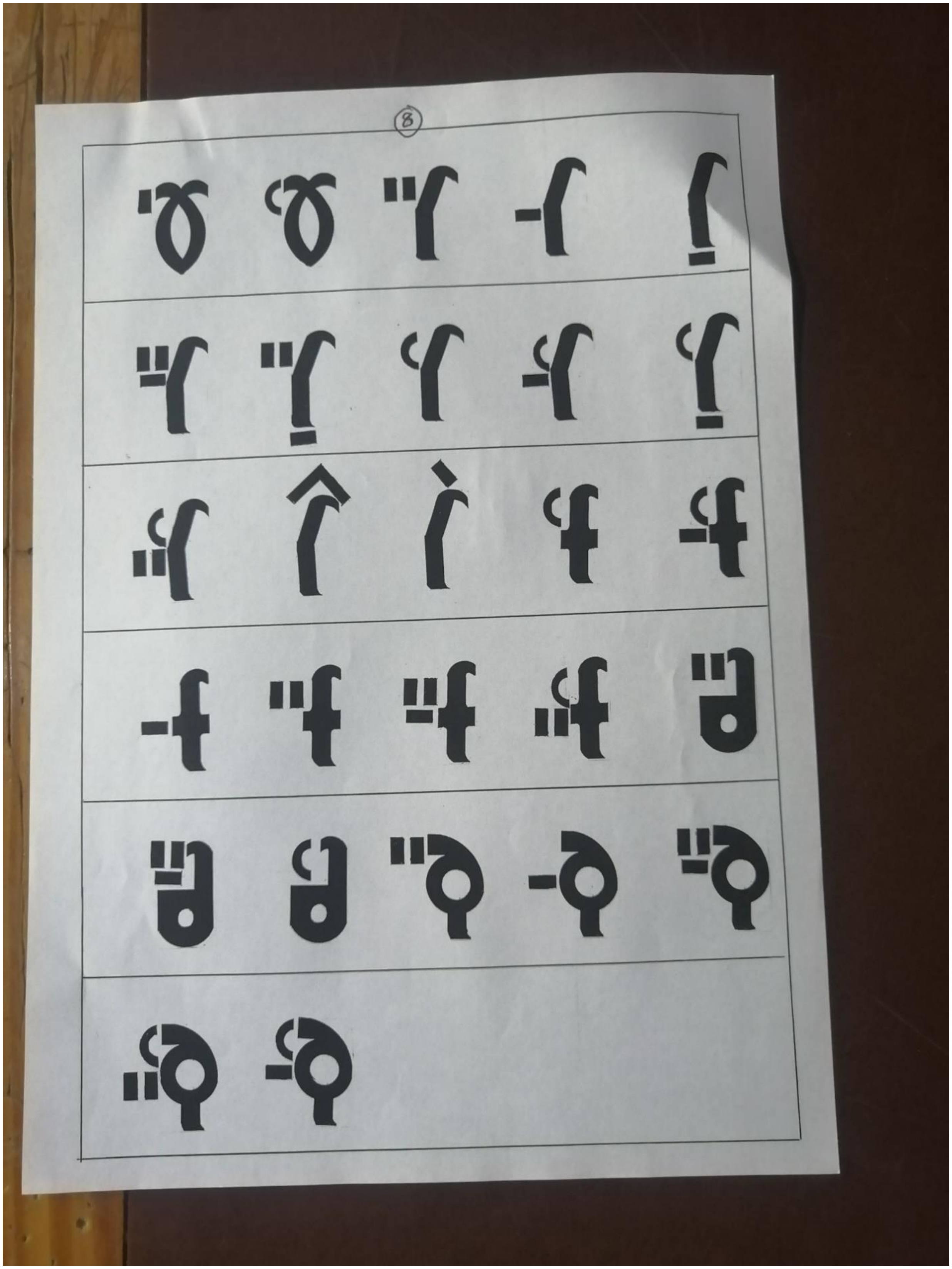


Figure 49. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering).

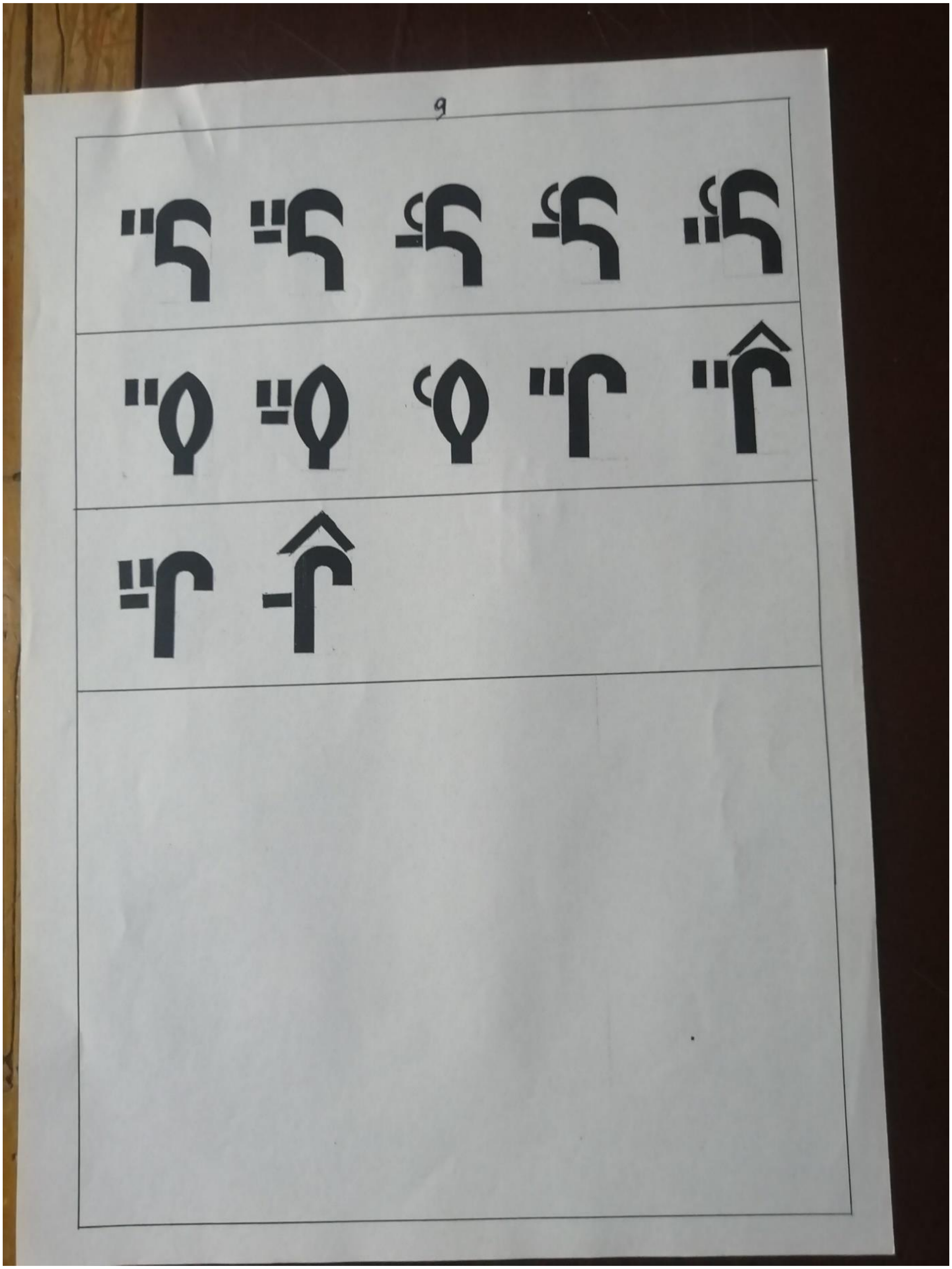
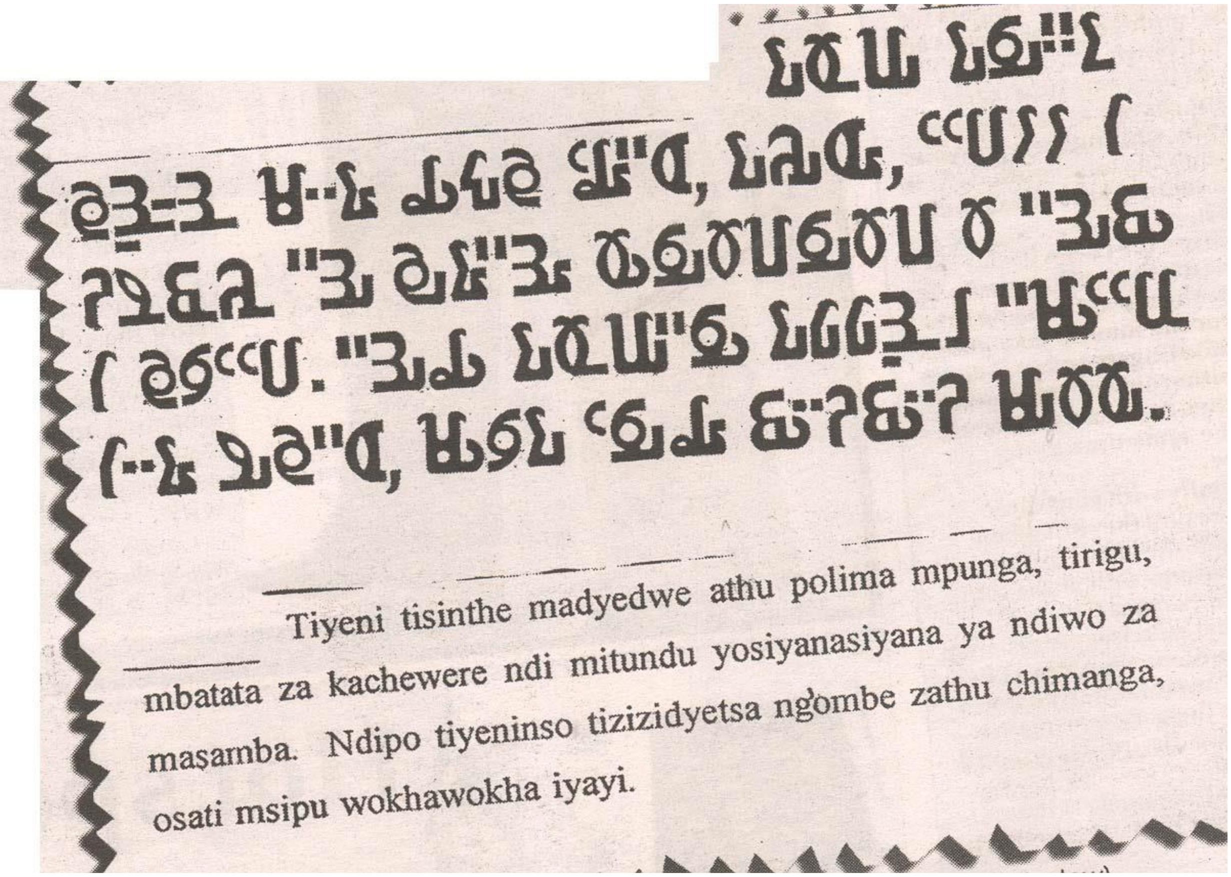


Figure 50. Most of the possible Mutuyo & Mituyo attachments onto Misisi (not according to collation/ordering). ʕ is accidentally repeated twice here.



Tiyeni tisinthe madyedwe athu polima mpunga, tirigu, mbatata za kachewere ndi mitundu yosiyanasiyana ya ndiwo za masamba. Ndipo tiyeninso tizizidyetsa ngʼombe zathu chimanga, osati msipu wokhawokha iyayi.

Figure 51. Typed material with Latin transliteration below. English translation: “*Let’s diversify our diet by growing rice, wheat, Irish potatoes and different types of vegetables. Let us feed our cattle with grains as well, not just fodder.*”

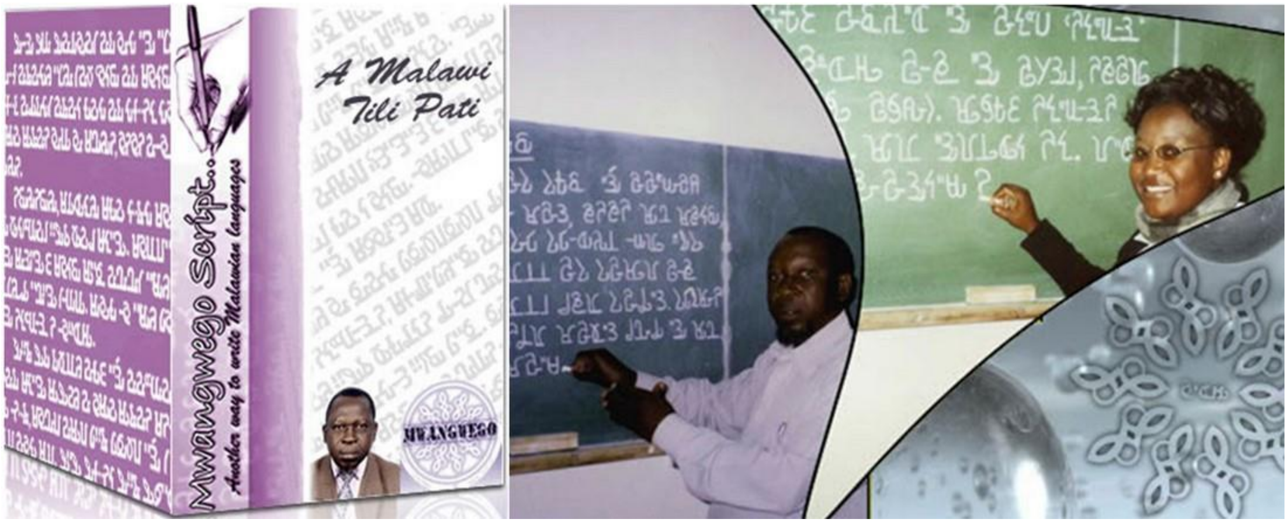

A Malawi
Tili Pati
Mwangwego Script...
Another way to write Malawian languages
MWANGWEGO

Figure 52. Nolence Mwangwego teaching the Mwangwego script (center); a student (right); book cover of “[illegible]?” (left).

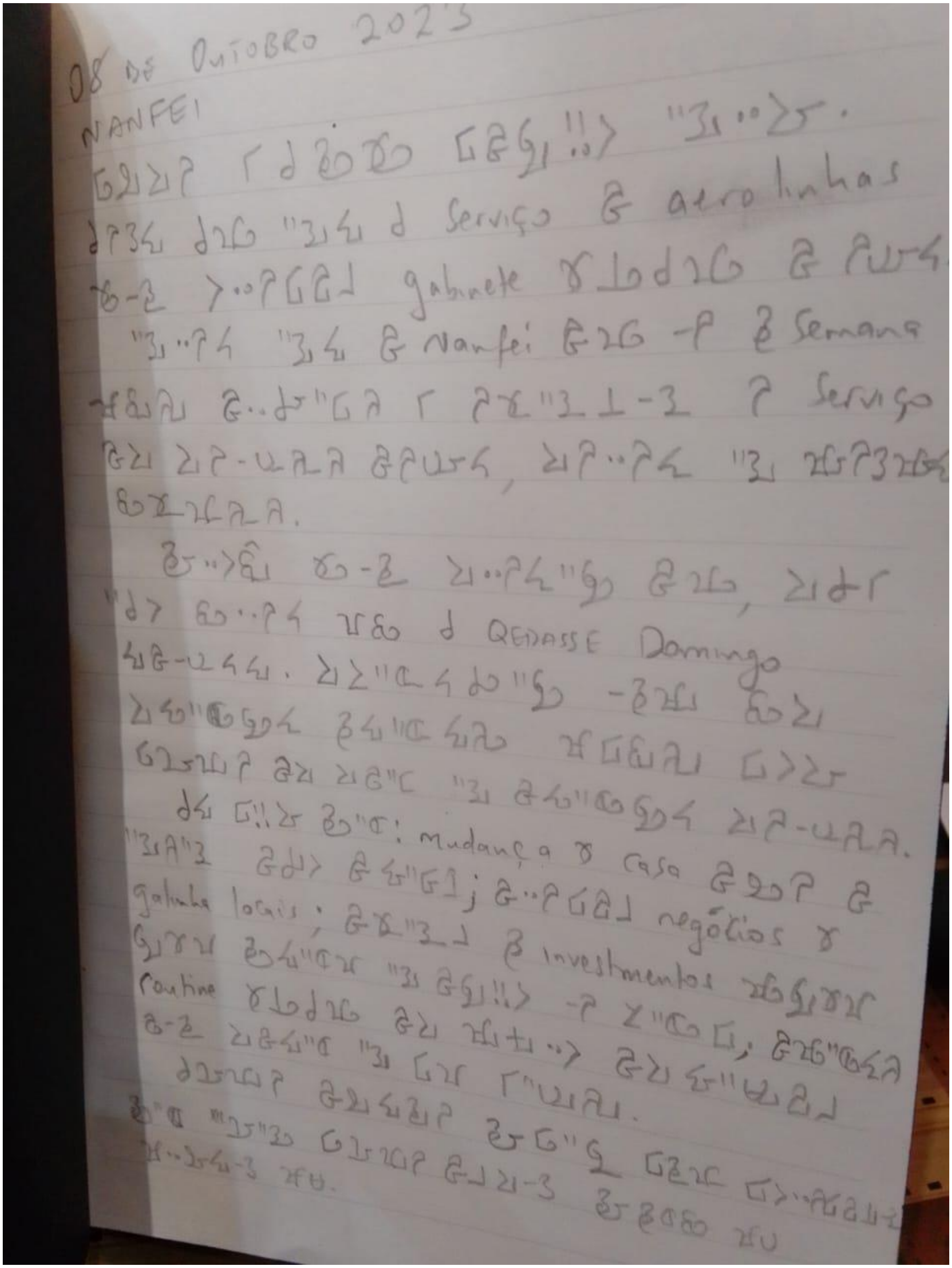


Figure 53. Chichewa-language handwriting by a Malawian user. This image showcases some intralinear Portuguese words in the Latin script (important to typographers) as the user is a businessman that conducts international business in Portuguese.

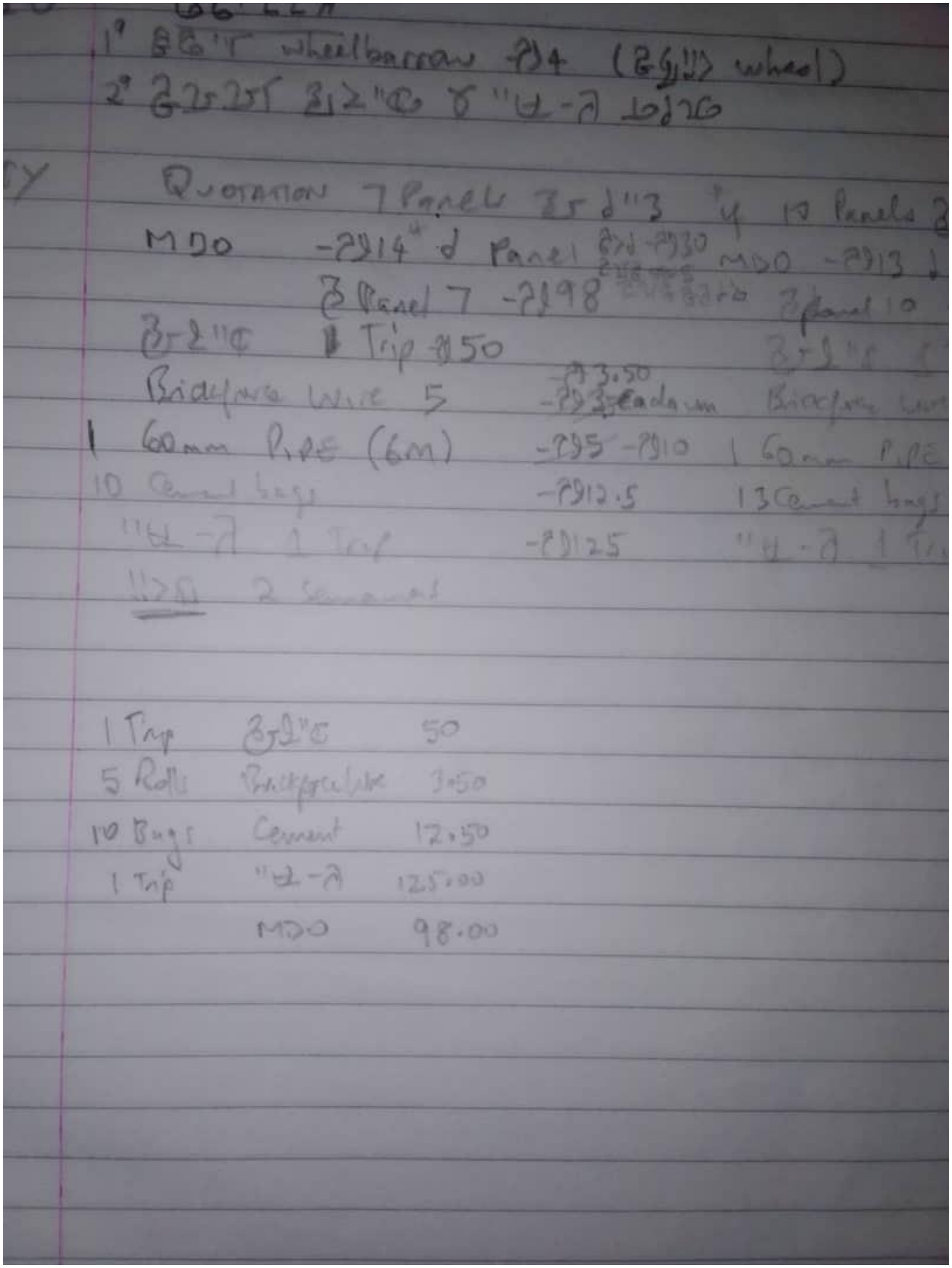


Figure 54. Chichewa-language handwriting by a Malawian user. This image showcases intralinear English words in the Latin script (important to typographers).

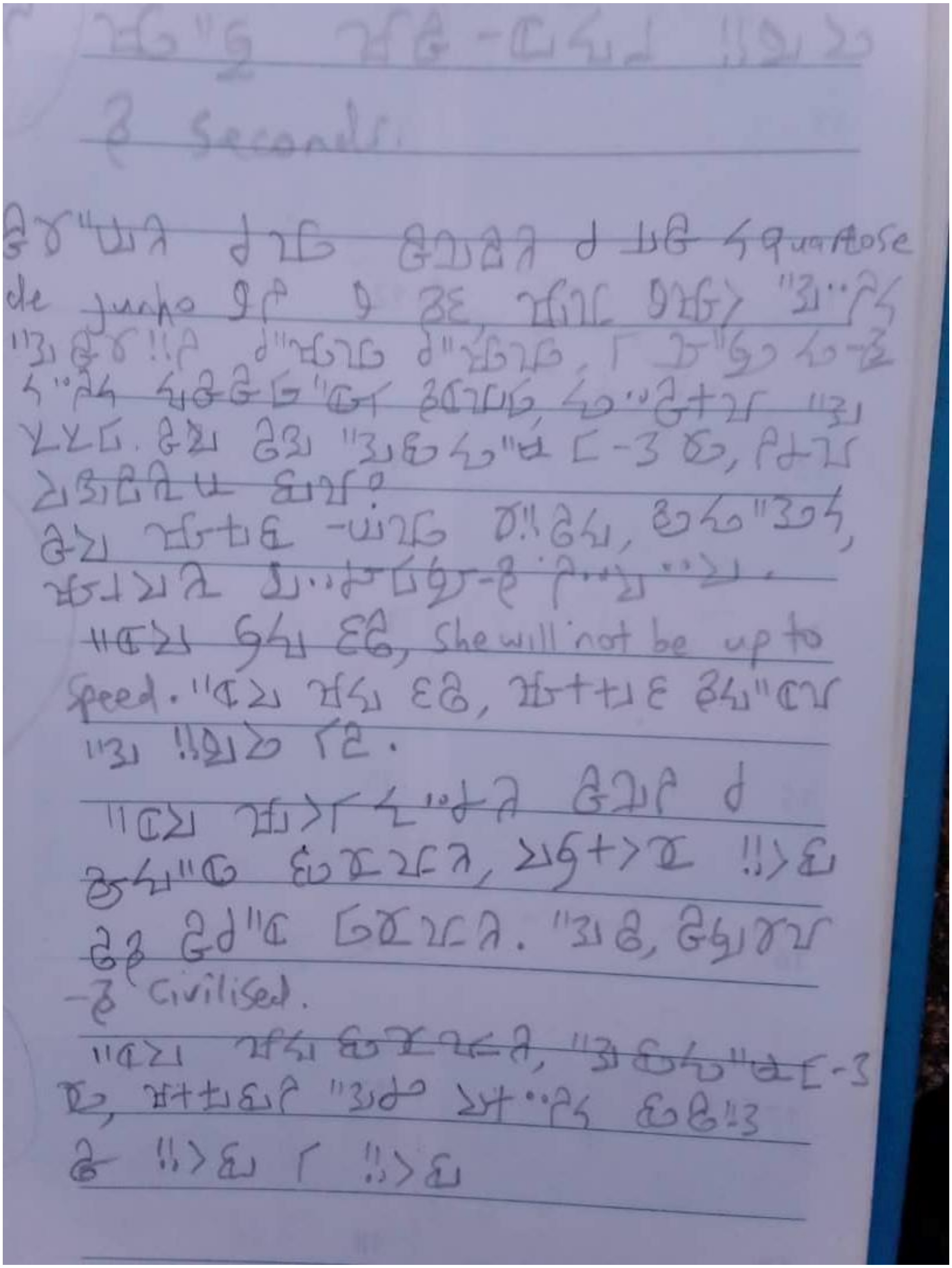

3 seconds.
quatose
de junho
She will not be up to
Speed.
Civilised.

Figure 55. Chichewa-language handwriting by a Malawian user. This image showcases a few intralinear English words in the Latin script (important to typographers).

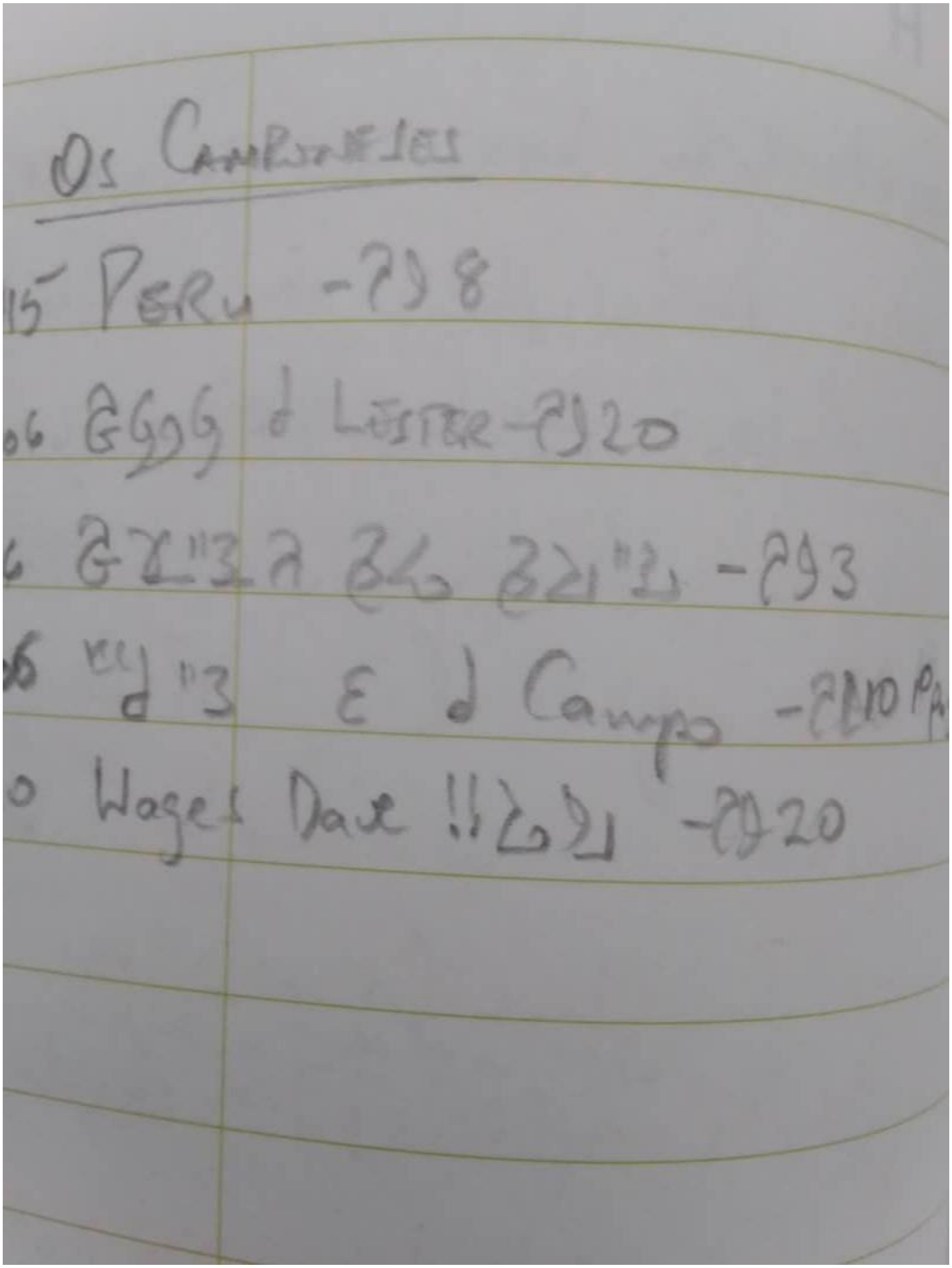


Figure 56. Chichewa-language handwriting by a Malawian user. This image showcases intralinear English words in the Latin script (important to typographers).

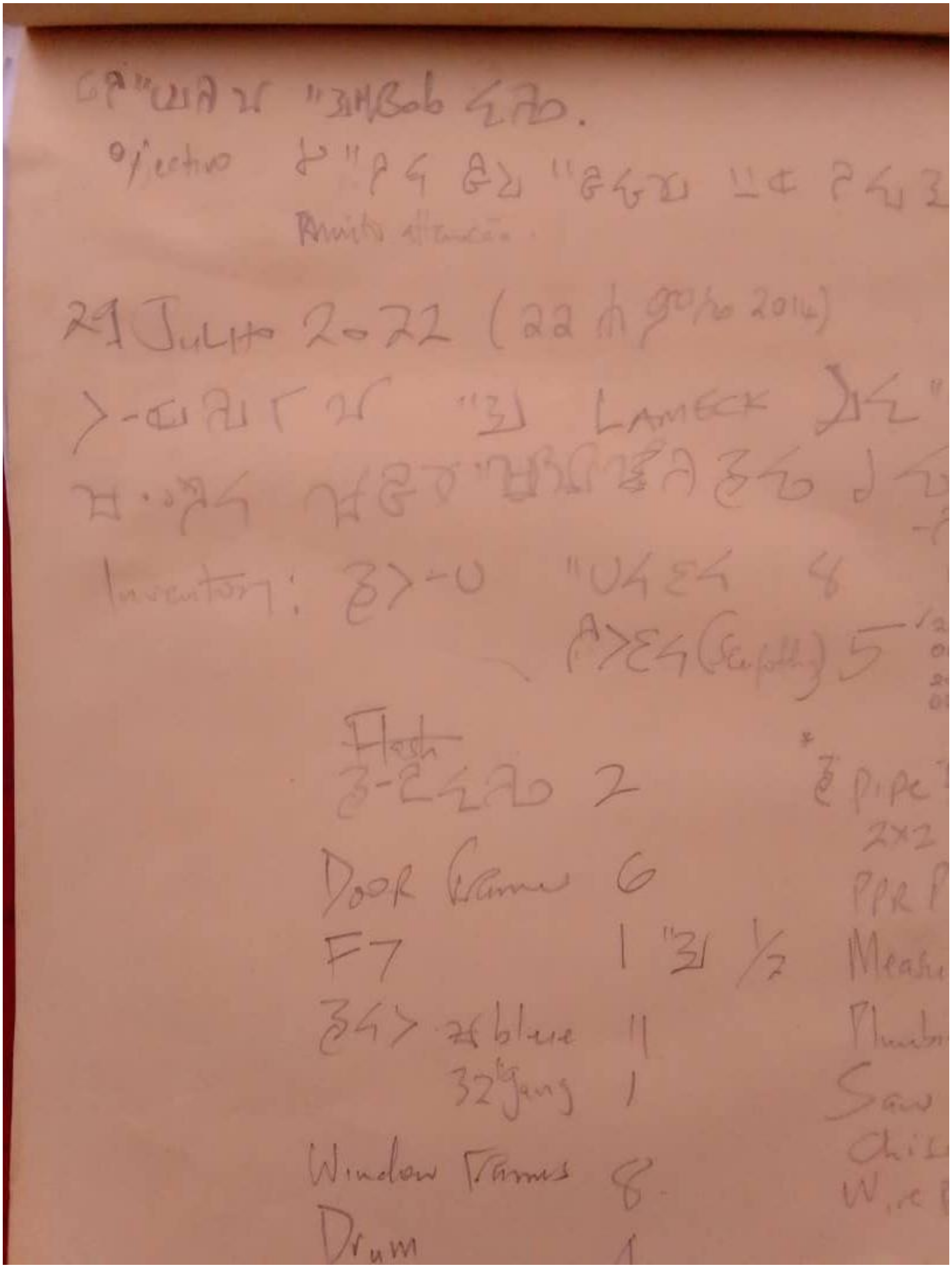

Objectivo
29 Julho 2022 (22 de agosto 2014)
LAMECK
Inventory:
~~Flesh~~
pipe
2x2
PPR
Door Frame 6
F7
blue 11
32 gang 1
Saw
Window Frames 8
Drum 1

Figure 57. Chichewa-language handwriting by a Malawian user. This image showcases a few intralinear English words in the Latin script (important to typographers).

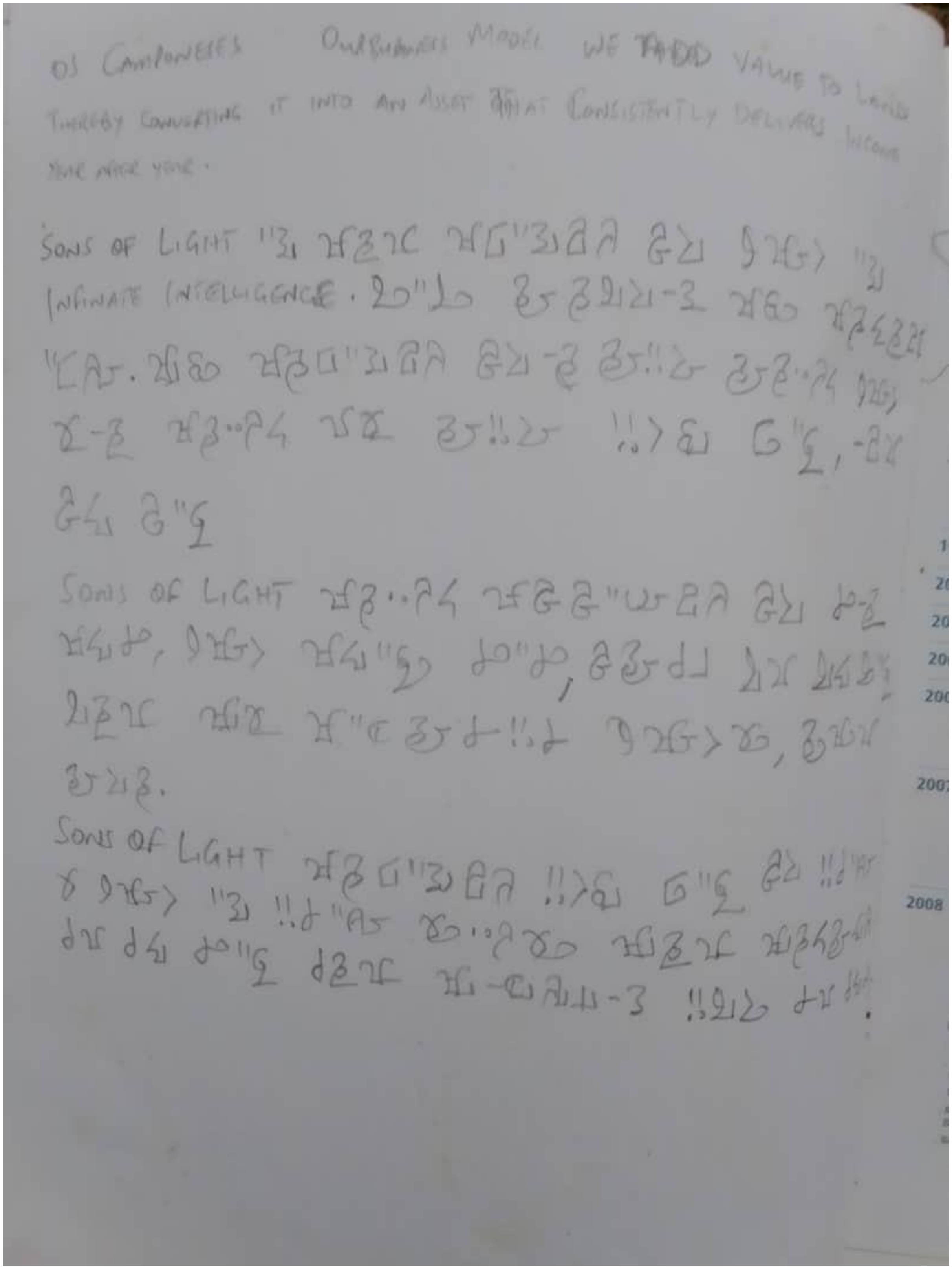


Figure 58. Chichewa-language handwriting by a Malawian user. This image showcases a few intralinear English phrases and words in the Latin script (important to typographers).

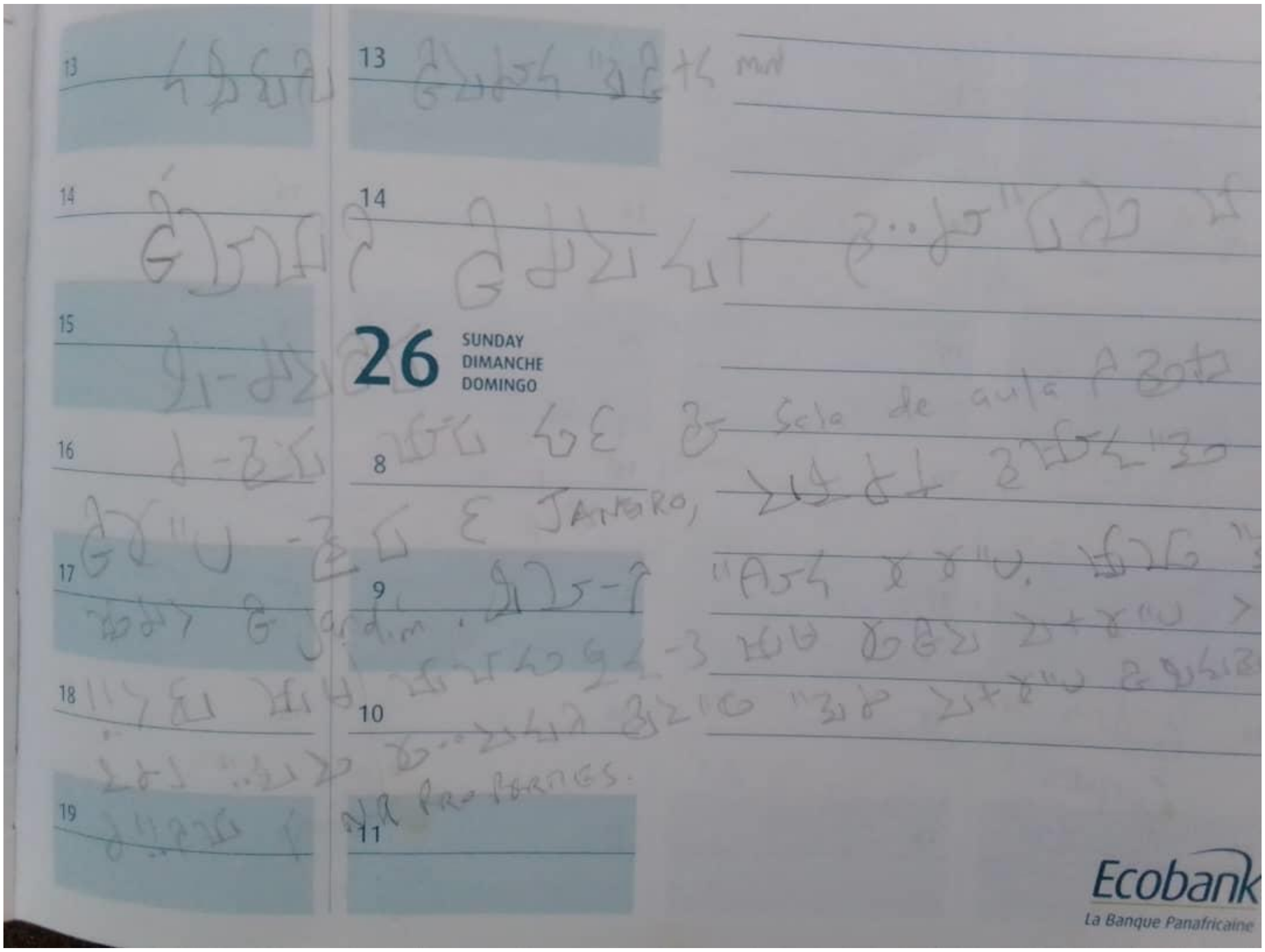

26
SUNDAY
DIMANCHE
DOMINGO
Sala de aula
JANEIRO,
jardim.
Ecobank
La Banque Panafricaine

Figure 59. Chichewa-language handwriting by a Malawian user. This image showcases a couple intralinear Portuguese words in the Latin script (important to typographers).

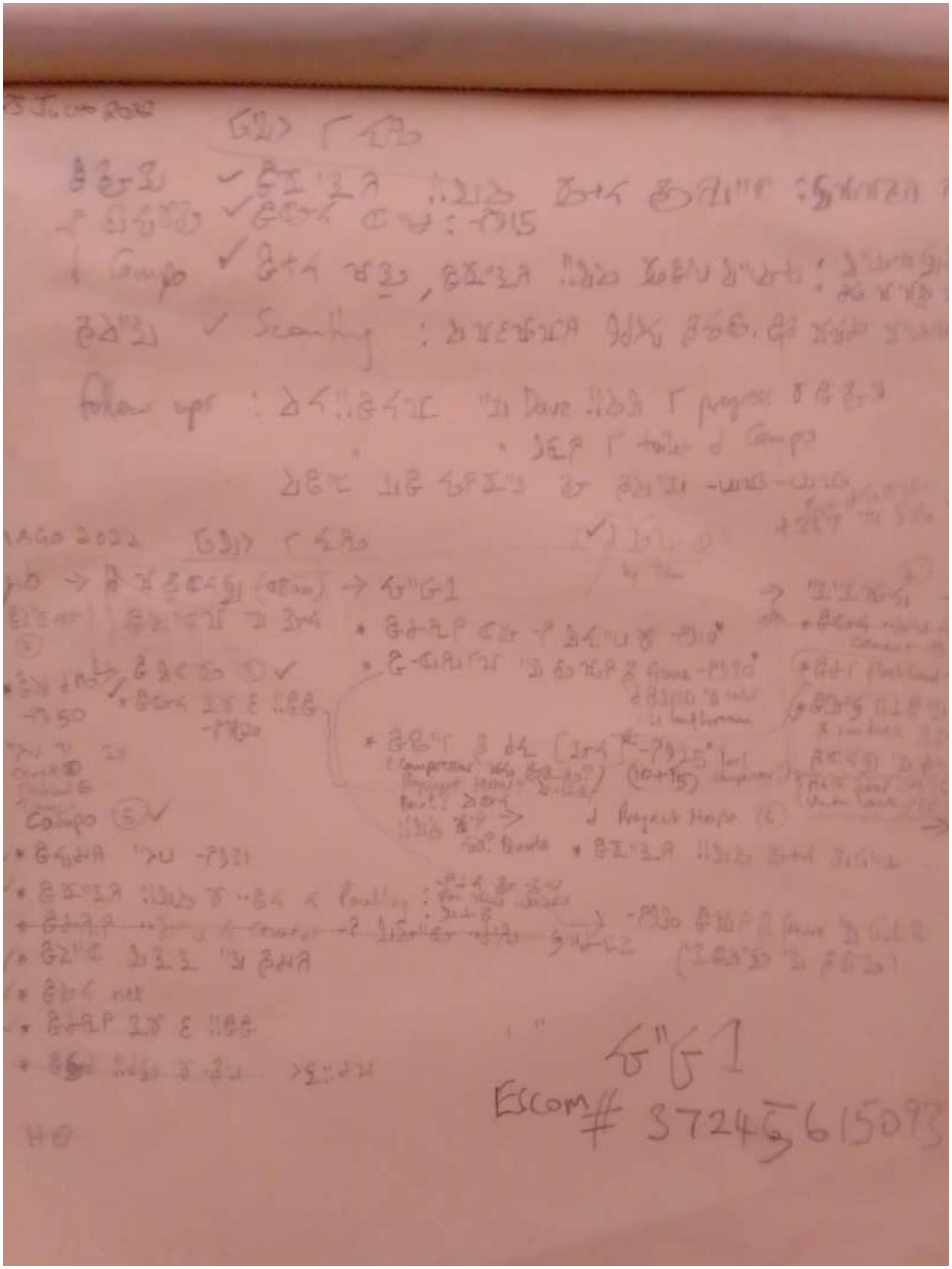


Figure 60. Chichewa-language handwriting by a Malawian user. This image showcases a couple intralinear English words in the Latin script (important to typographers).

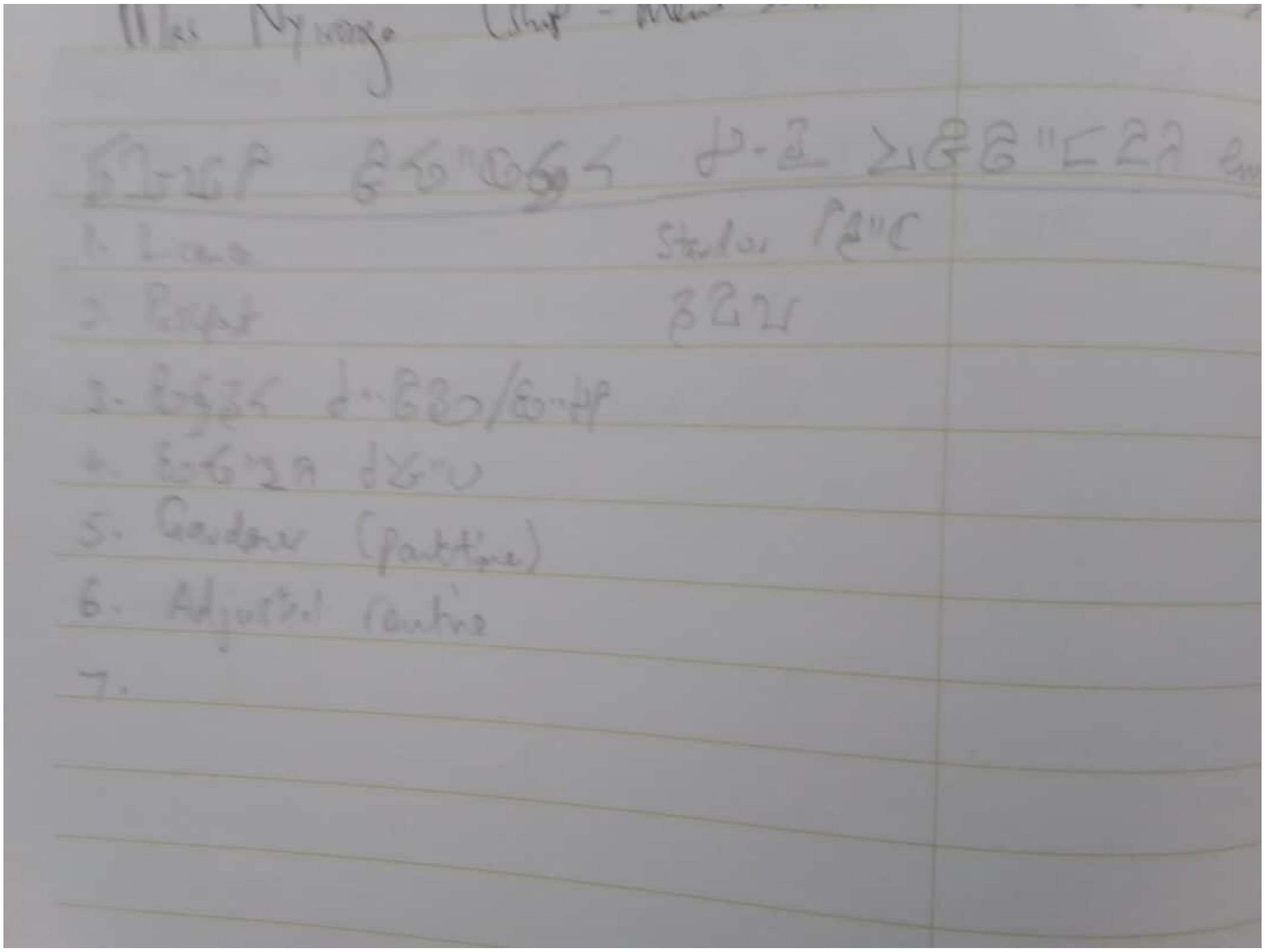


Figure 61. Chichewa-language handwriting by a Malawian user. This image showcases intralinear English in the Latin script (important to typographers).

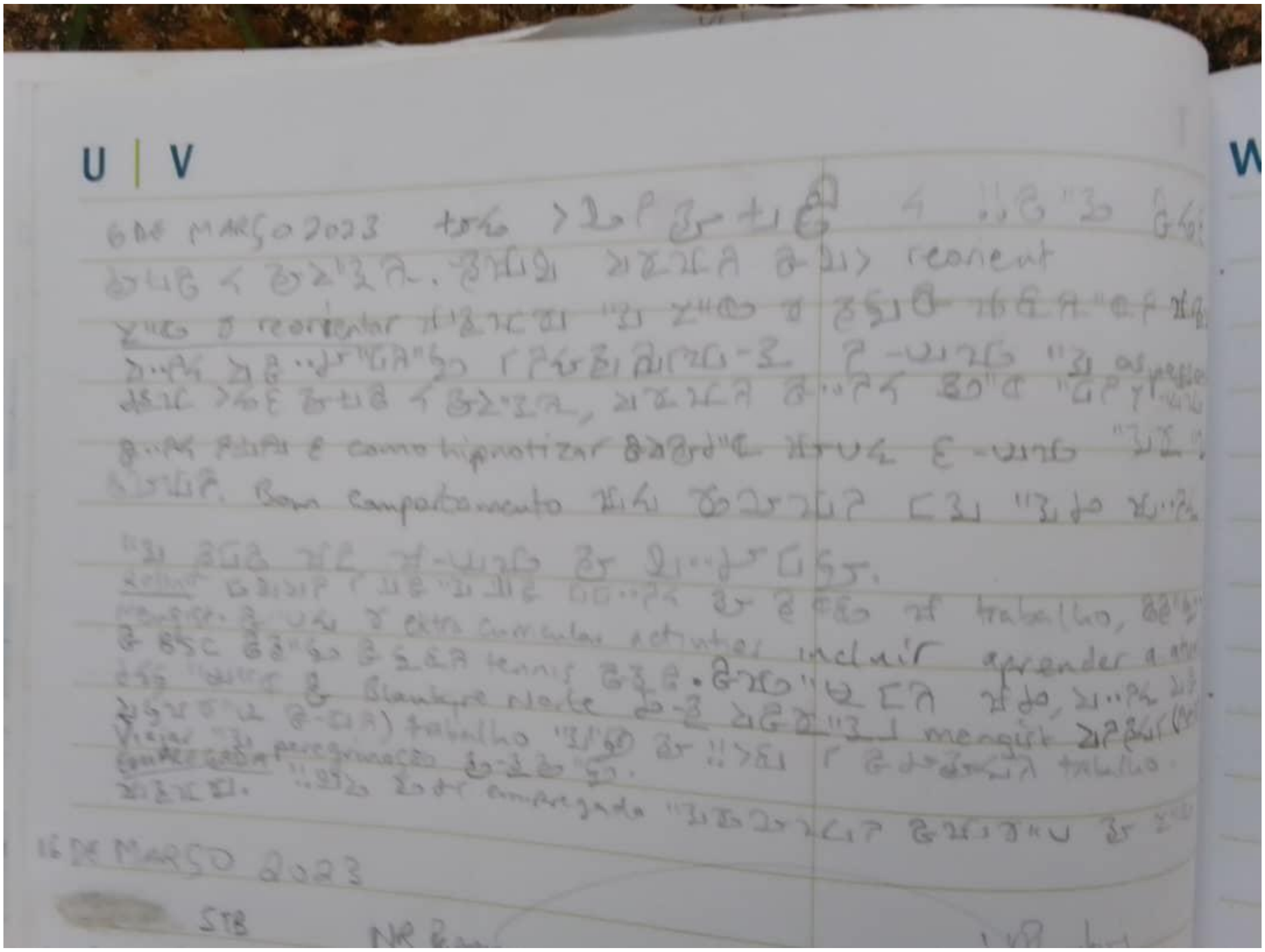


Figure 62. Chichewa-language handwriting by a Malawian user. These images showcases a couple intralinear Portuguese words in the Latin script (important to typographers).

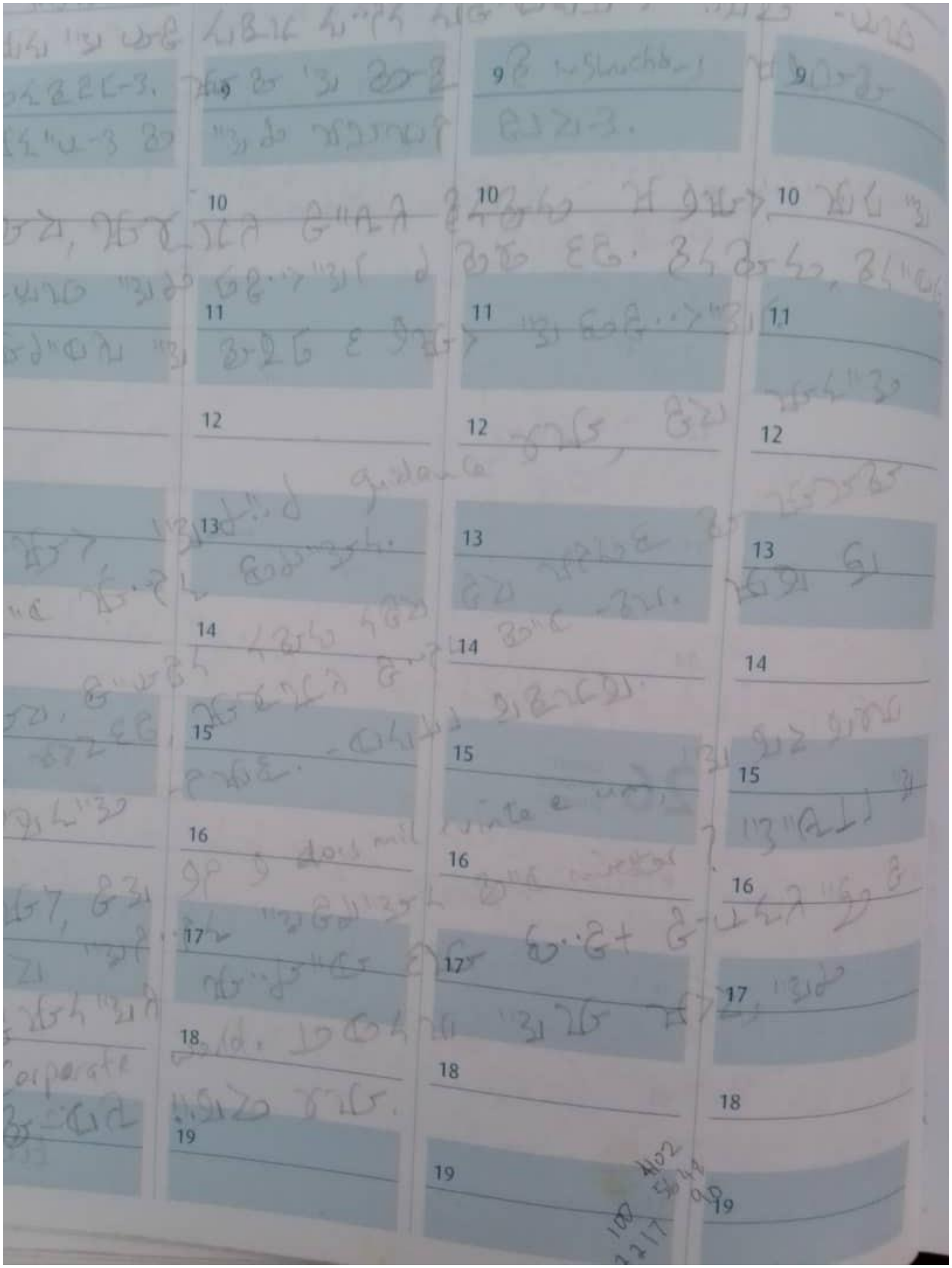


Figure 63. Chichewa-language handwriting by a Malawian user. This image showcases a couple intralinear Portuguese words in the Latin script (important to typographers).

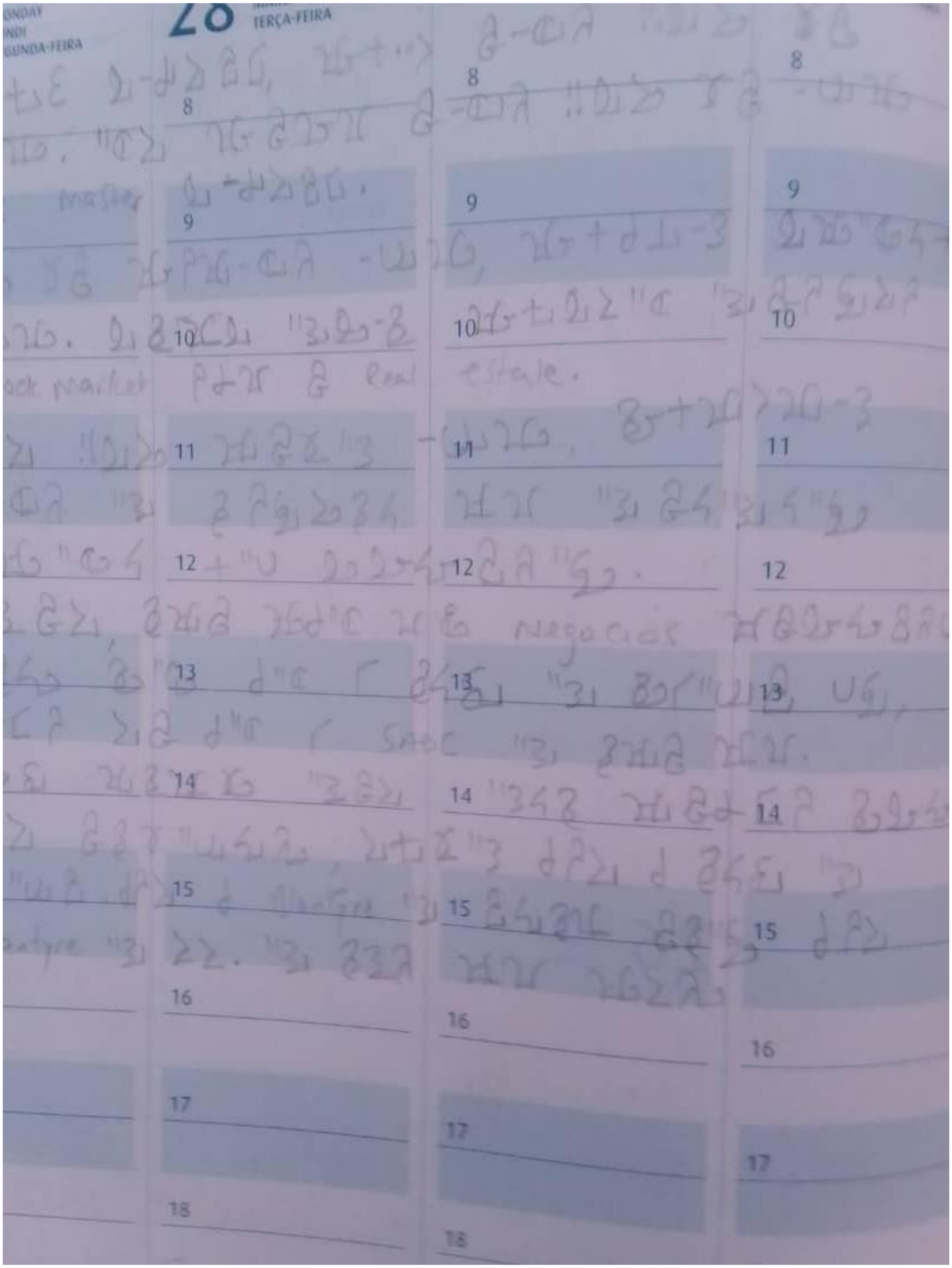

28
TERÇA-FEIRA
master
real estate.
negocios

Figure 64. Chichewa-language handwriting by a Malawian user. This image showcases a couple intralinear Portuguese words in the Latin script (important to typographers).

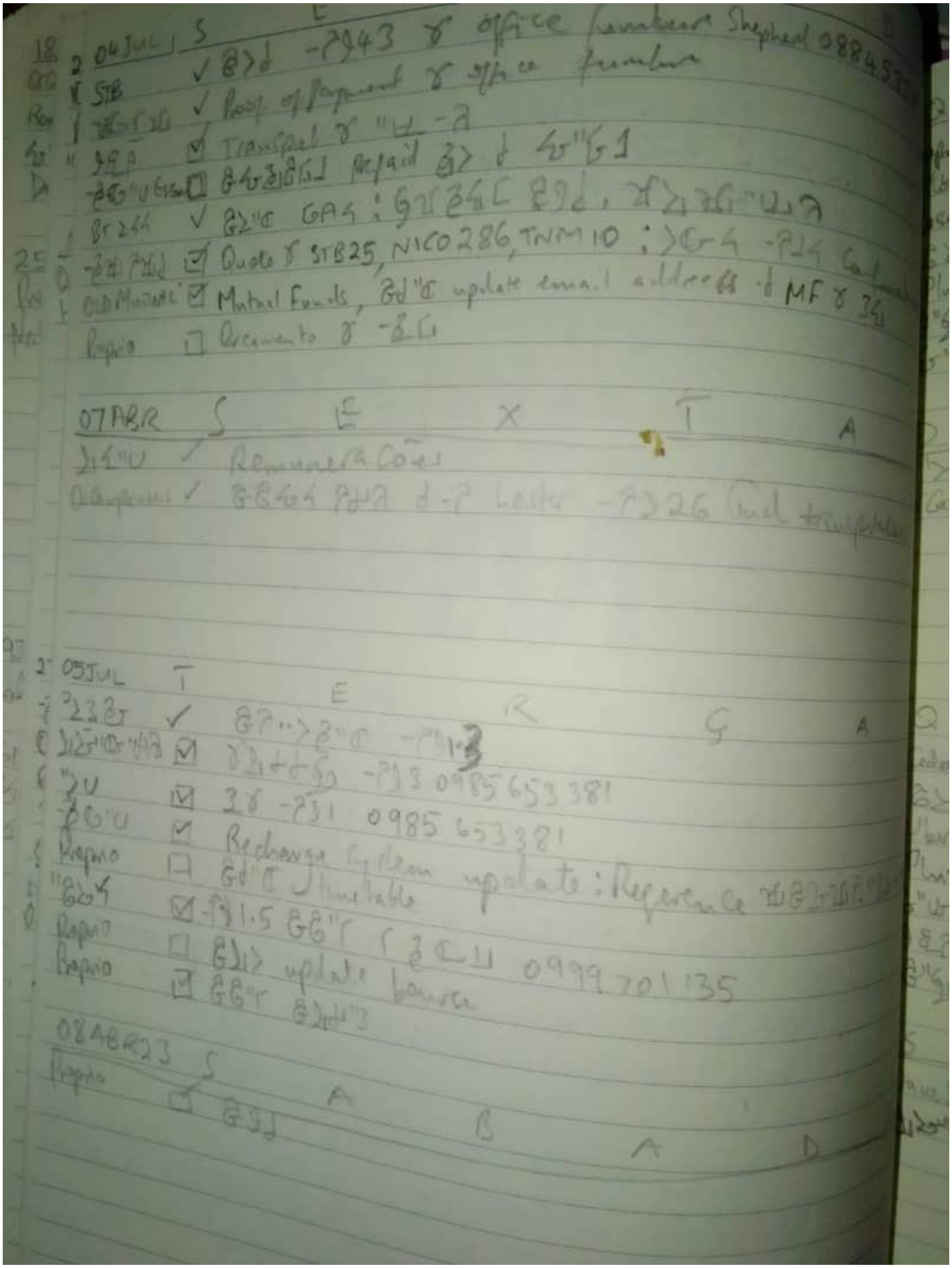


Figure 65. Chichewa-language handwriting by a Malawian user. This image showcases intralinear English words in the Latin script (important to typographers) as the user is a businessman that conducts international business in English.

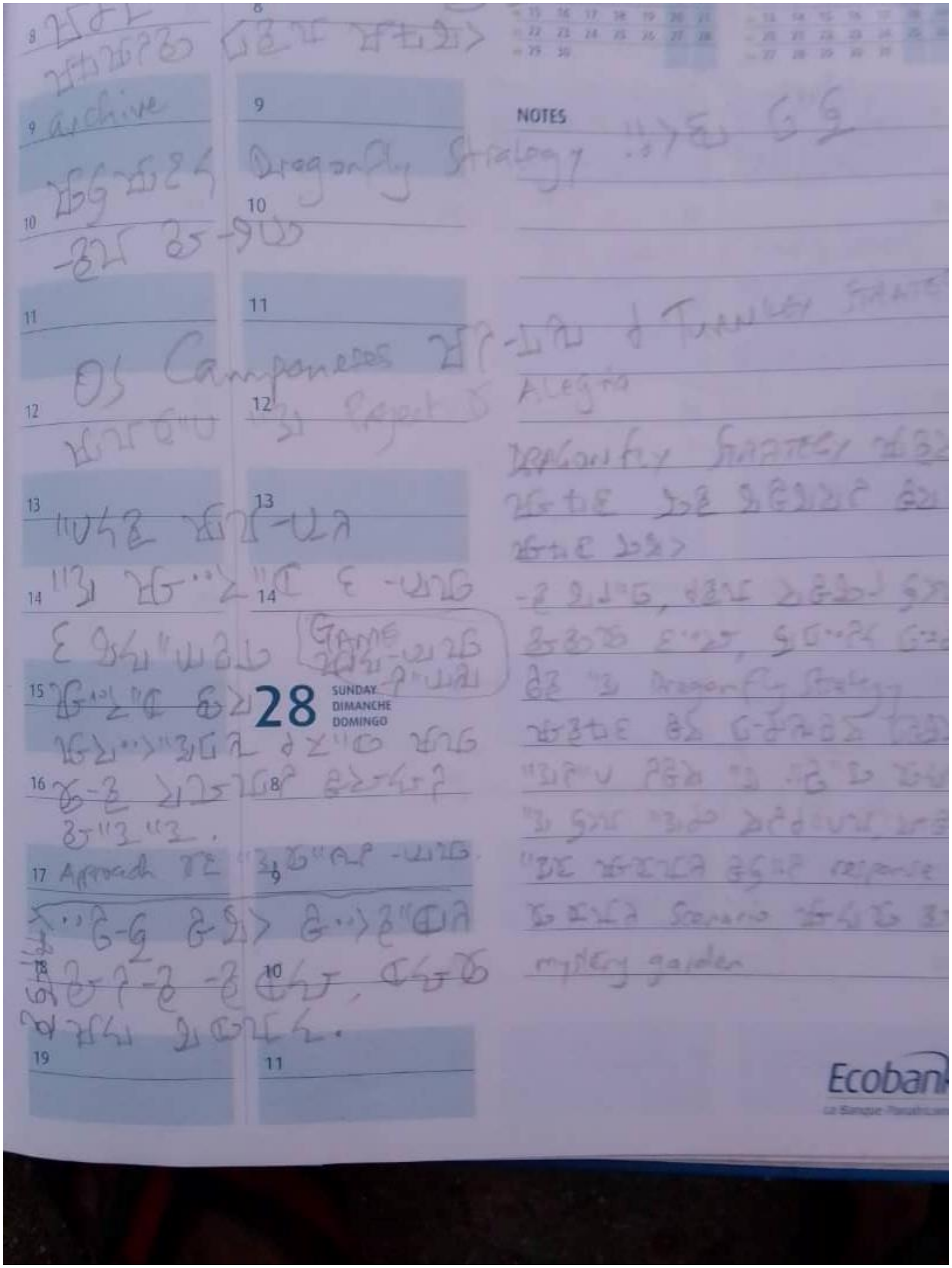
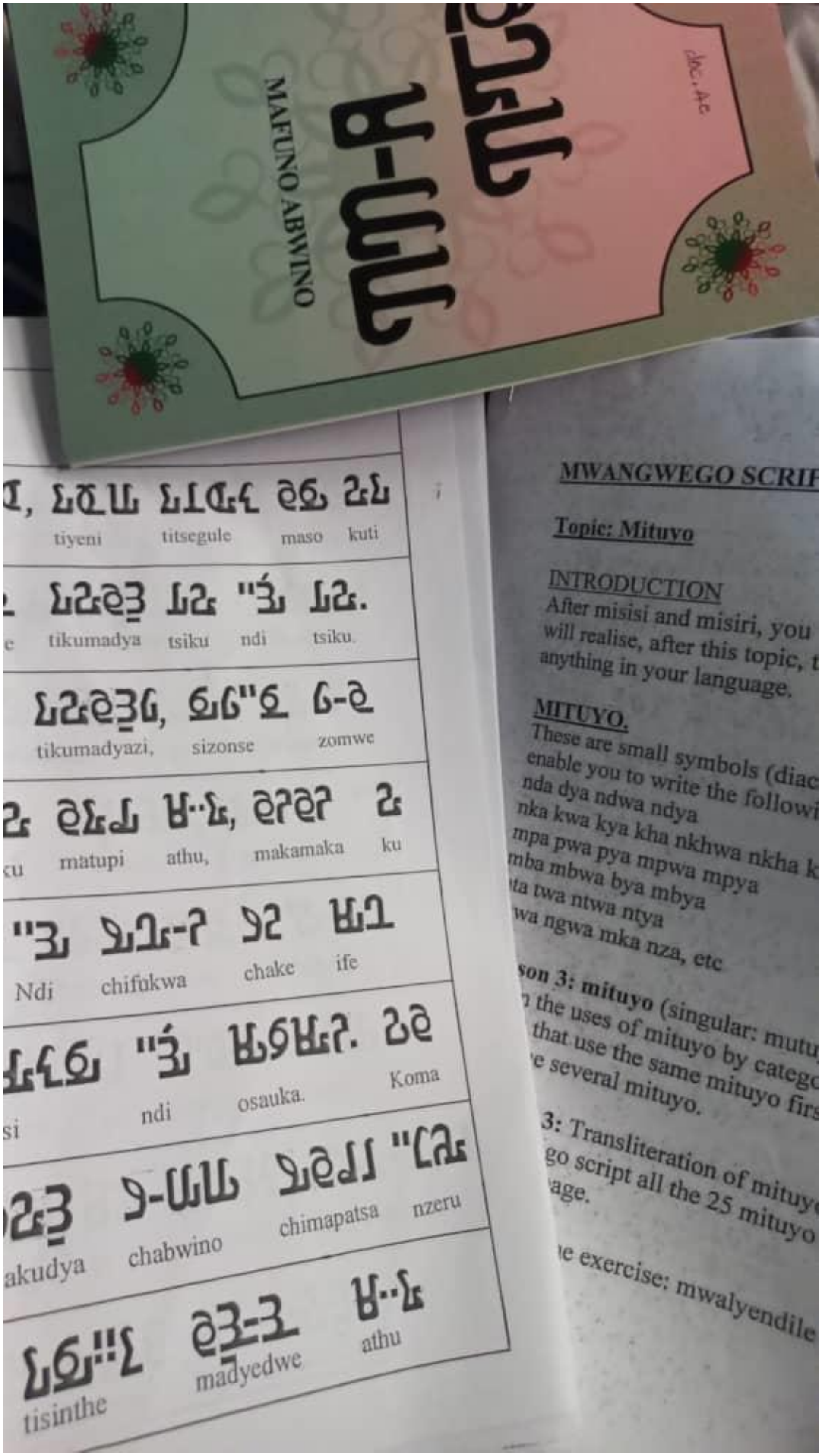

NOTES
archive
Dragonfly Strategy
Os Camponeses
Alegria
Dragonfly Strategy
GAME
28
SUNDAY
DIMANCHE
DOMINGO
Dragonfly Strategy
response
Approach
Scenario
mystery garden
Ecobank

Figure 66. Chichewa-language handwriting by a Malawian user. This image showcases a few intralinear English words in the Latin script (important to typographers).



MAFUNO ABWINO

tiyeni titsegule maso kuti

e tikumadya tsiku ndi tsiku.

tikumadyazi, sizonse zomwe

u matupi athu, makamaka ku

Ndi chifukwa chake ife

si ndi osauka. Koma

akudya chabwino chimapatsa nzeru

tisinthe madyedwe athu

MWANGWEGO SCRIF

Topic: Mituyo

INTRODUCTION

After misisi and misiri, you
will realise, after this topic, t
anything in your language.

MITUYO.

These are small symbols (diac
enable you to write the followi
nda dya ndwa ndya
nka kwa kya kha nkhwa nkha k
mpa pwa pya mpwa mpya
mba mbwa bya mbya
ta twa ntwa ntya
wa ngwa mka nza, etc

son 3: mituyo (singular: mutu
the uses of mituyo by catego
that use the same mituyo firs
e several mituyo.

3: Transliteration of mituyo
go script all the 25 mituyo
age.

e exercise: mwalyendile

Figure 67. Packages with educational materials are given to volunteer teachers to instruct students.

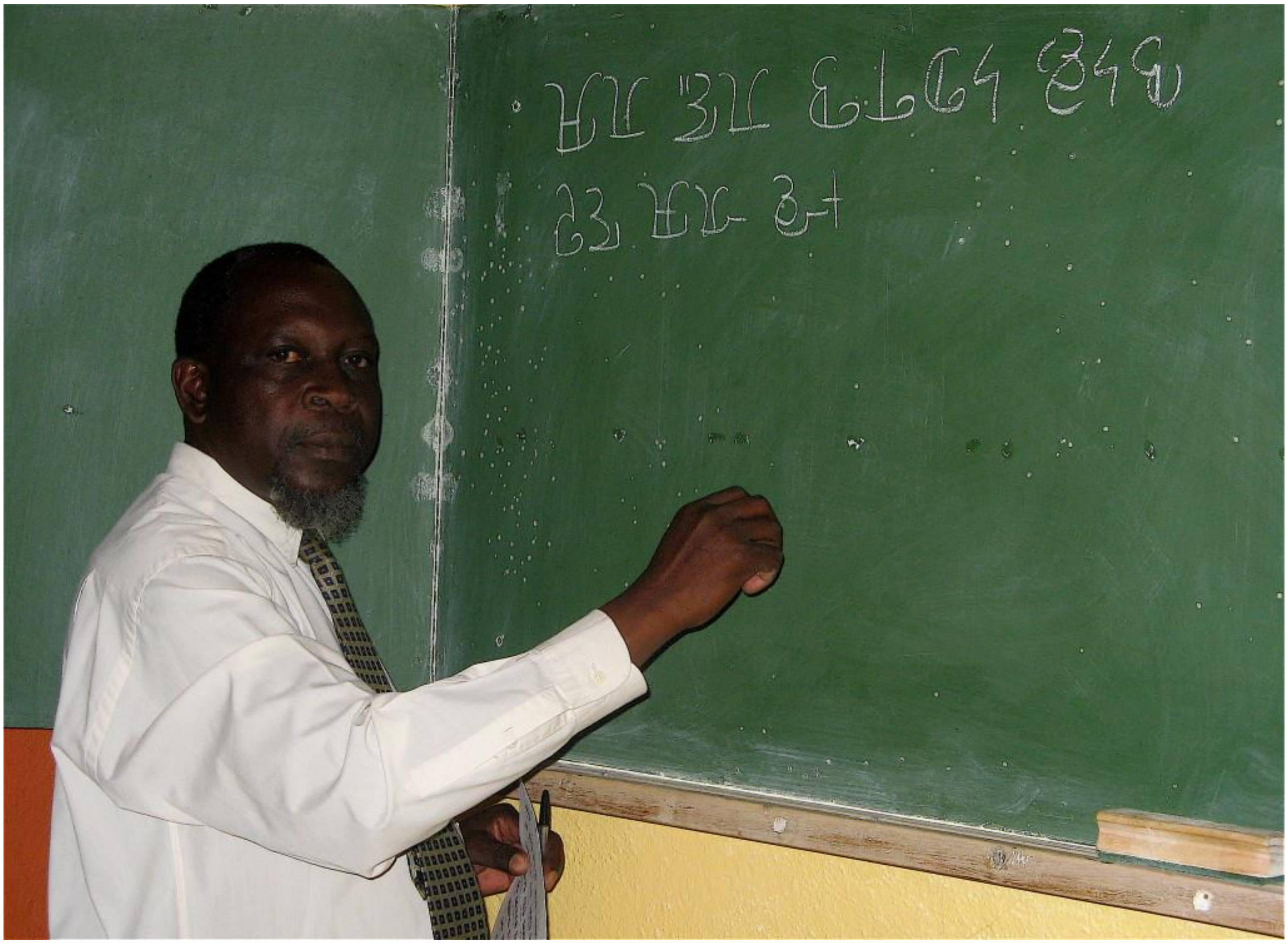


Figure 68. Nolence Mwangwego teaching a classroom the Mwangwego script sometime before late-2010.

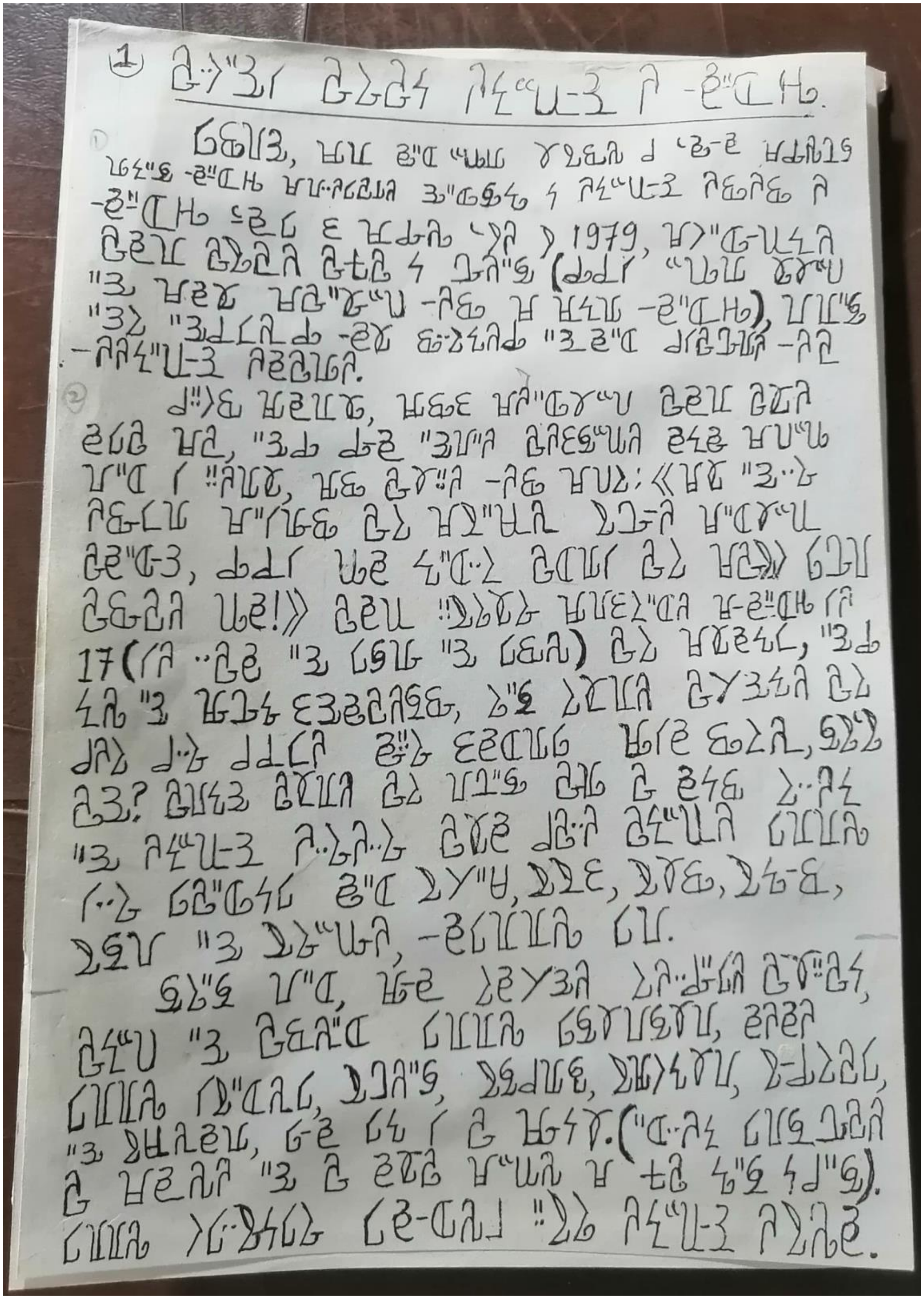


Figure 69. A letter.

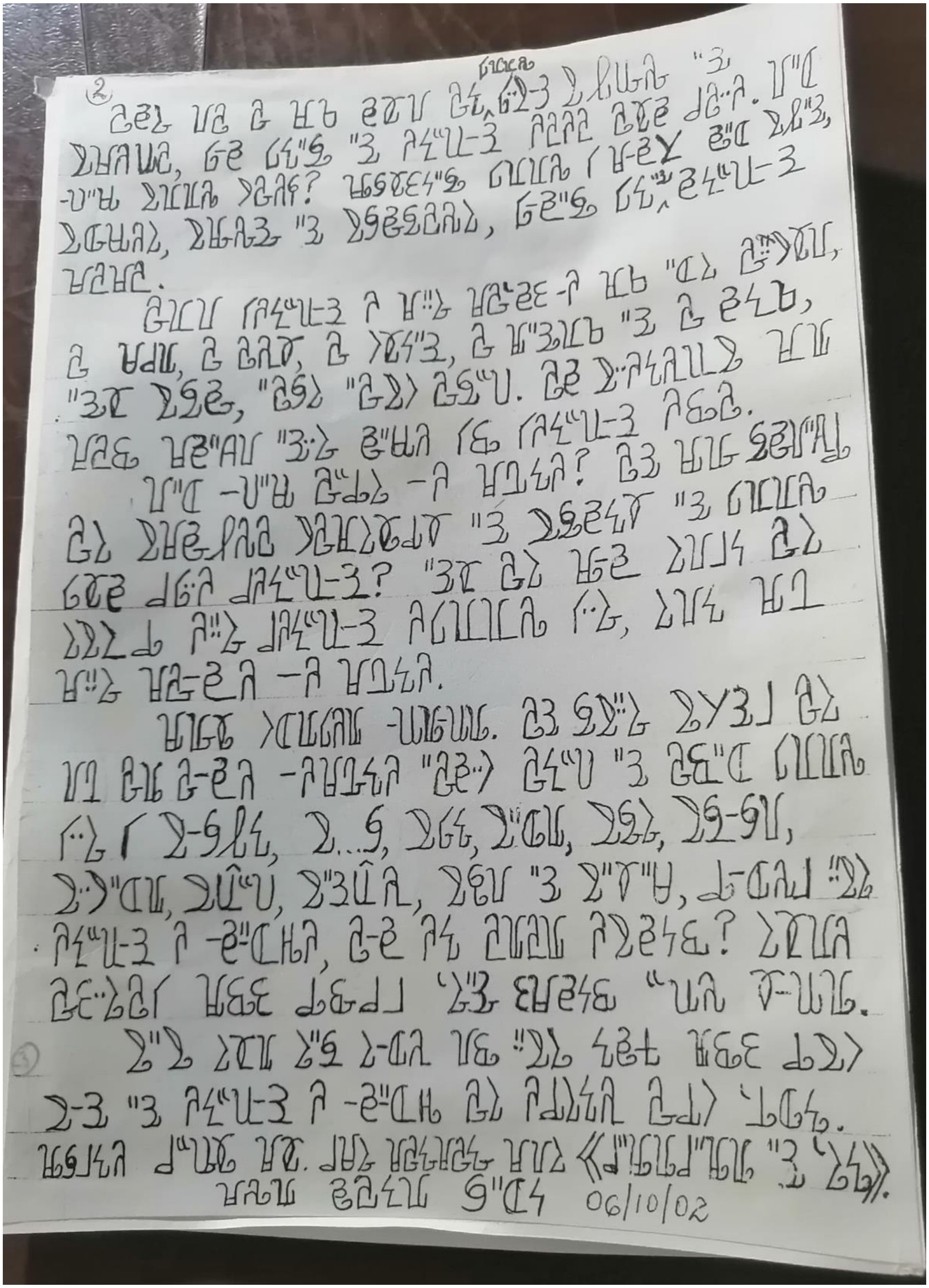


Figure 70. A letter.

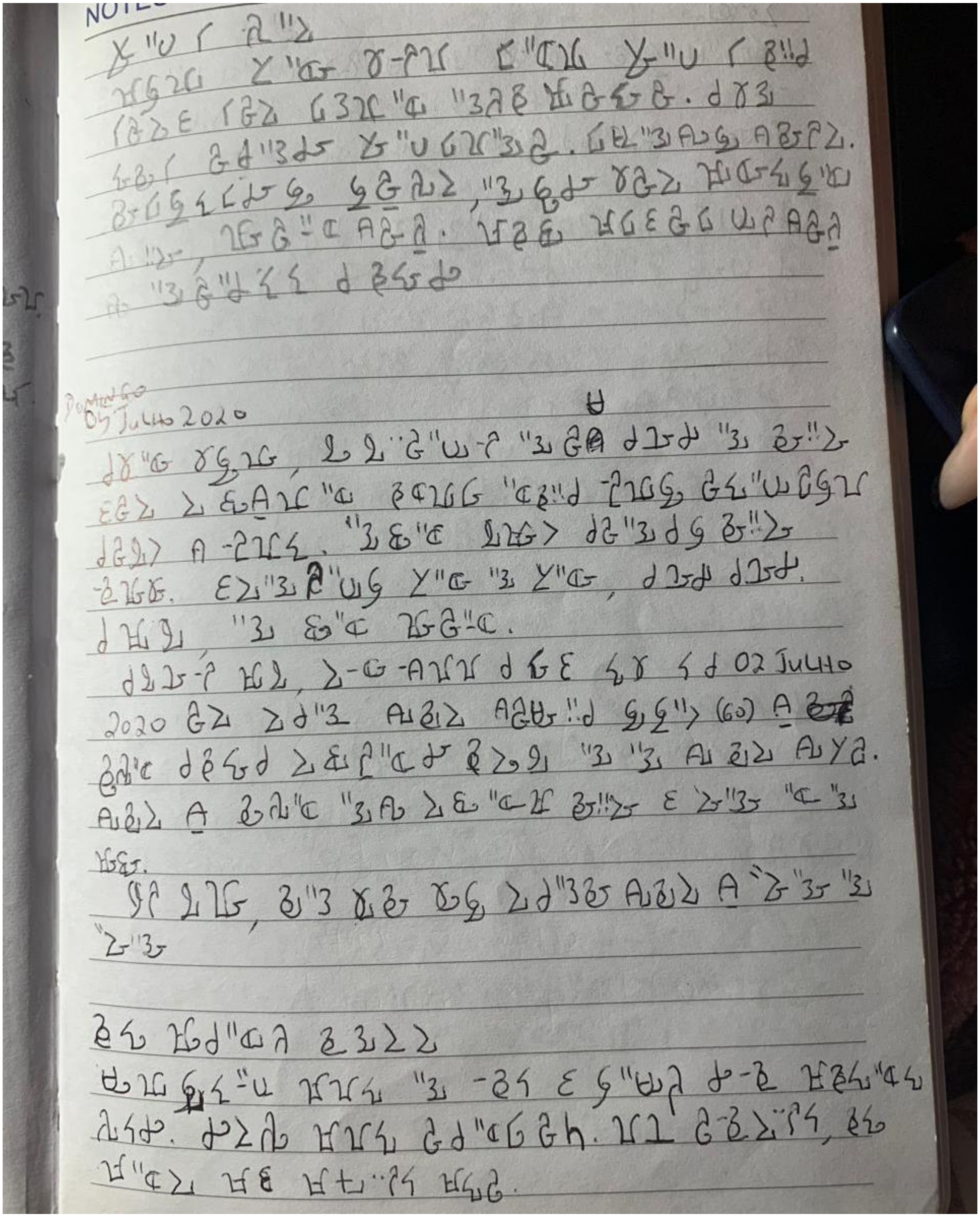
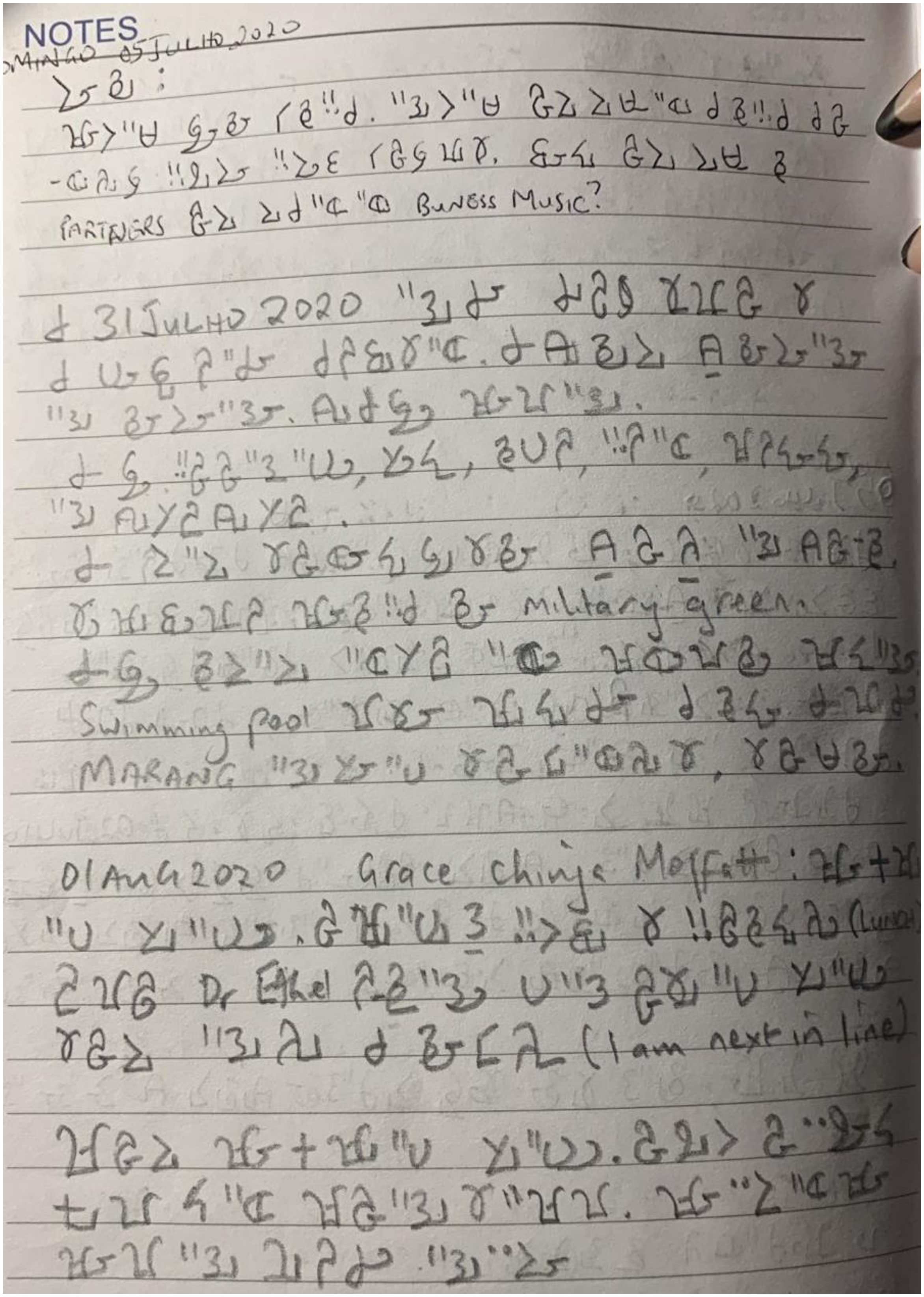


Figure 71. Page from a very long diary that was mailed from the author to other user(s) for interpersonal communication/text interchange. Figures 71-110 are part of this large text.



NOTES

DOMINGO 05 JULHO 2020

[illegible]

[illegible] Buness Music?

PARTNERS [illegible]

[illegible] 31 JULHO 2020 [illegible]

[illegible] military green.

[illegible]

Swimming pool [illegible]

MARANG [illegible]

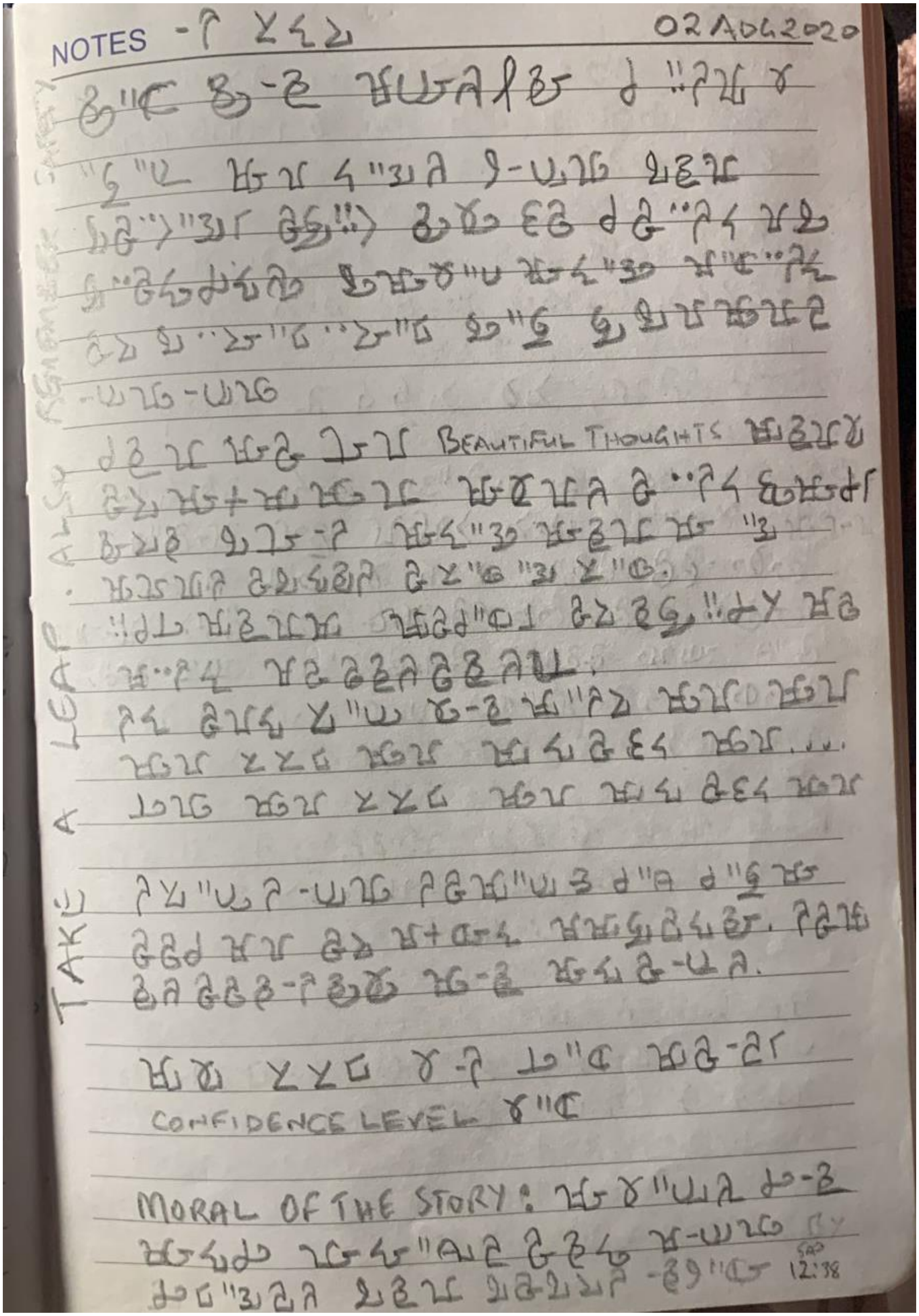
01 AUG 2020 Grace Chinje Moffatt: [illegible] (Lunch)

[illegible] Dr Ethel [illegible]

[illegible] (I am next in line)

[illegible]

Figure 72.



NOTES

02 AUG 2020

TAKE A LEAP. ALSO REMEMBER SAFETY

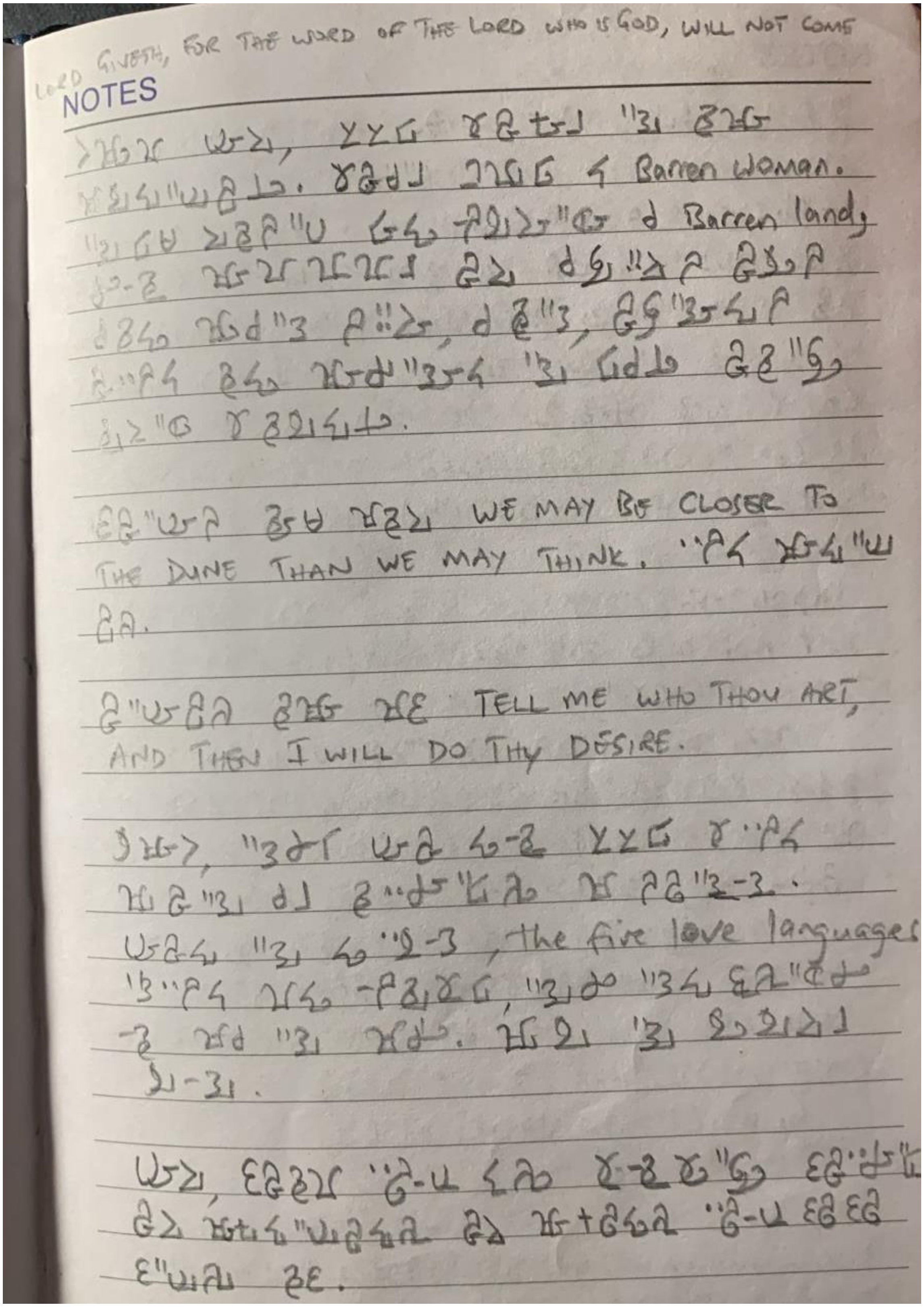
BEAUTIFUL THOUGHTS

CONFIDENCE LEVEL

MORAL OF THE STORY:

SAD 12:38

Figure 73.



LORD GIVETH, FOR THE WORD OF THE LORD WHO IS GOD, WILL NOT COME

NOTES

Barren woman.

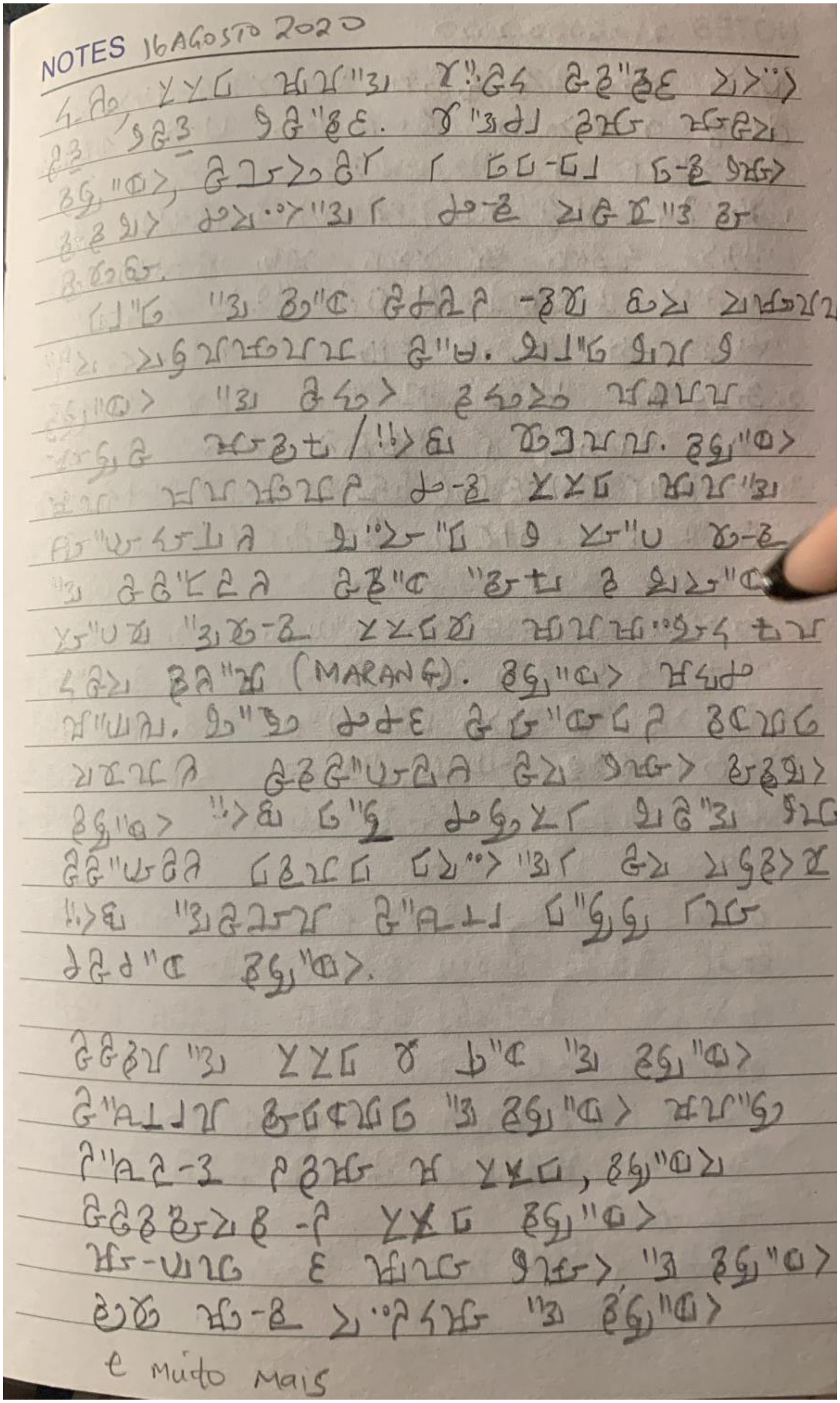
Barren land,

WE MAY BE CLOSER TO THE DUNE THAN WE MAY THINK.

TELL ME WHO THOU ART, AND THEN I WILL DO THY DESIRE.

the five love languages

Figure 74.



NOTES 16 AGOSTO 2020

(MARANG).

e muito mais

Figure 75.

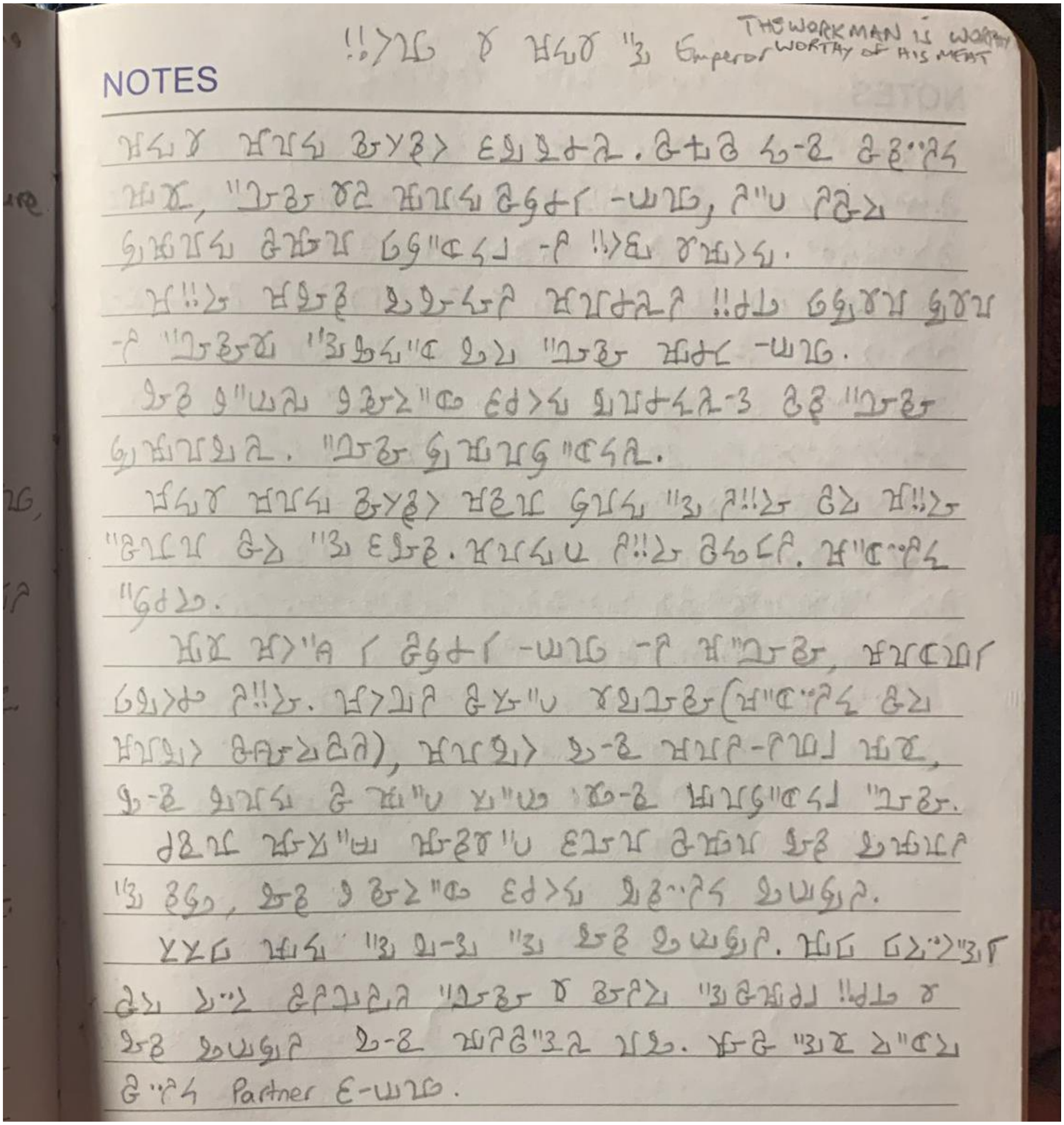
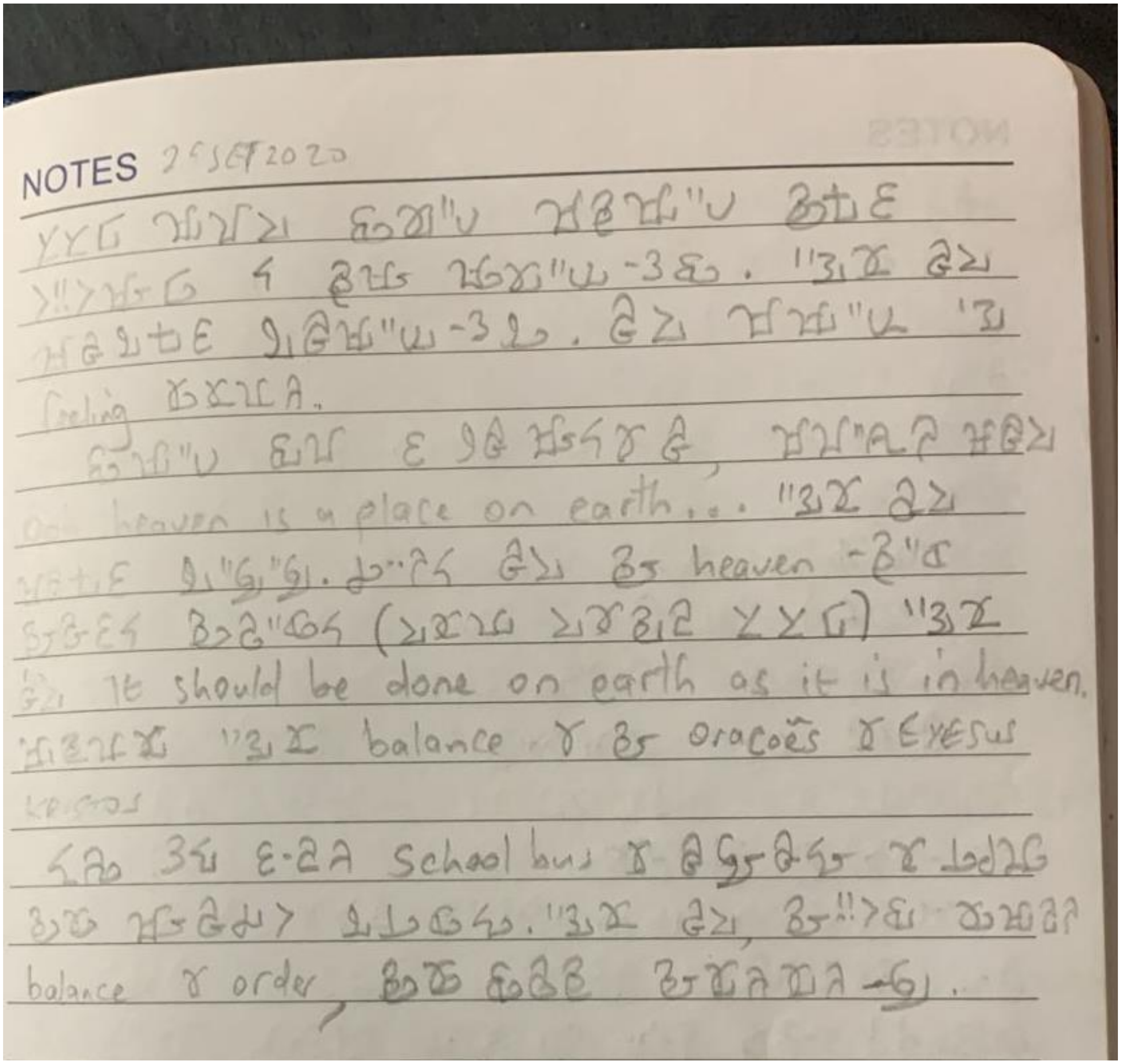

NOTES
Emperor
THE WORKMAN is WORTHY
WORTHY OF HIS MEAT
Partner

Figure 76.



NOTES 25 SEP 2020

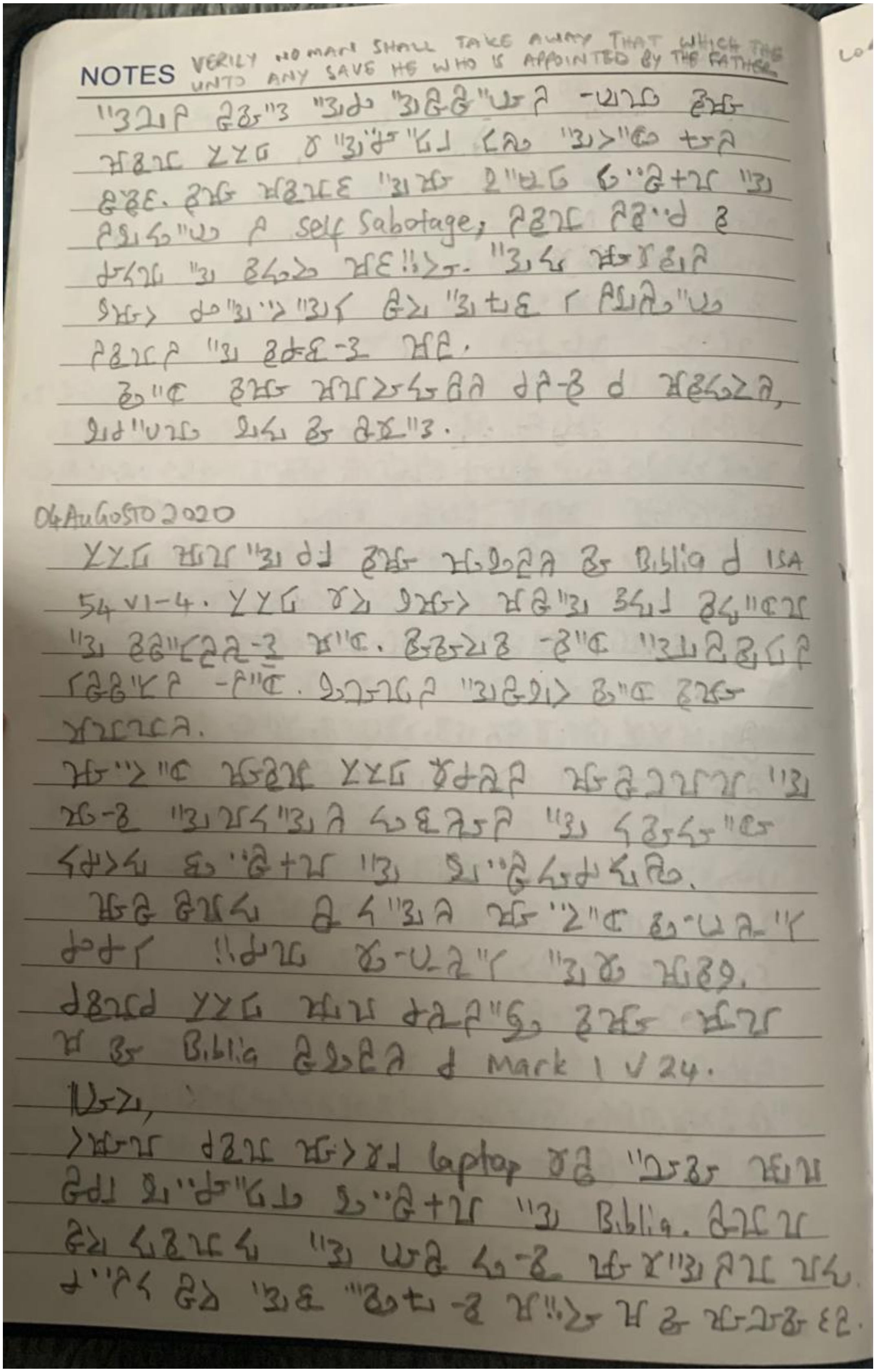
[illegible]

[illegible] feeling [illegible].

[illegible] heaven is a place on earth... [illegible] heaven [illegible] It should be done on earth as it is in heaven. [illegible] balance [illegible] oracoes [illegible] YESUS KRISTOS

[illegible] school bus [illegible] balance [illegible] order, [illegible].

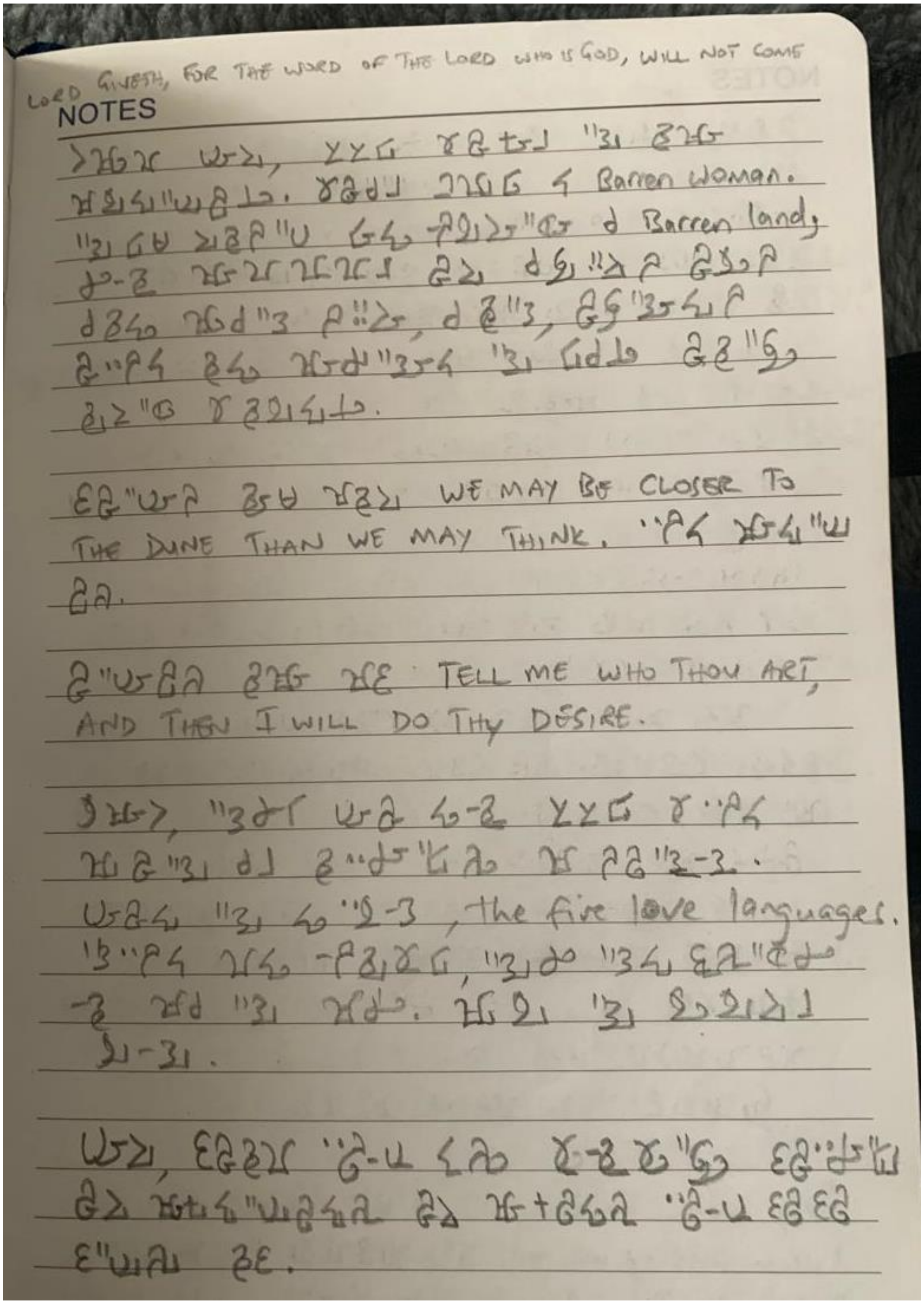
Figure 77.



NOTES VERILY NO MAN SHALL TAKE AWAY THAT WHICH THE UNTO ANY SAVE HE WHO IS APPOINTED BY THE FATHER

04 AUGOSTO 2020

Figure 78.



LORD GIVETH, FOR THE WORD OF THE LORD WHO IS GOD, WILL NOT COME

NOTES

[illegible] a Barren woman. [illegible] a Barren land, [illegible]

[illegible] WE MAY BE CLOSER TO THE DUNE THAN WE MAY THINK. [illegible]

[illegible] TELL ME WHO THOU ART, AND THEN I WILL DO THY DESIRE.

[illegible] the five love languages. [illegible]

[illegible]

Figure 79.

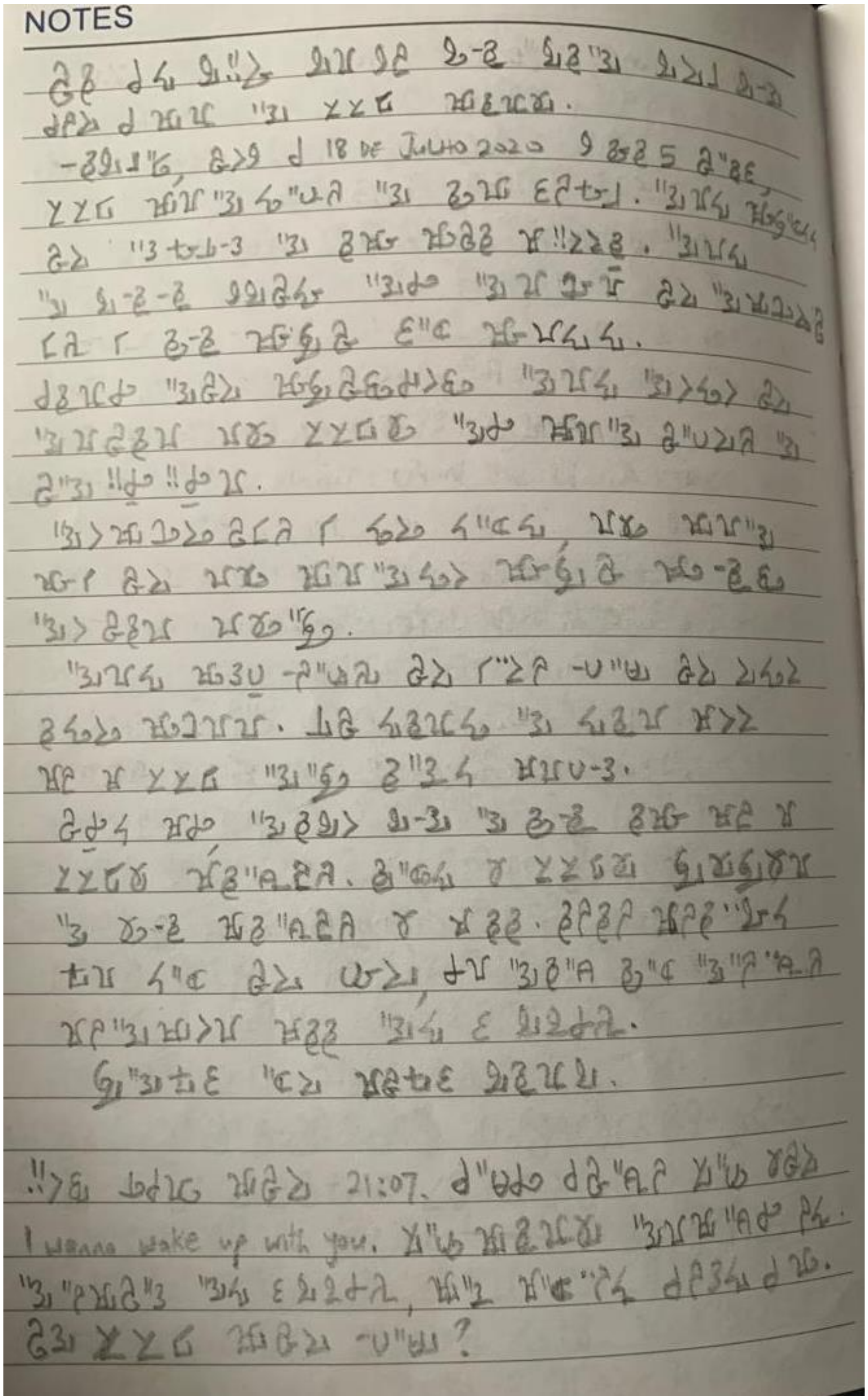
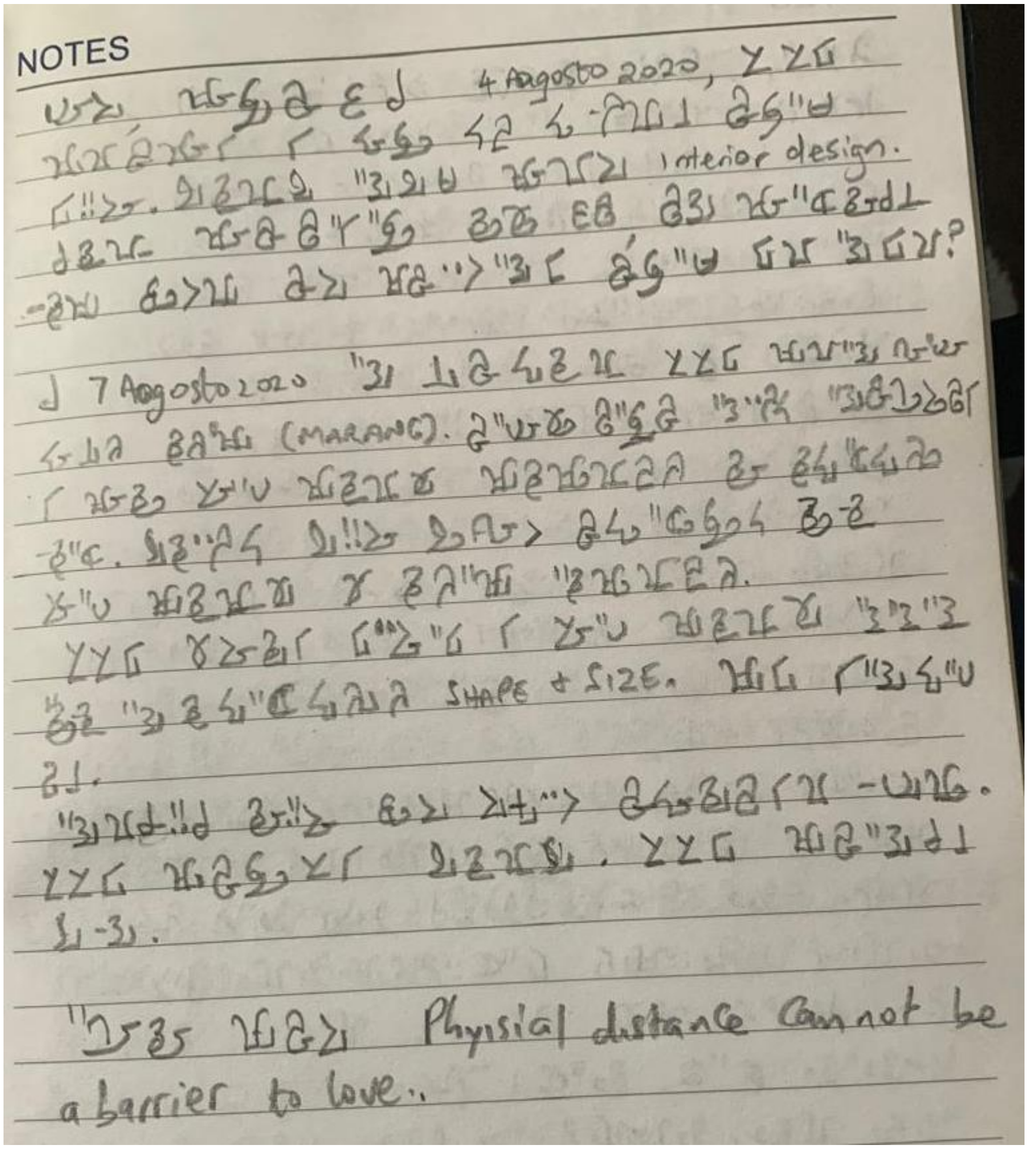

NOTES
18 DE JULHO 2020
21:07
I wanna wake up with you.

Figure 80.



NOTES

[illegible] 4 Agosto 2020, [illegible]

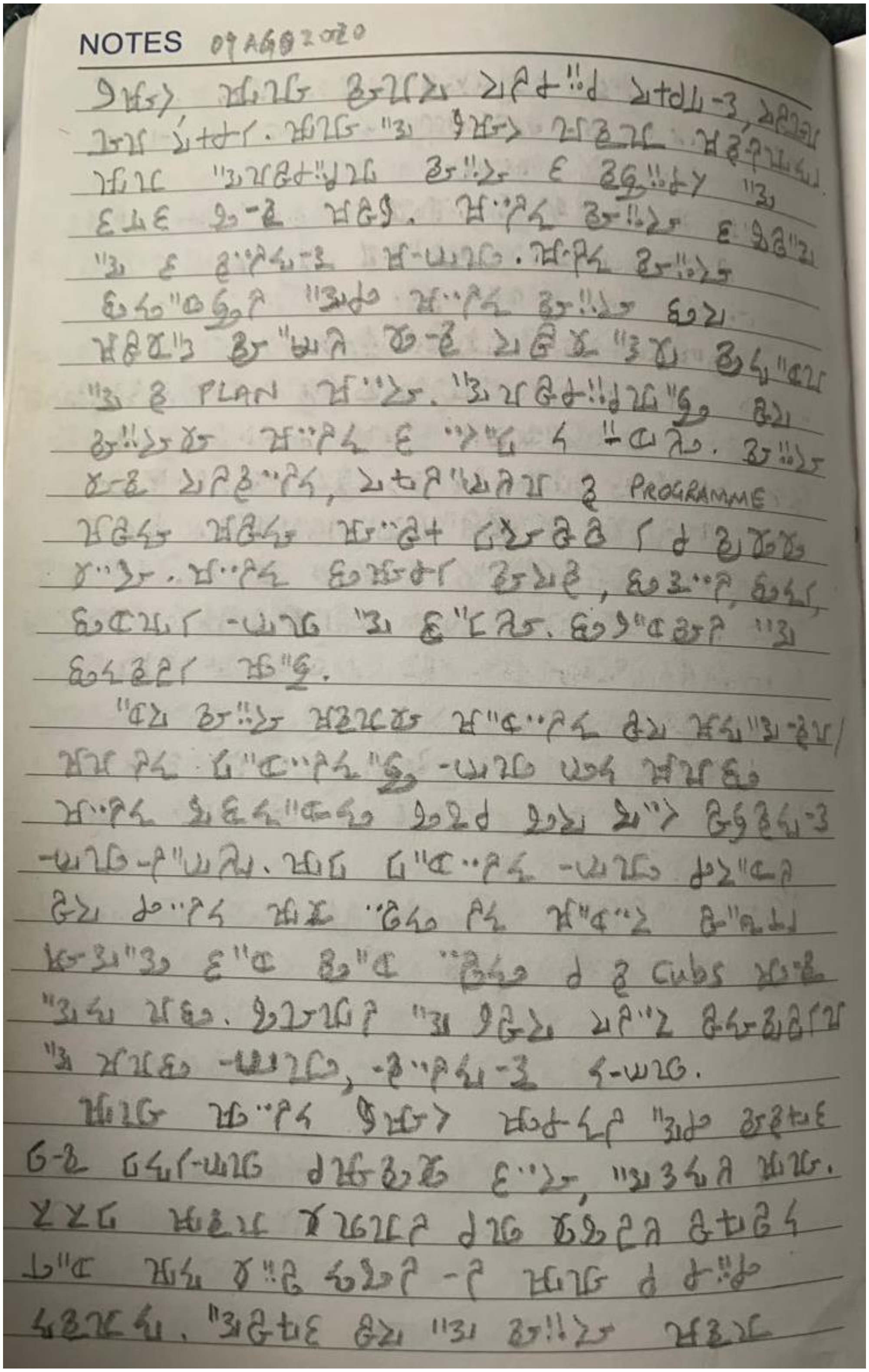
[illegible] interior design. [illegible]

[illegible] 7 Agosto 2020 [illegible] (MARANG). [illegible]

[illegible] SHAPE + SIZE. [illegible]

[illegible] Physisial distance Cannot be a barrier to love..

Figure 81.



NOTES 09AGO2020

Figure 82.

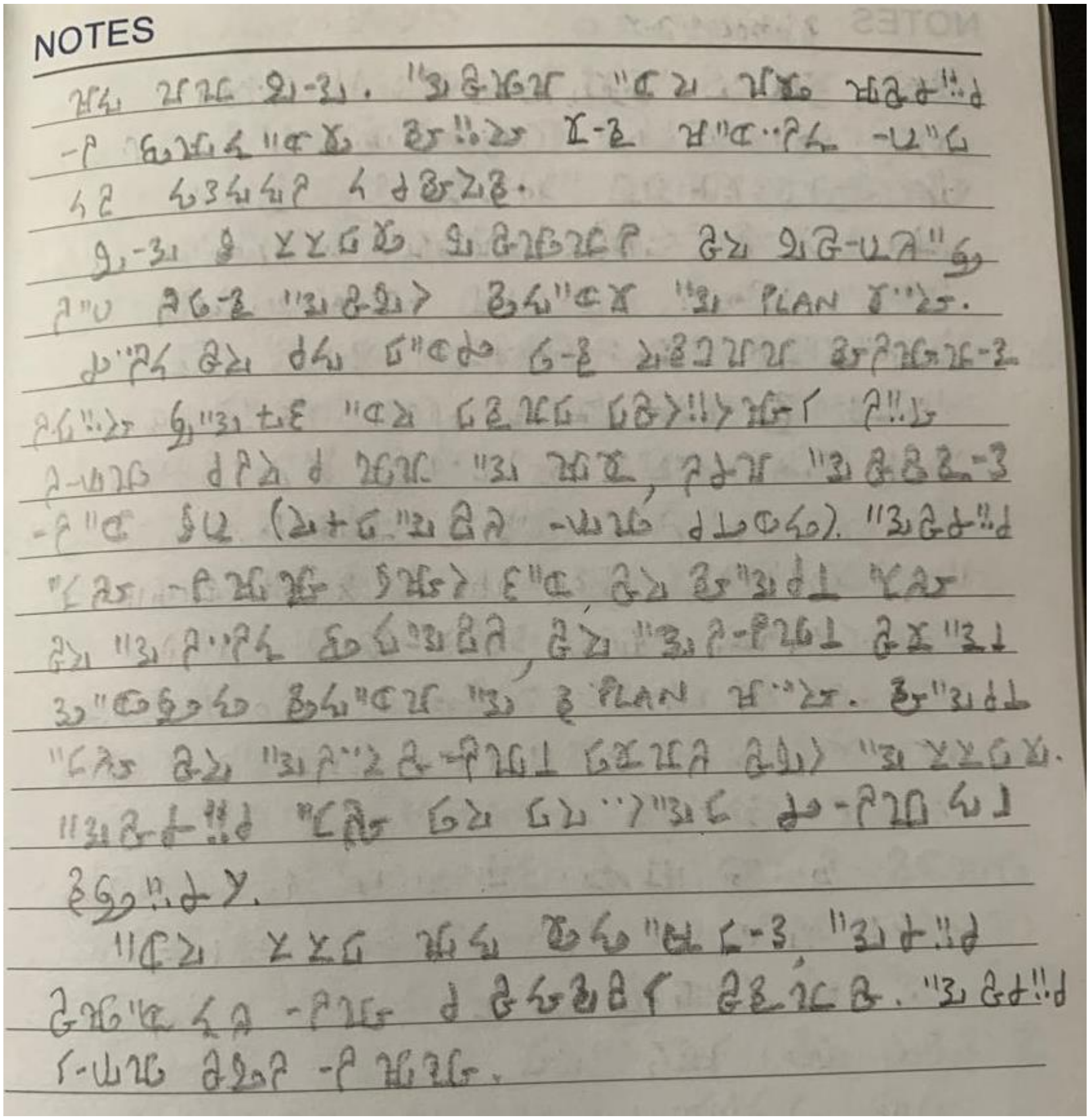
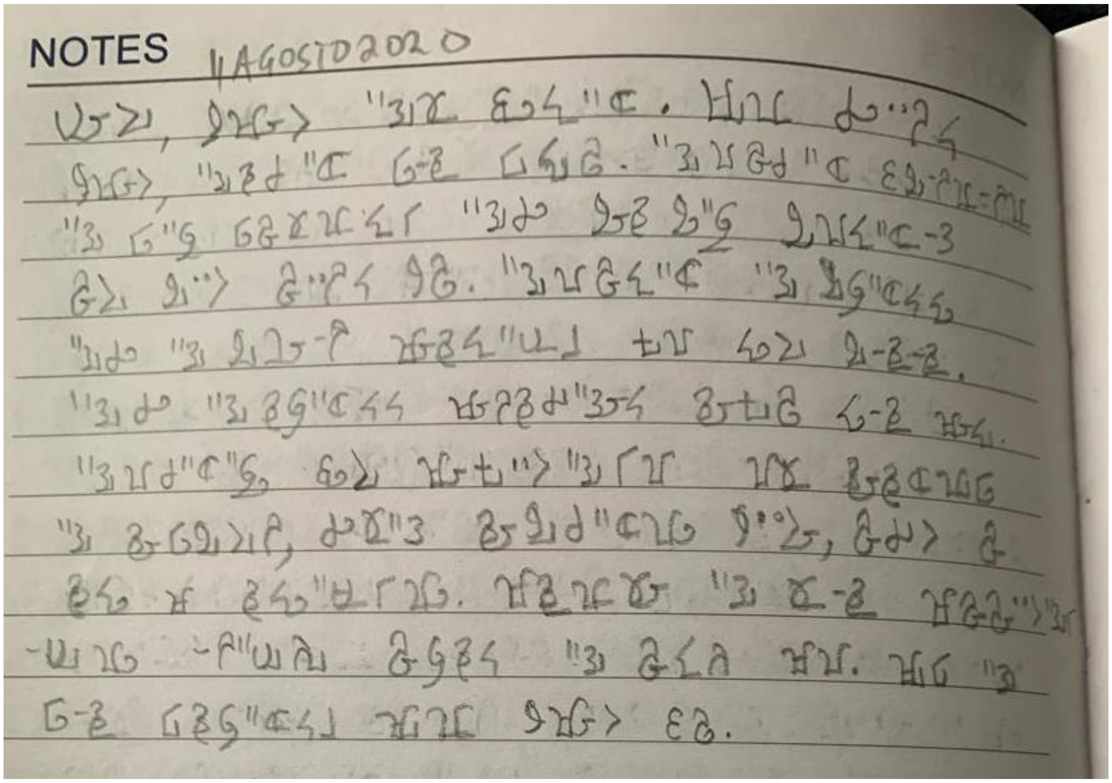
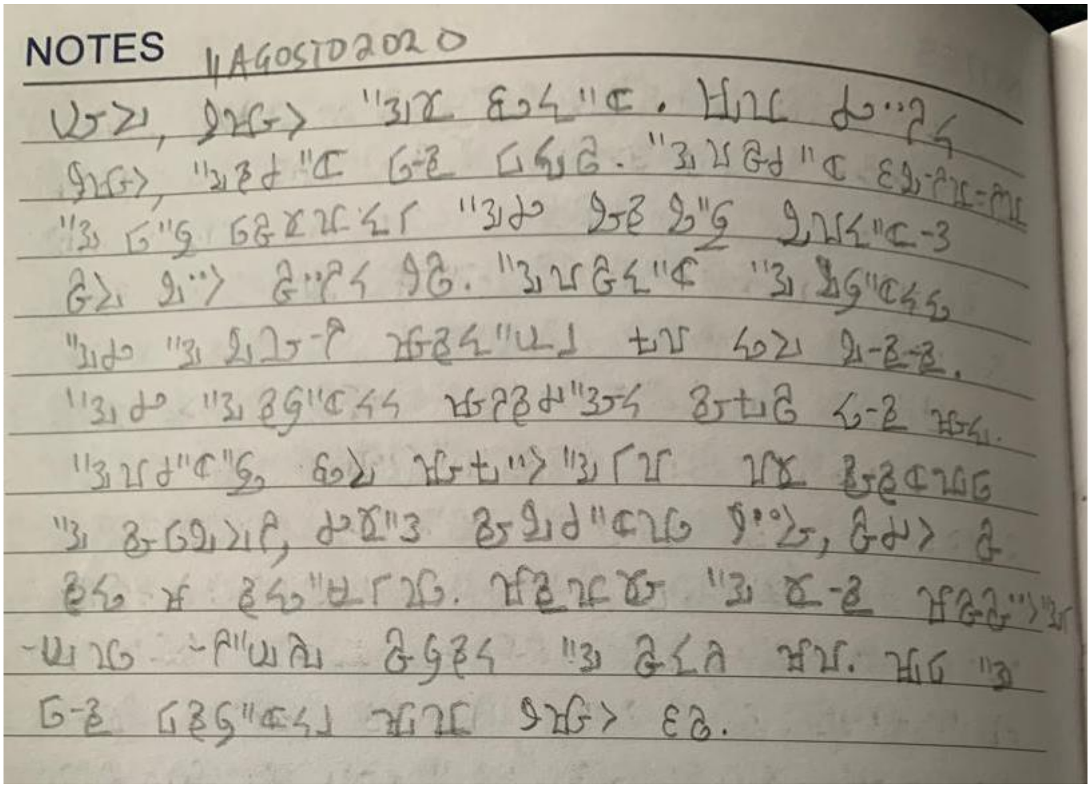

NOTES
PLAN
PLAN

Figure 83.



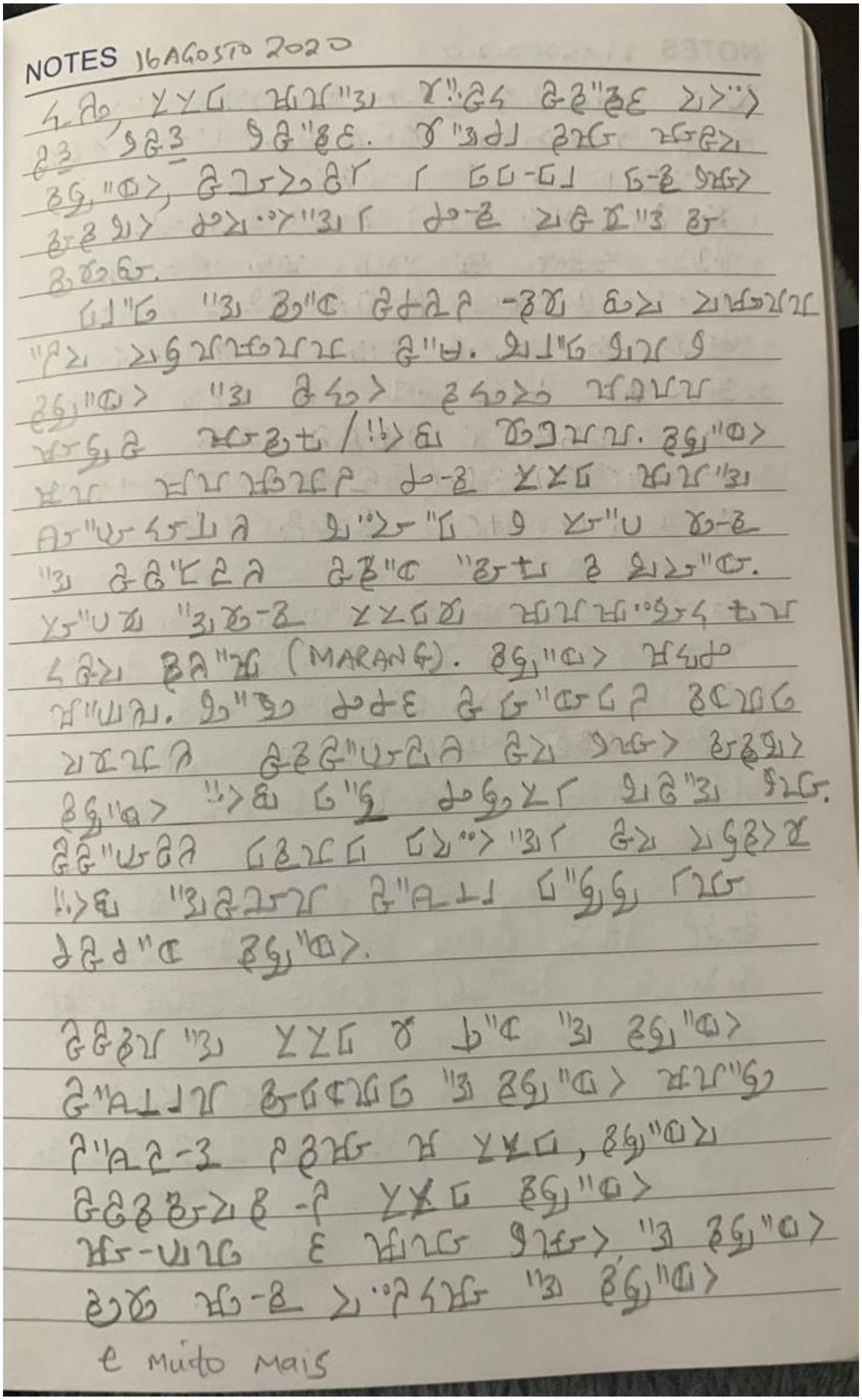
NOTES 11 AGOSTO 2020

Figure 84.



NOTES 11 AGOSTO 2020

Figure 85.

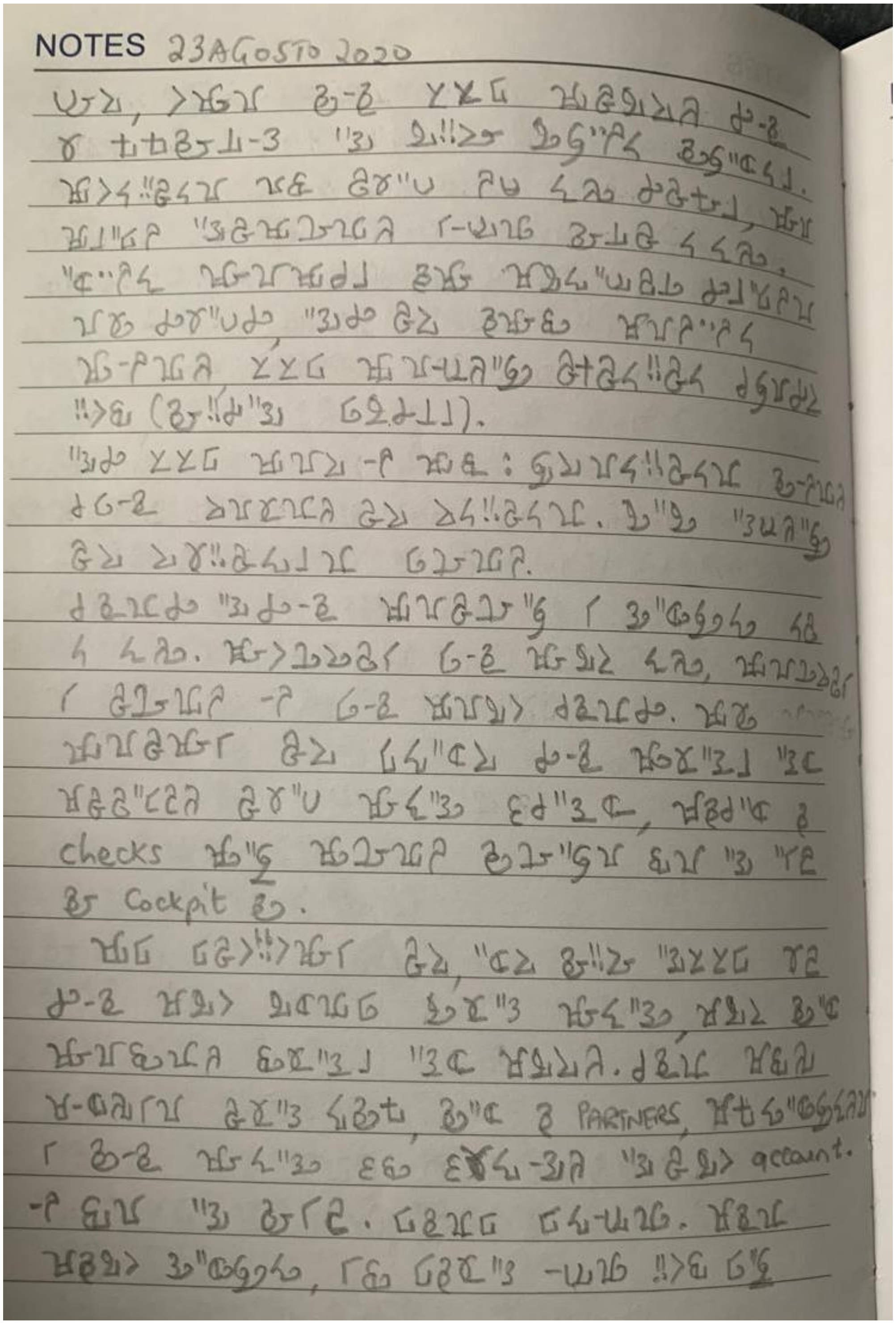


NOTES 16 AGOSTO 2020

(MARANG)

e muito mais

Figure 86.



NOTES 23AGOSTO 2020

Figure 87.

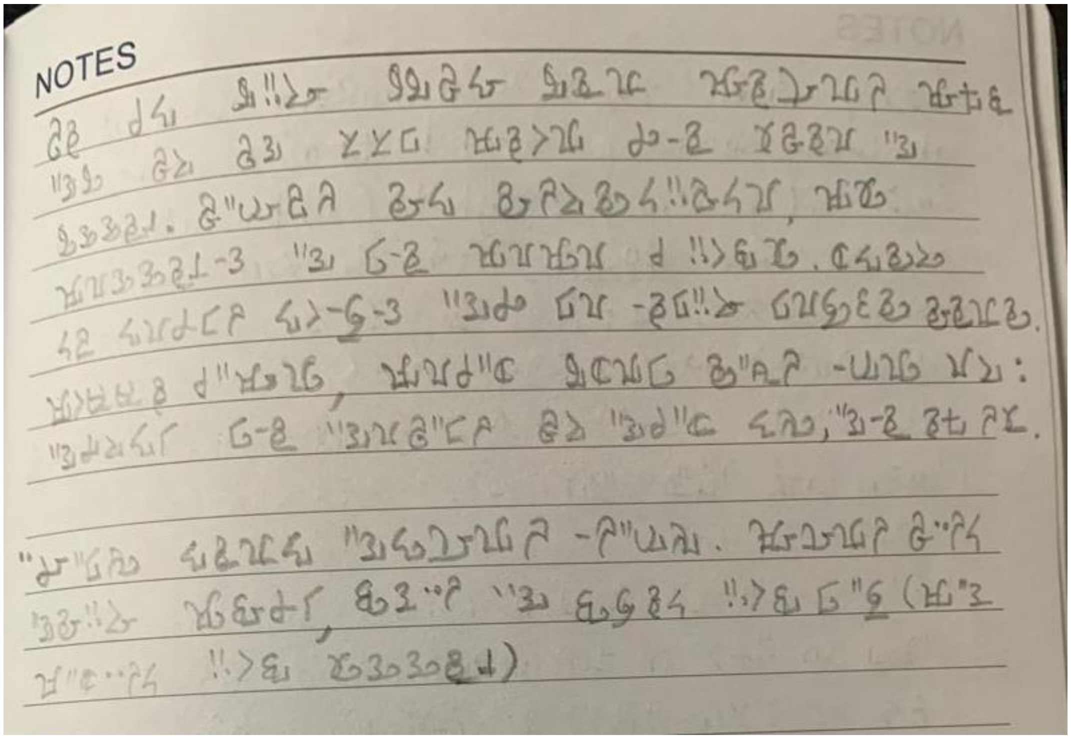
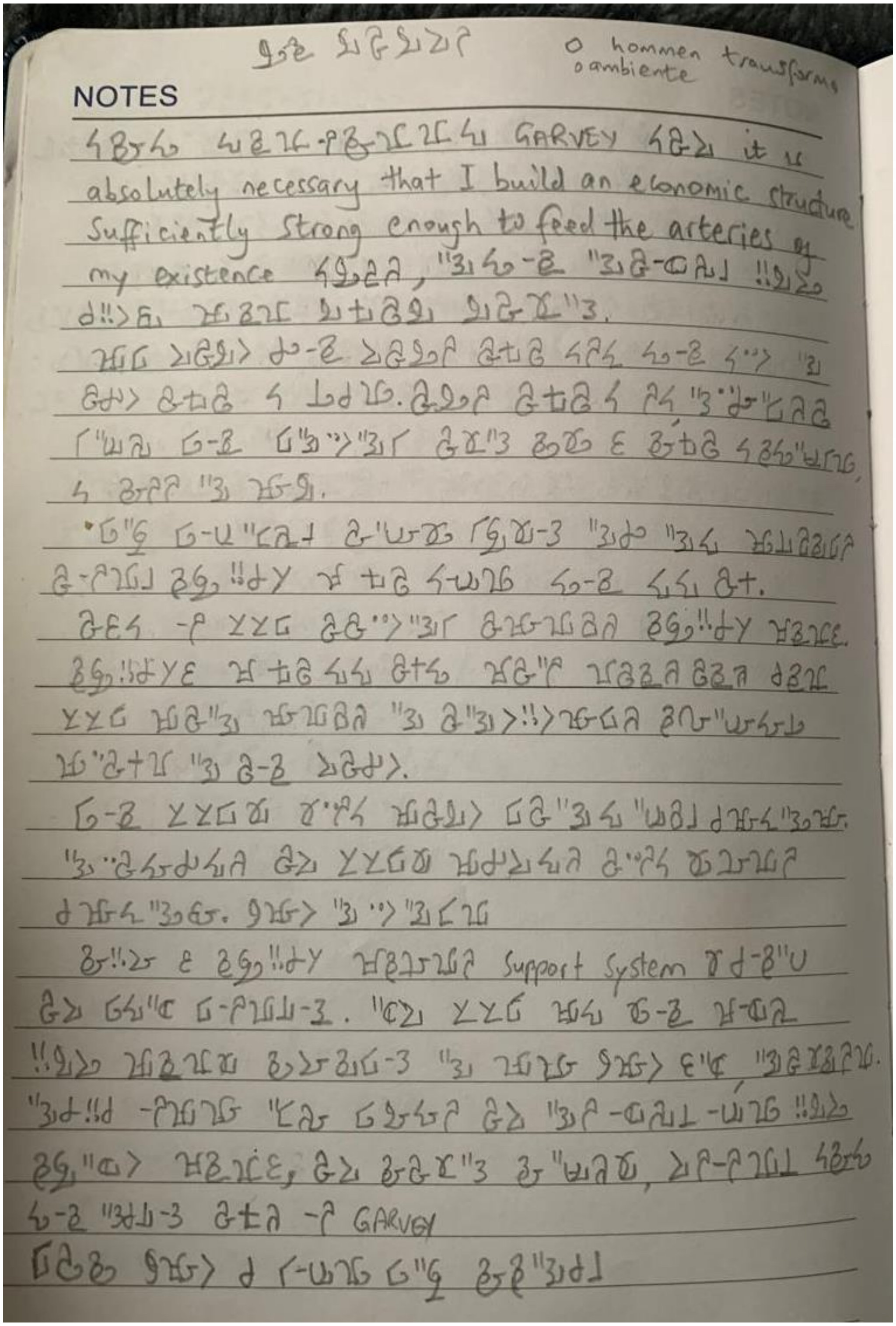


Figure 88.



[illegible] o hommen transforma o ambiente

NOTES

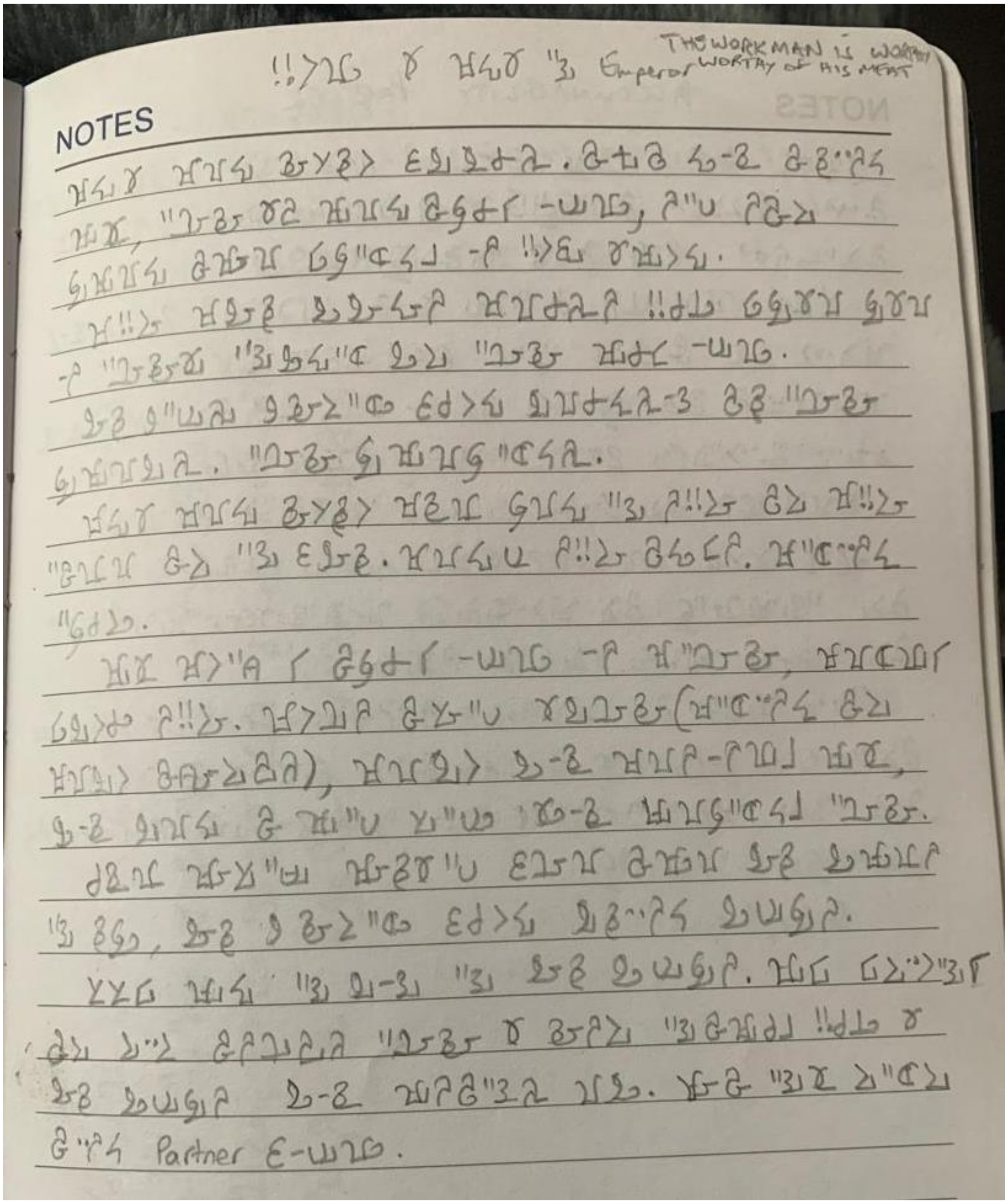
[illegible] GARVEY [illegible] it is absolutely necessary that I build an economic structure sufficiently strong enough to feed the arteries of my existence [illegible]

[illegible] Support System [illegible]

[illegible] GARVEY

[illegible]

Figure 89.



Emperor

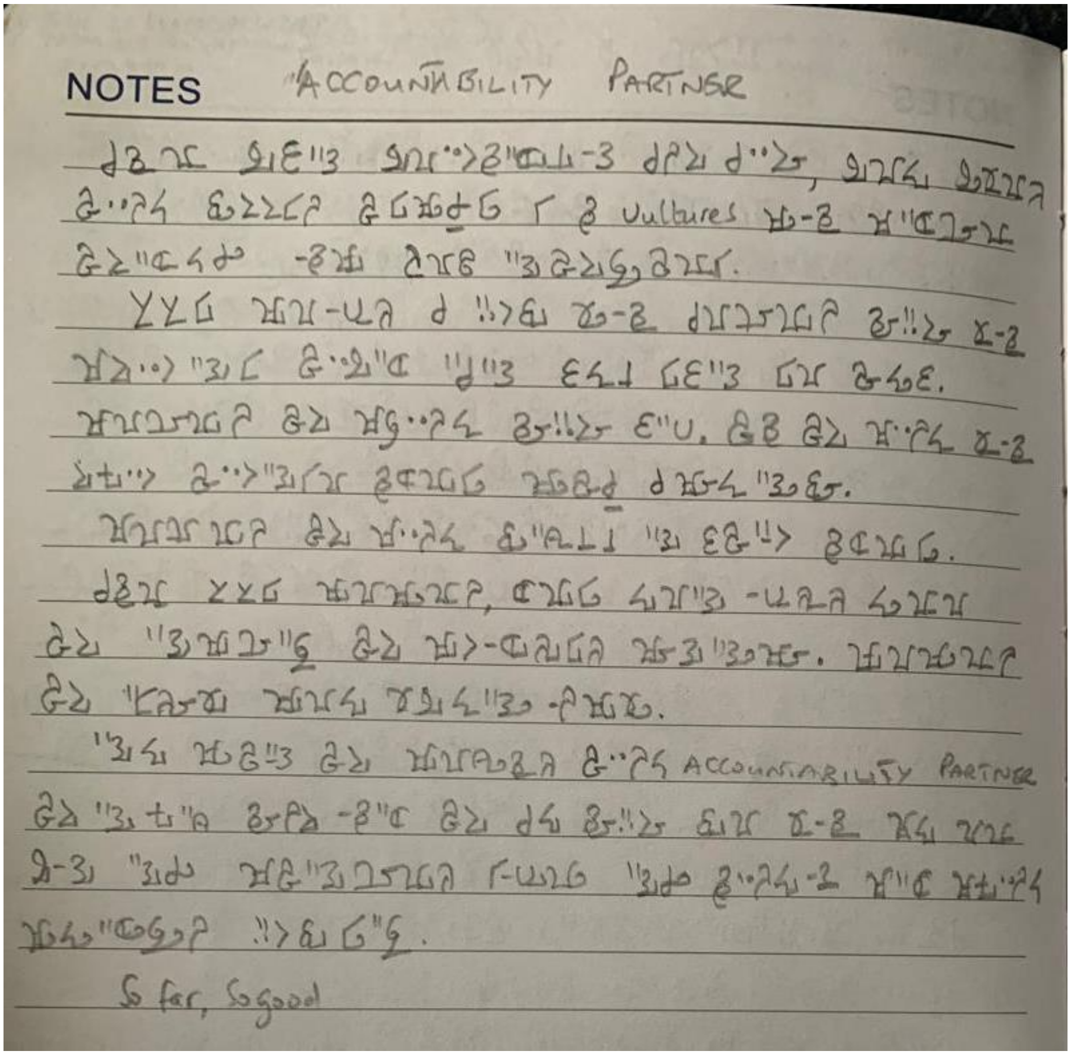
THE WORKMAN is WORTHY

WORTAY of HIS MEAT

NOTES

Partner

Figure 90.



NOTES "ACCOUNTABILITY PARTNER

vultures

ACCOUNTABILITY PARTNER

So far, So good

Figure 91.

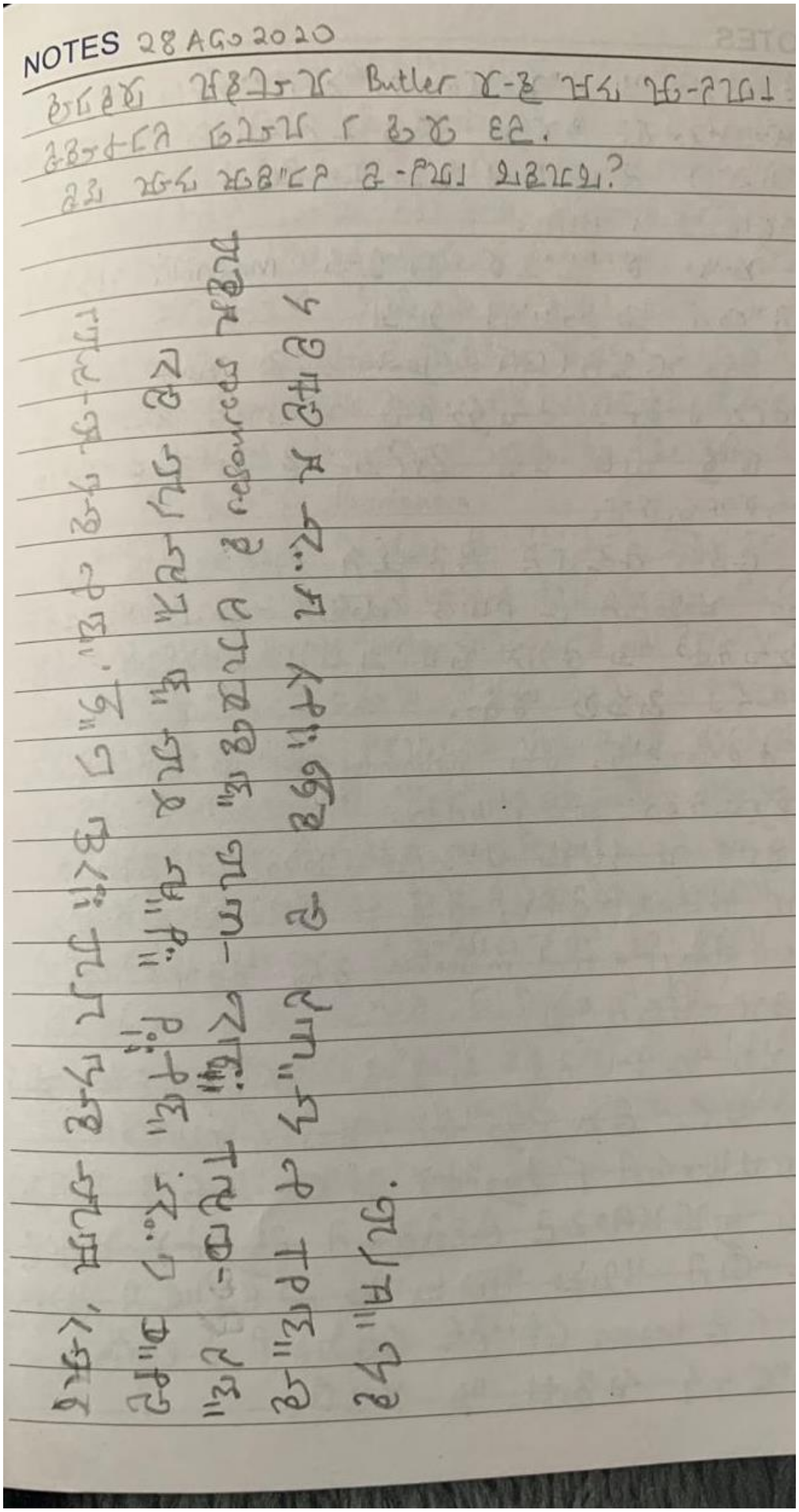

NOTES 28 AGO 2020
Butler
resources

Figure 92.

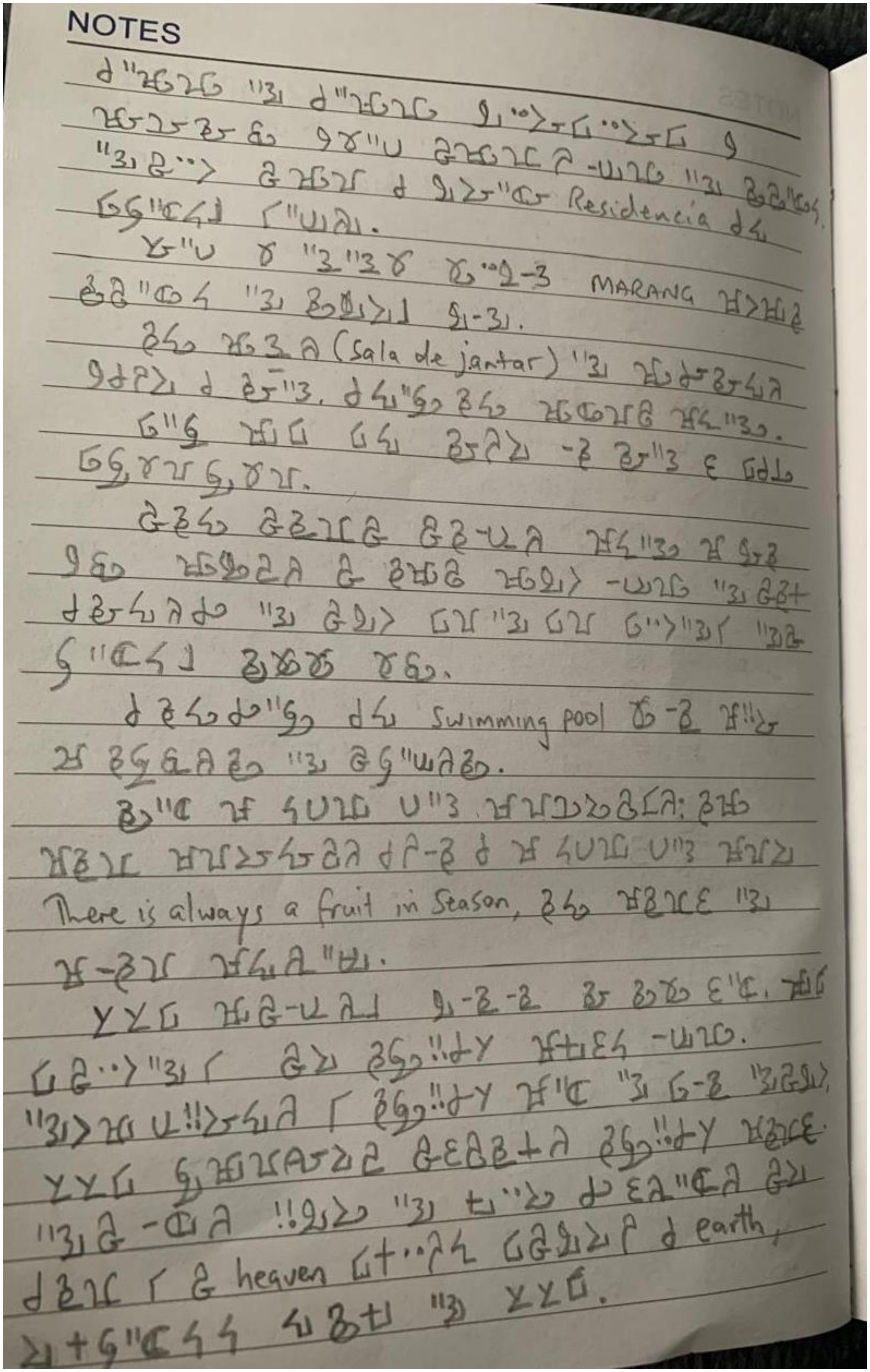

NOTES
Residencia
MARANG
(Sala de jantar)
Swimming pool
There is always a fruit in Season,
earth,
heaven

Figure 93.

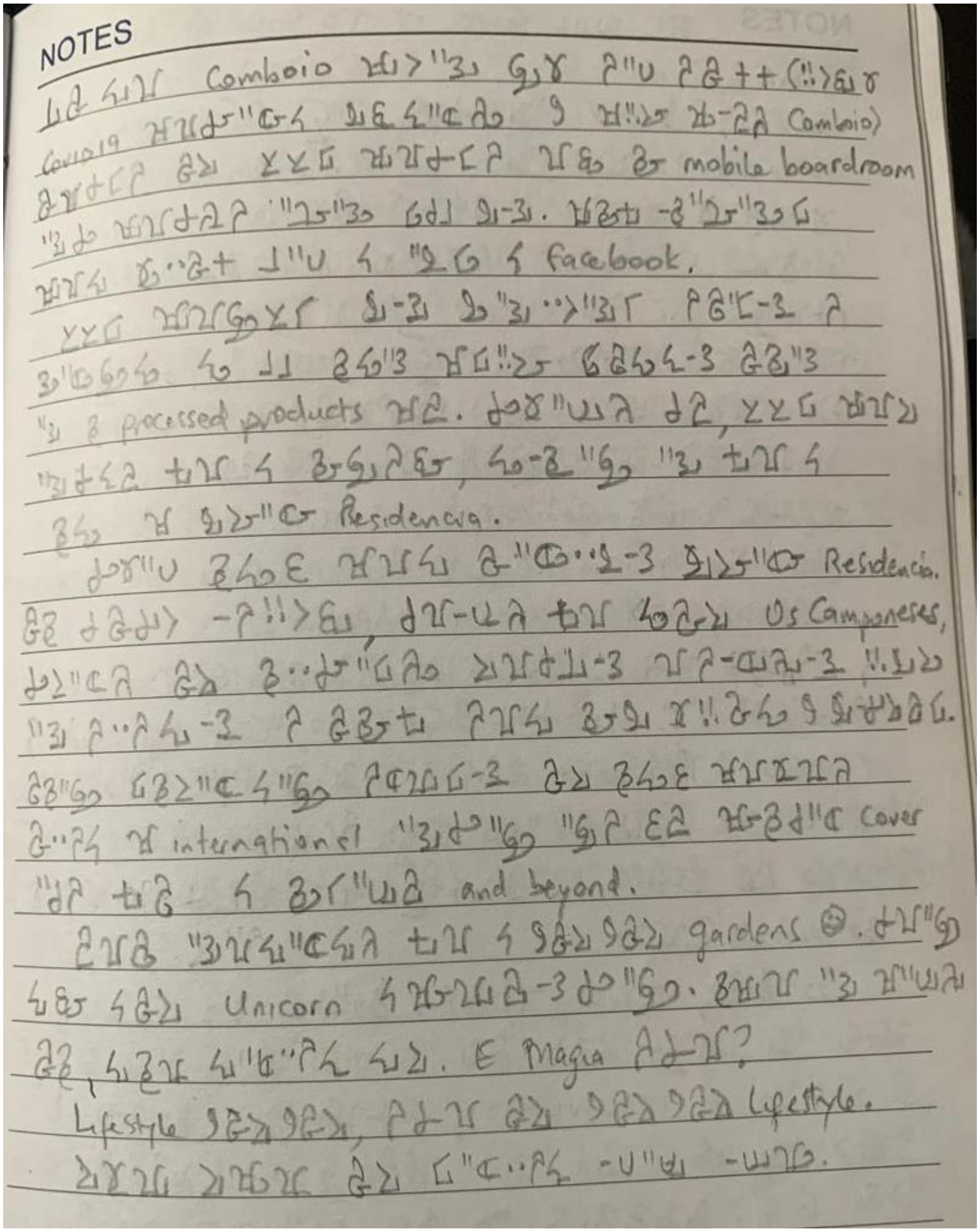
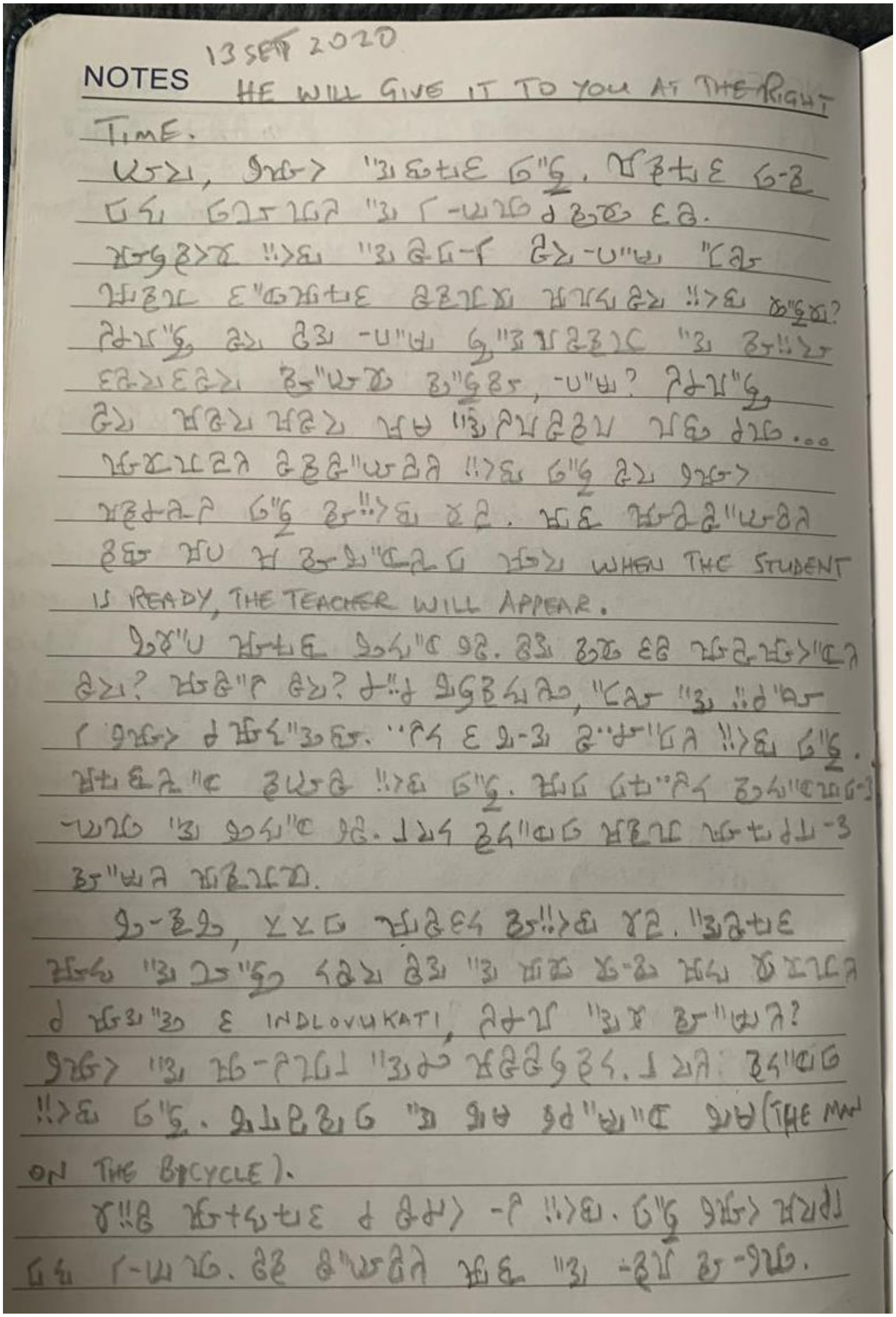


Figure 94.



13 SEP 2020

NOTES HE WILL GIVE IT TO YOU AT THE RIGHT TIME.

[illegible] WHEN THE STUDENT IS READY, THE TEACHER WILL APPEAR.

[illegible] INDLOVUKATI, [illegible] (THE MAN ON THE BICYCLE).

[illegible]

Figure 95.

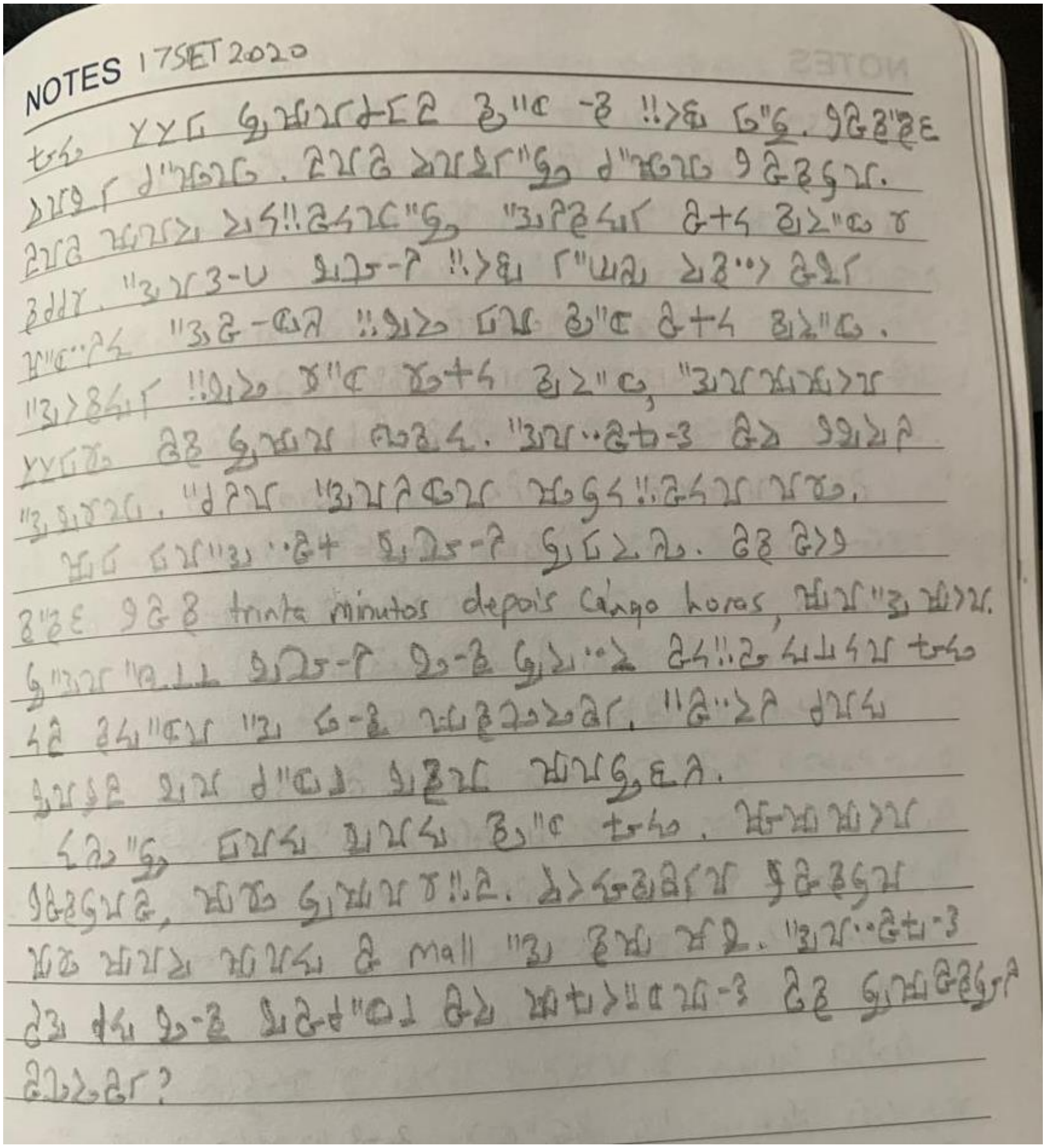


Figure 96.

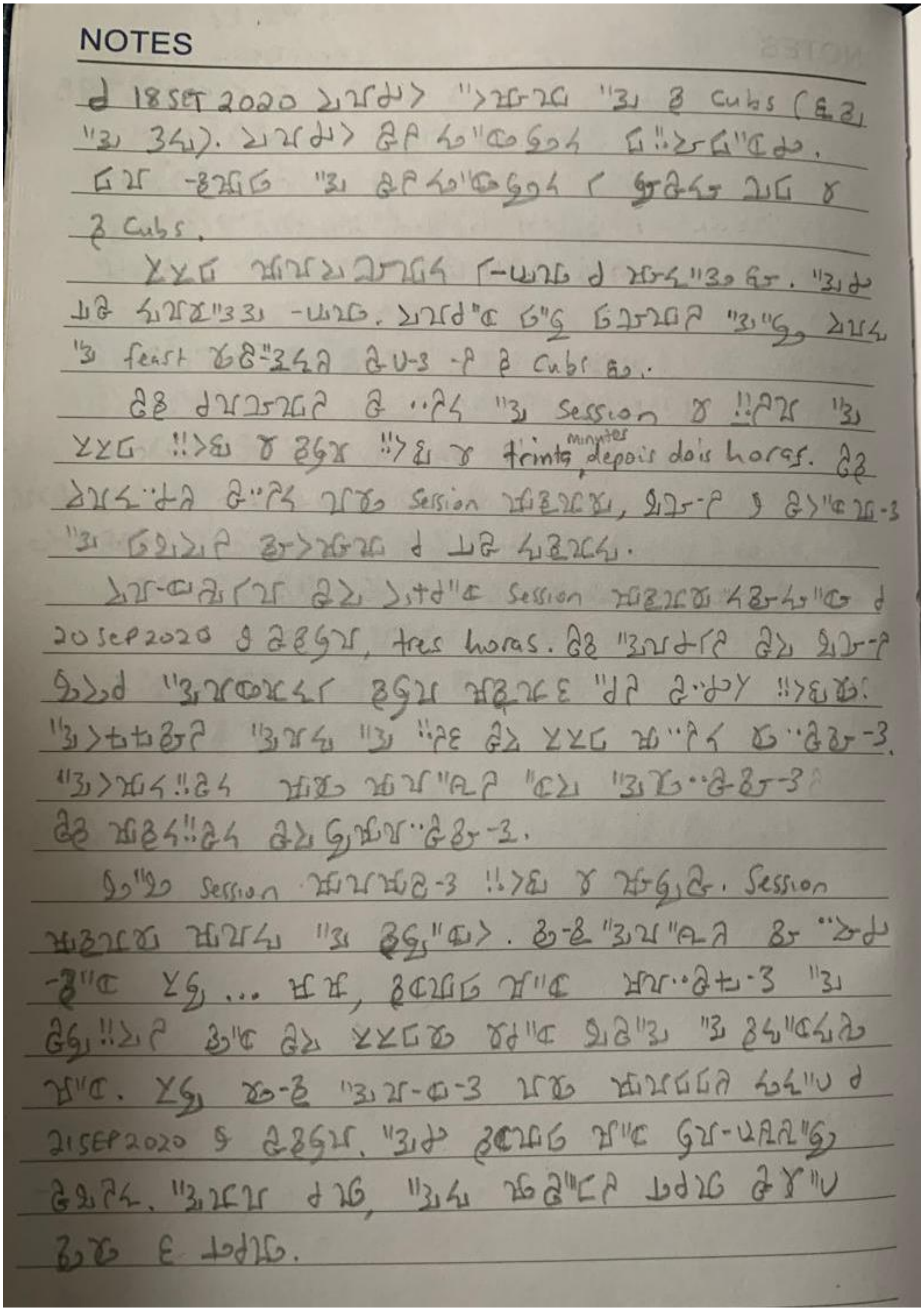
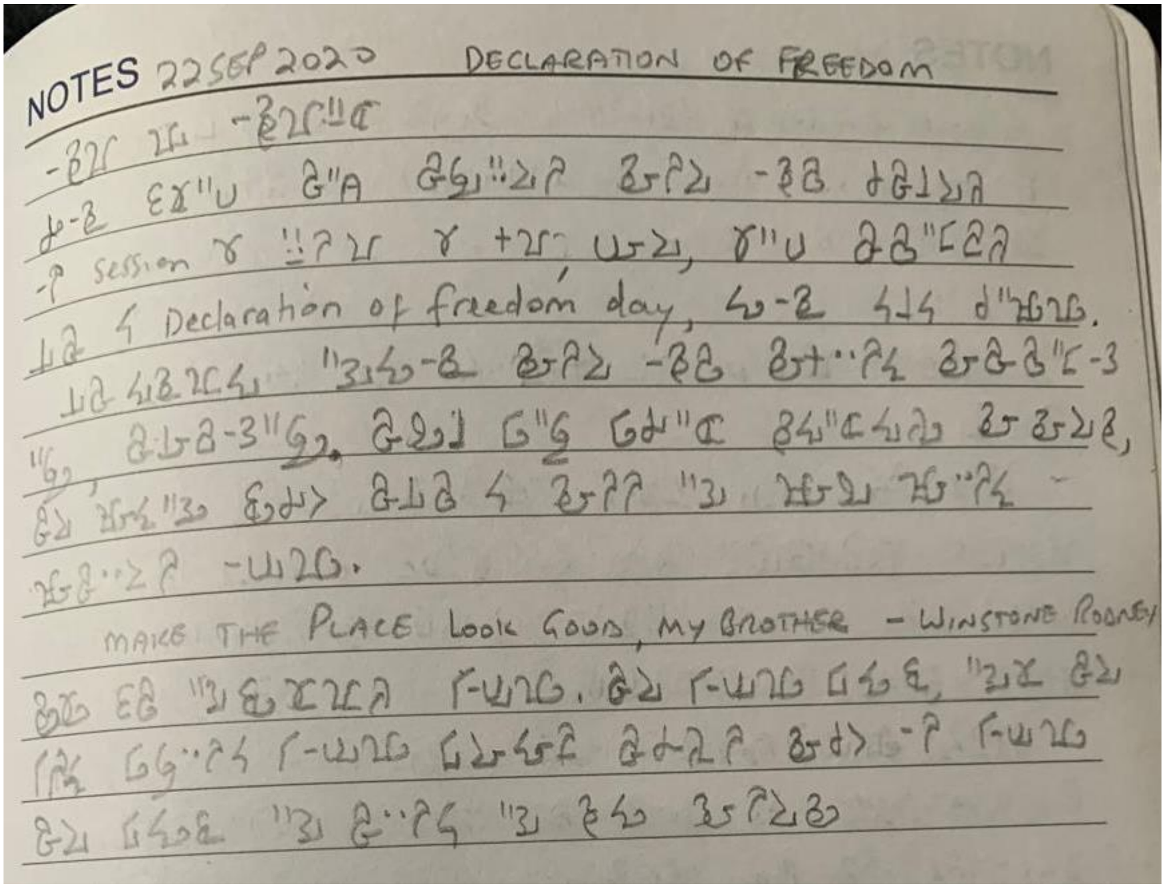


Figure 97.



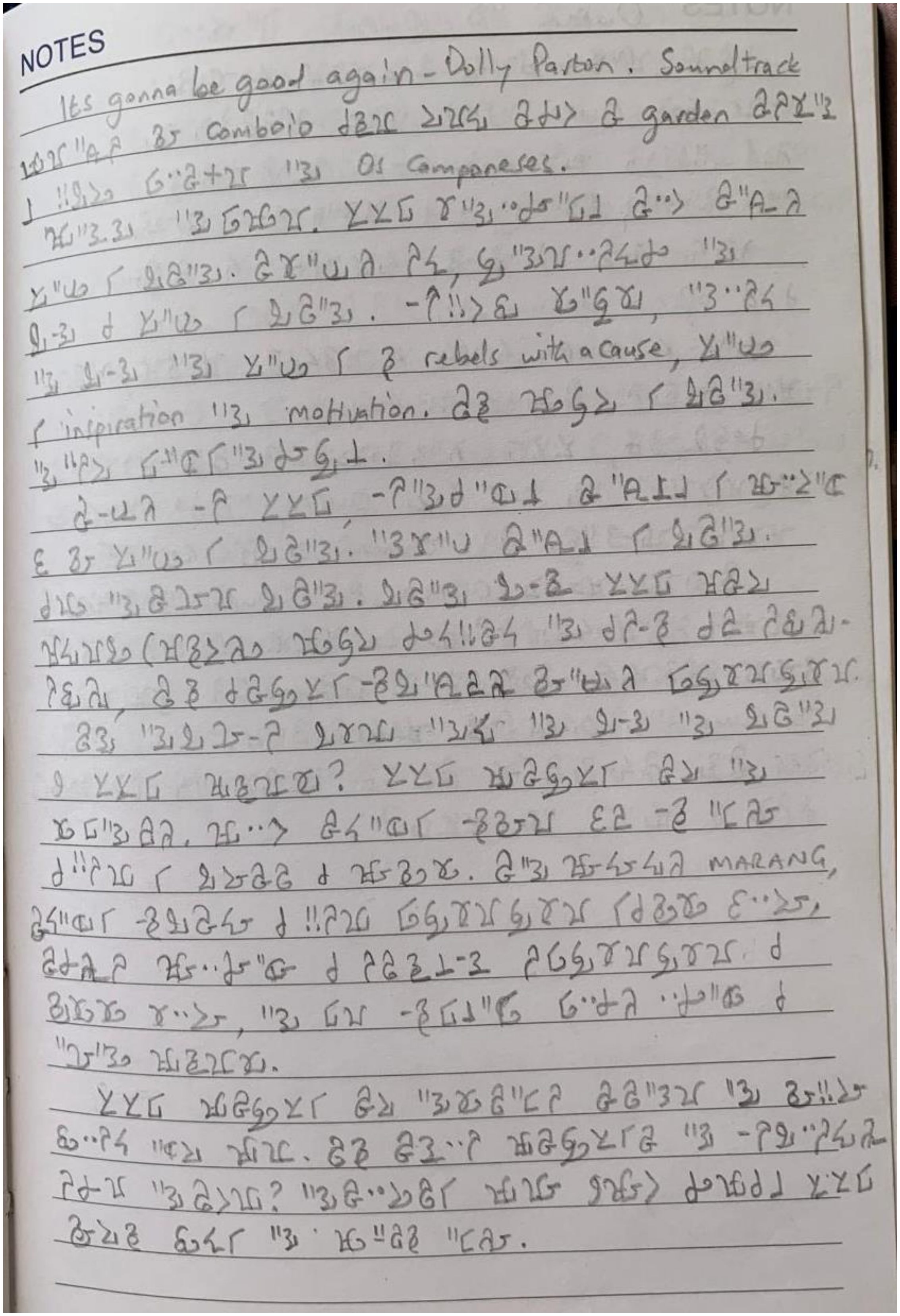
NOTES 22SEP2020 DECLARATION OF FREEDOM

session

Declaration of freedom day,

MAKE THE PLACE LOOK GOOD, MY BROTHER – WINSTONE RODNEY

Figure 98.



NOTES

Its gonna be good again - Dolly Parton. Soundtrack

Figure 99.

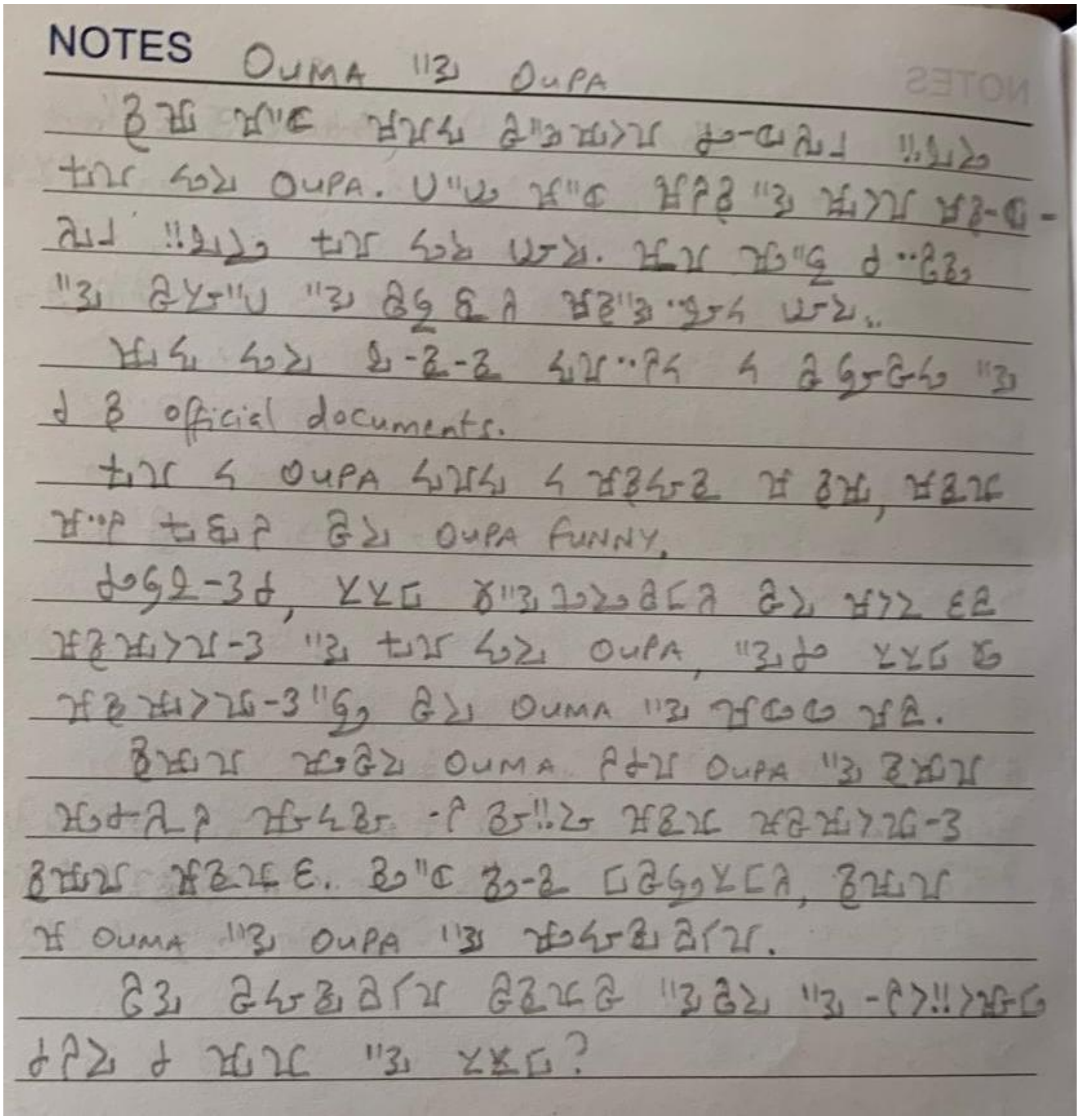


Figure 100.

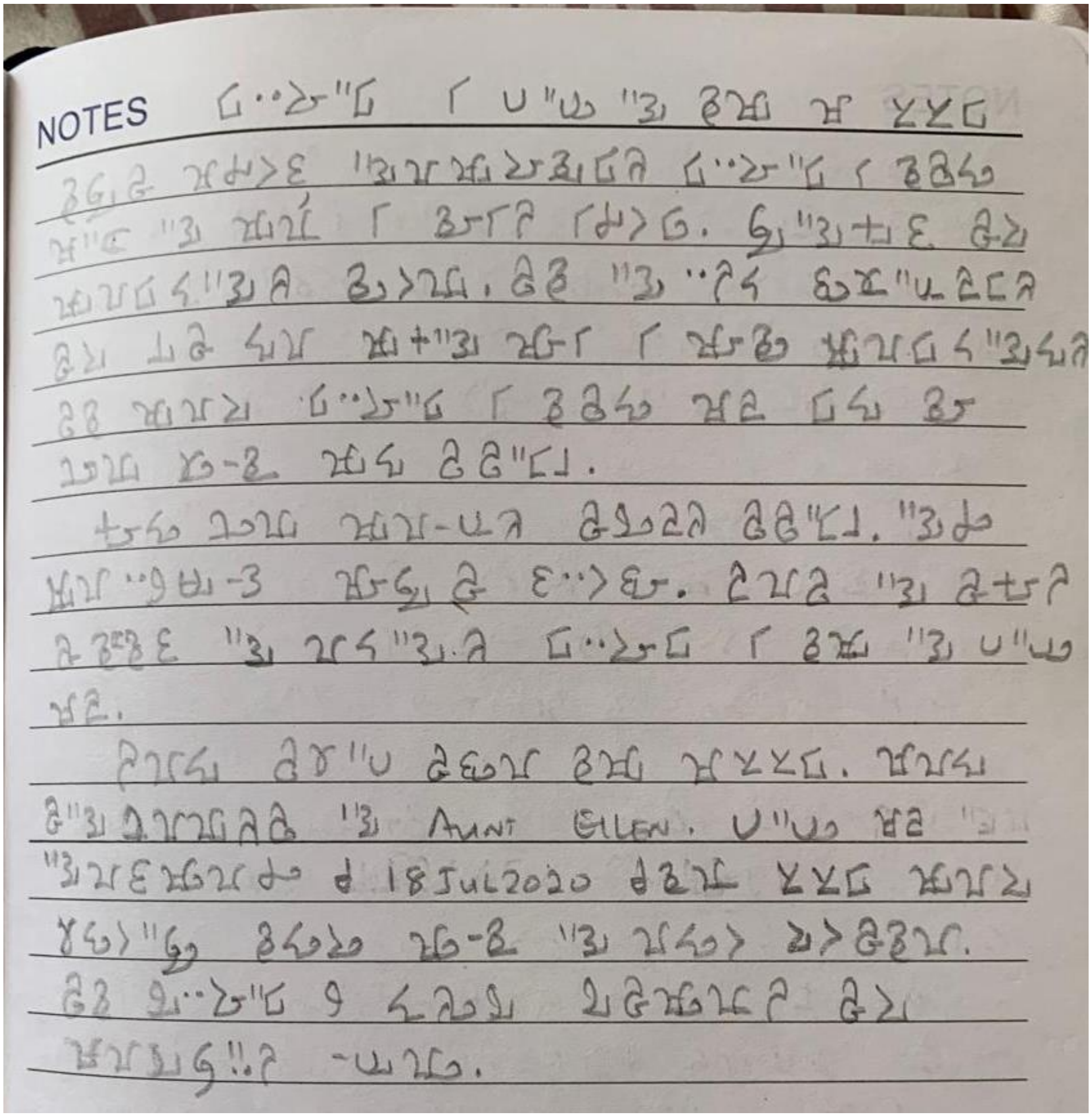
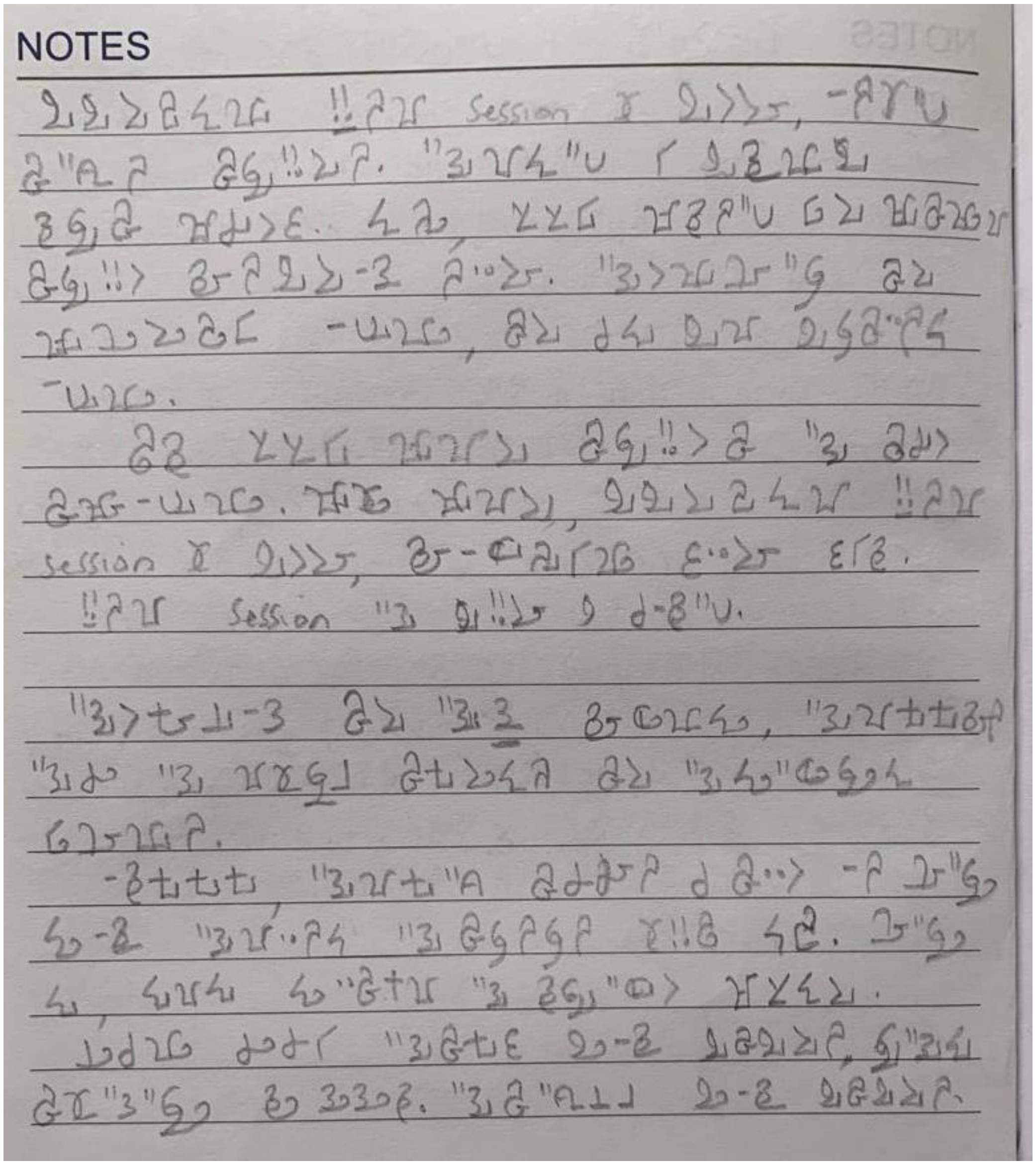
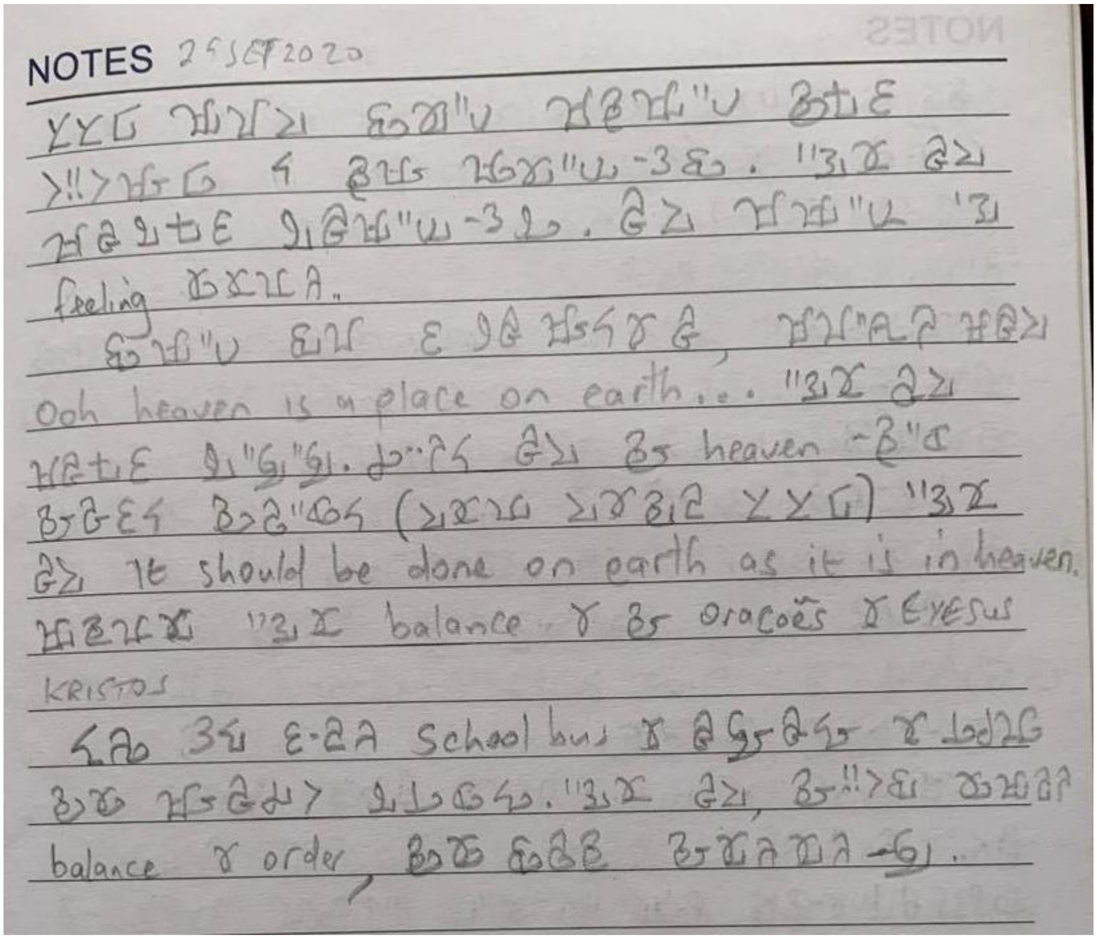

NOTES
Aunt Ellen
18 Jul 2020

Figure 101.



NOTES

Figure 102.



NOTES 25SEP2020

[illegible]

[illegible]

[illegible]

feeling [illegible].

[illegible]

Ooh heaven is a place on earth... [illegible]

[illegible] heaven [illegible]

[illegible] ([illegible]) [illegible]

[illegible] It should be done on earth as it is in heaven.

[illegible] balance [illegible] oracoës [illegible] YESUS

KRISTOS

[illegible] School bus [illegible]

[illegible]

balance [illegible] order, [illegible]

Figure 103.

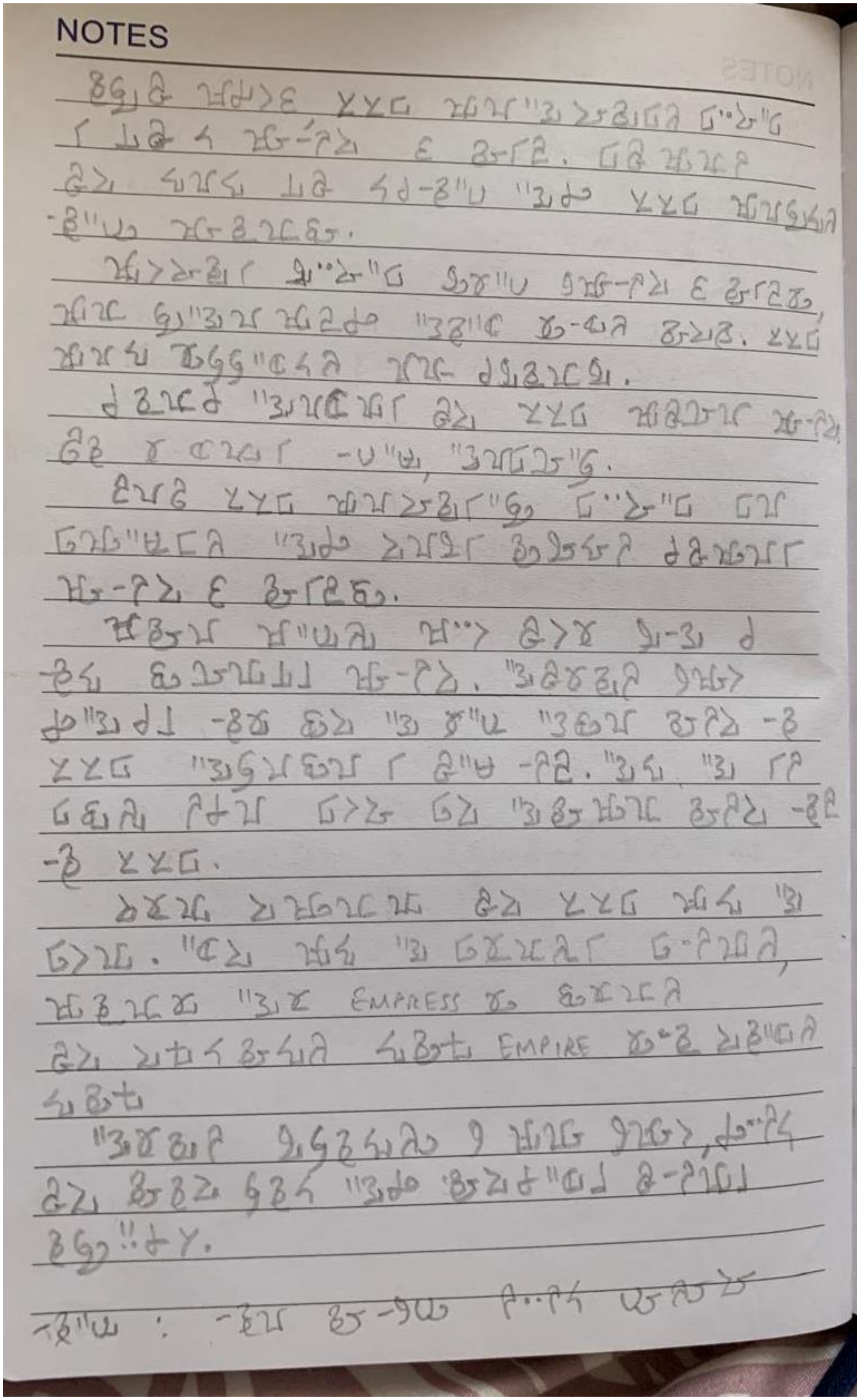

NOTES
EMPRESS
EMPIRE

Figure 104.

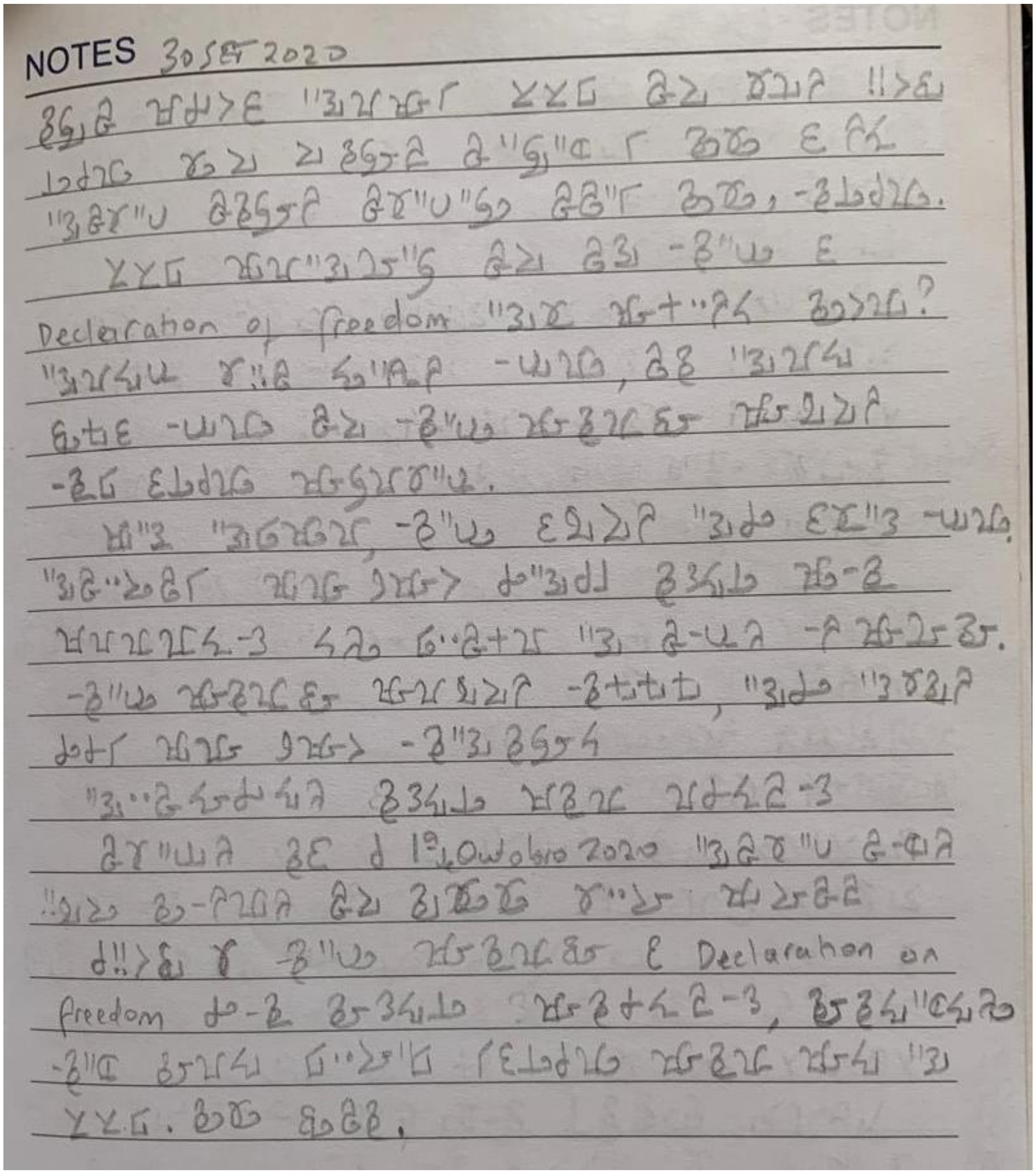


Figure 105.

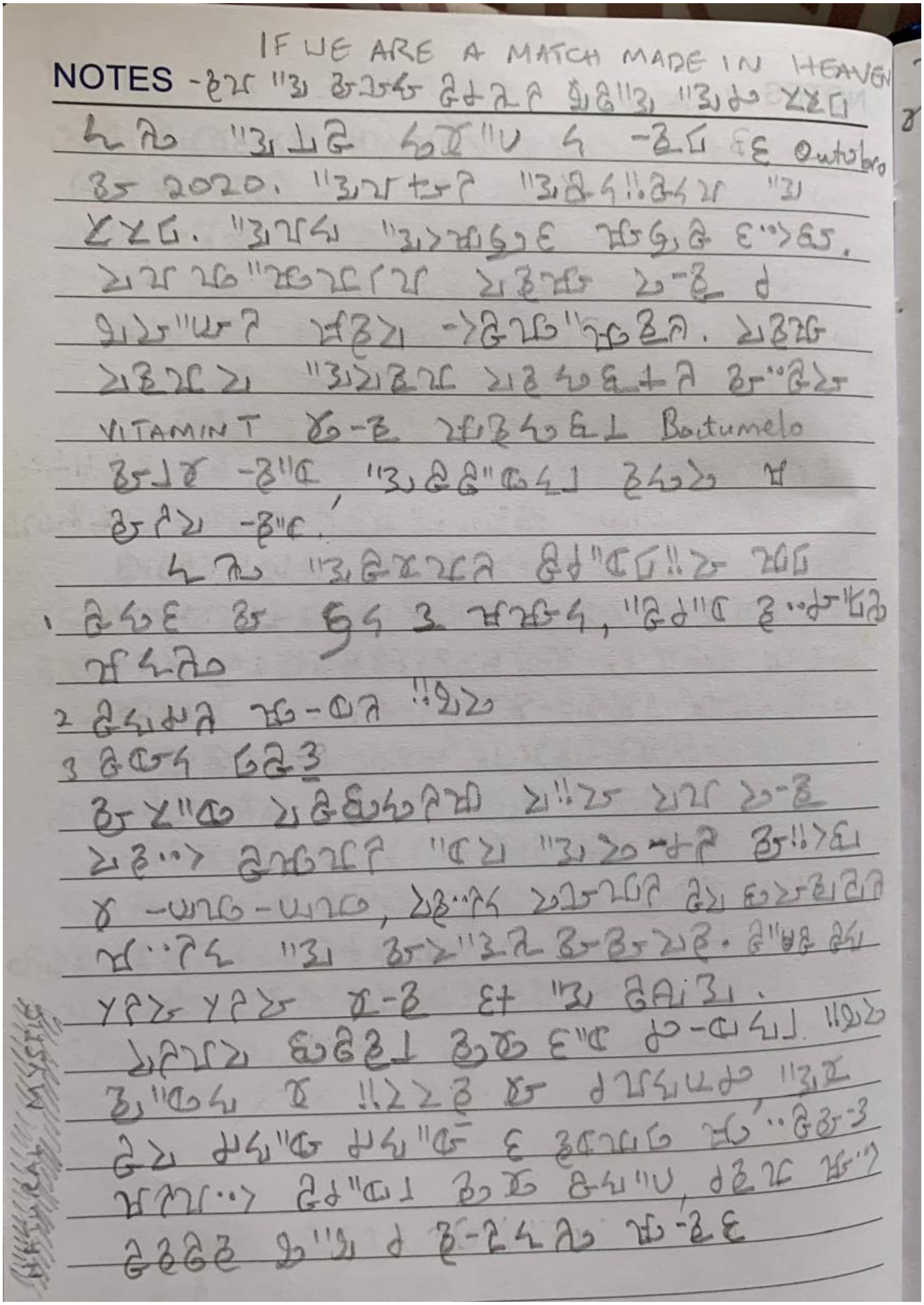

IF WE ARE A MATCH MADE IN HEAVEN
NOTES
Outubro
2020.
VITAMIN T
Batumelo
1
2
3

Figure 106.

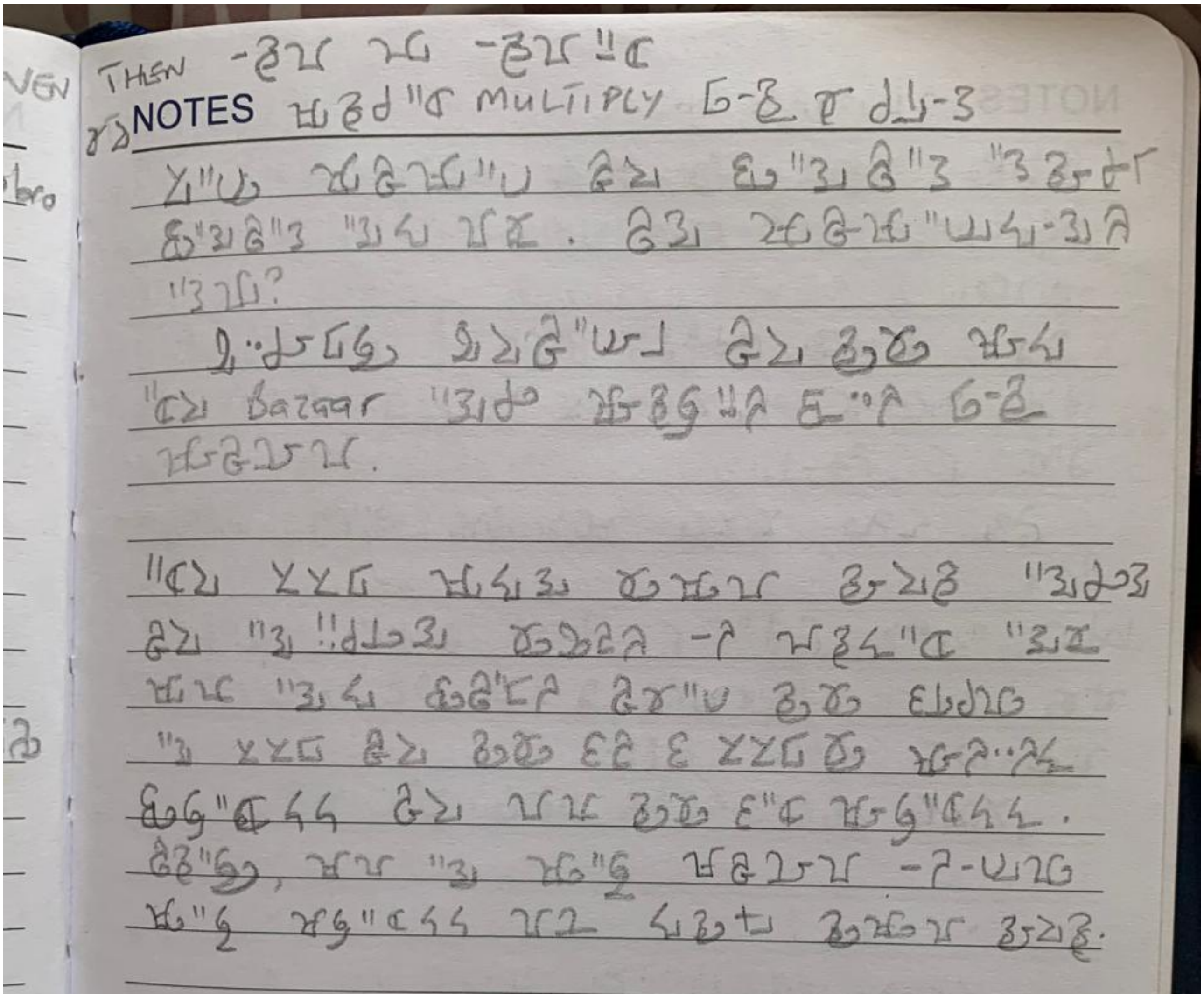
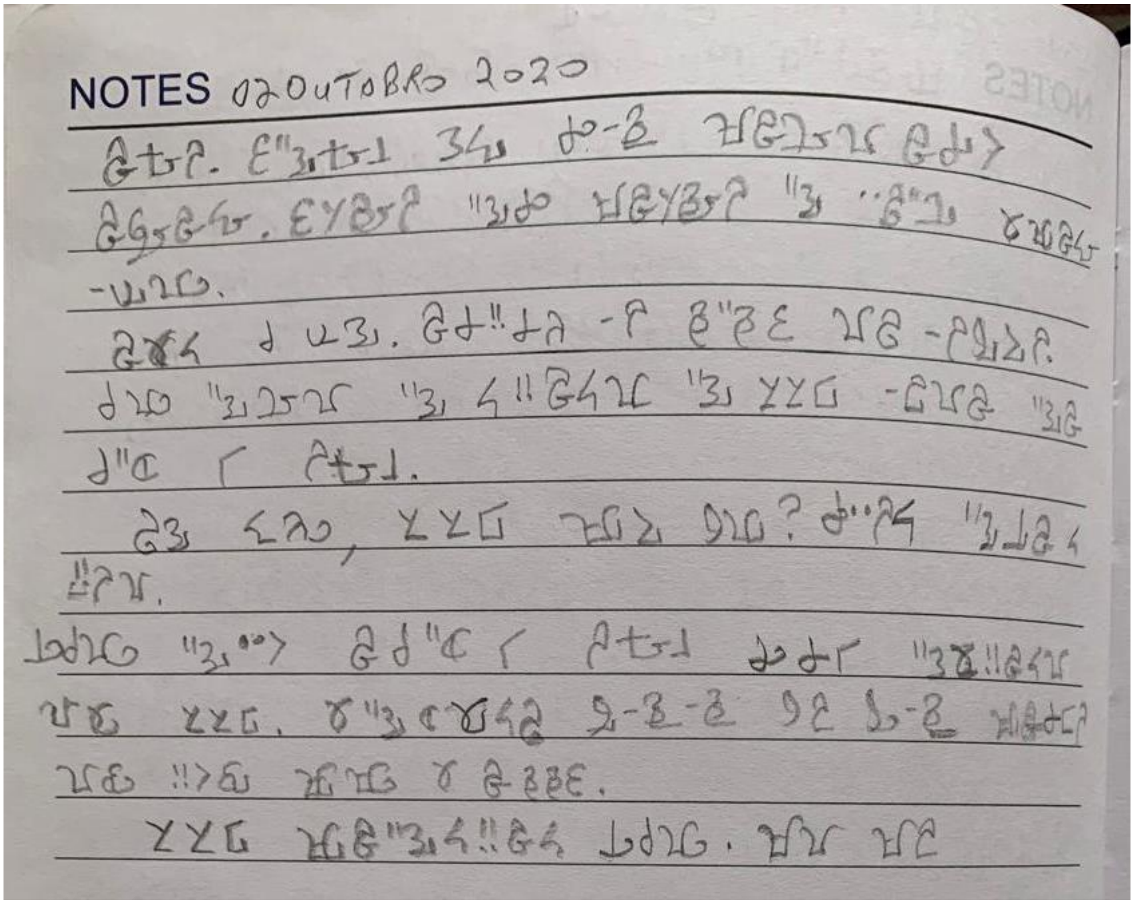
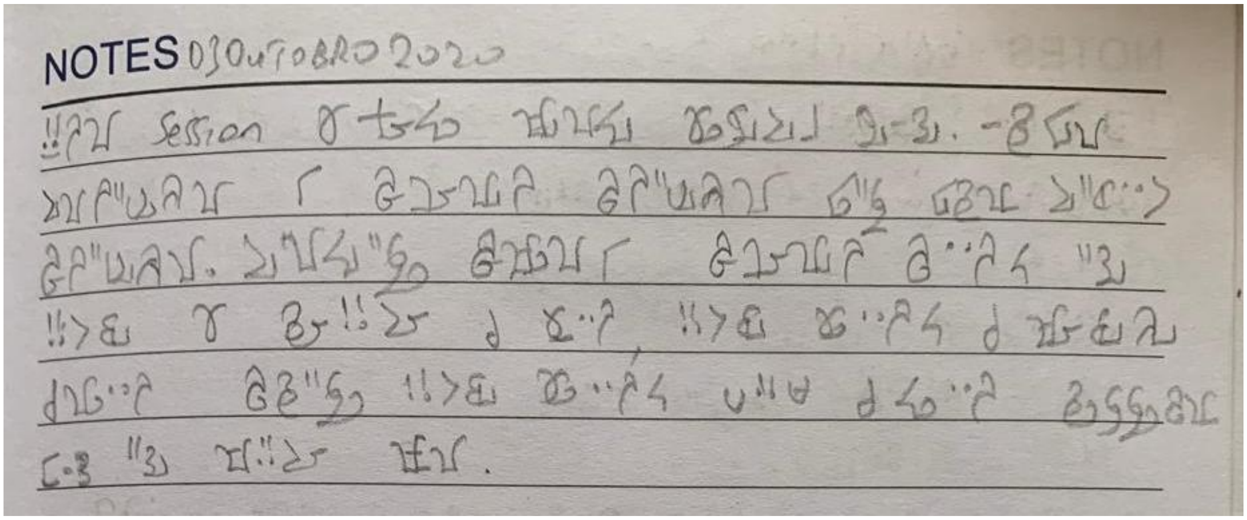


Figure 107.



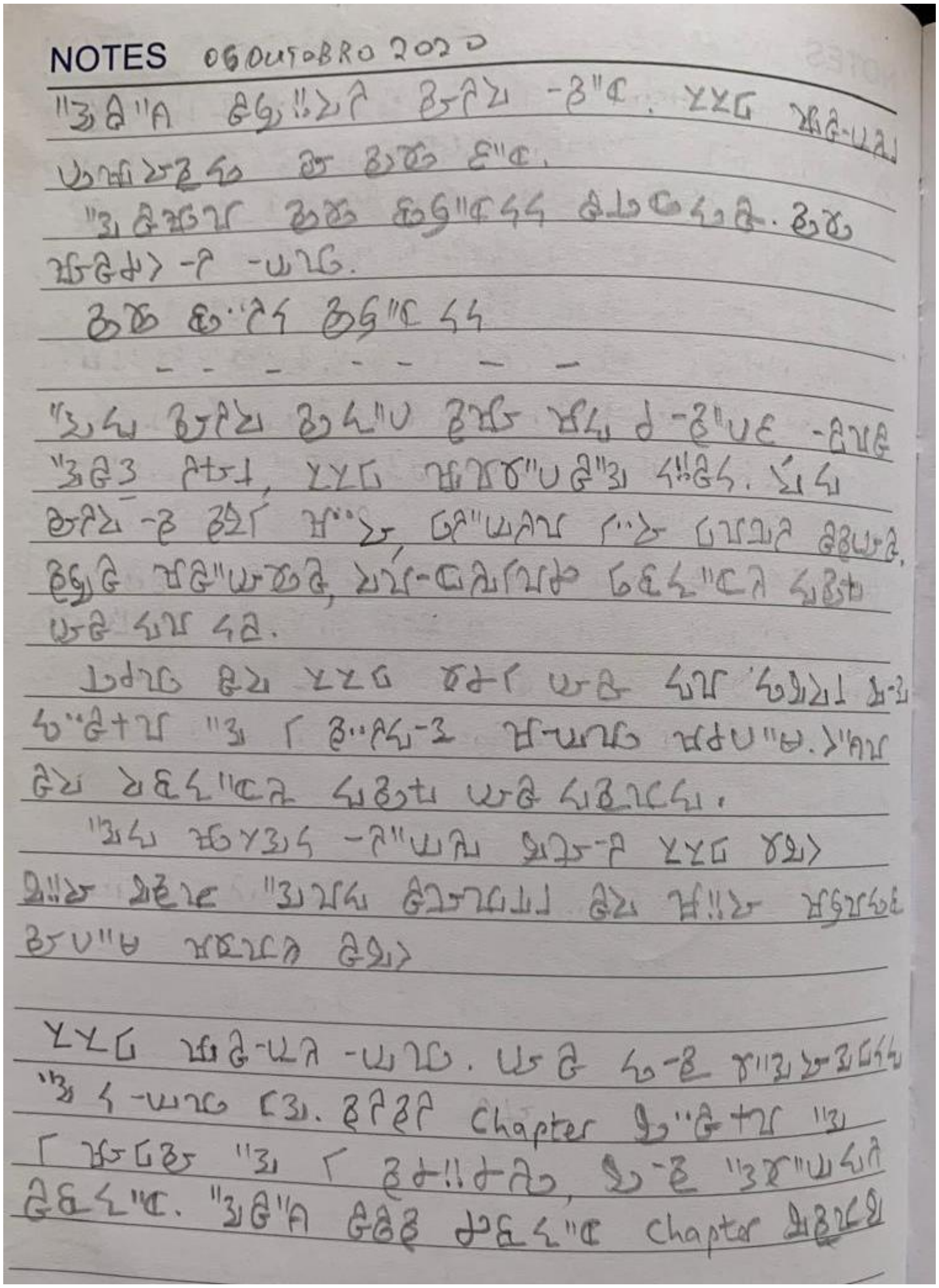
NOTES 02OUTUBRO 2020

Figure 108.



NOTES 03OUTUBRO2020

Figure 109.

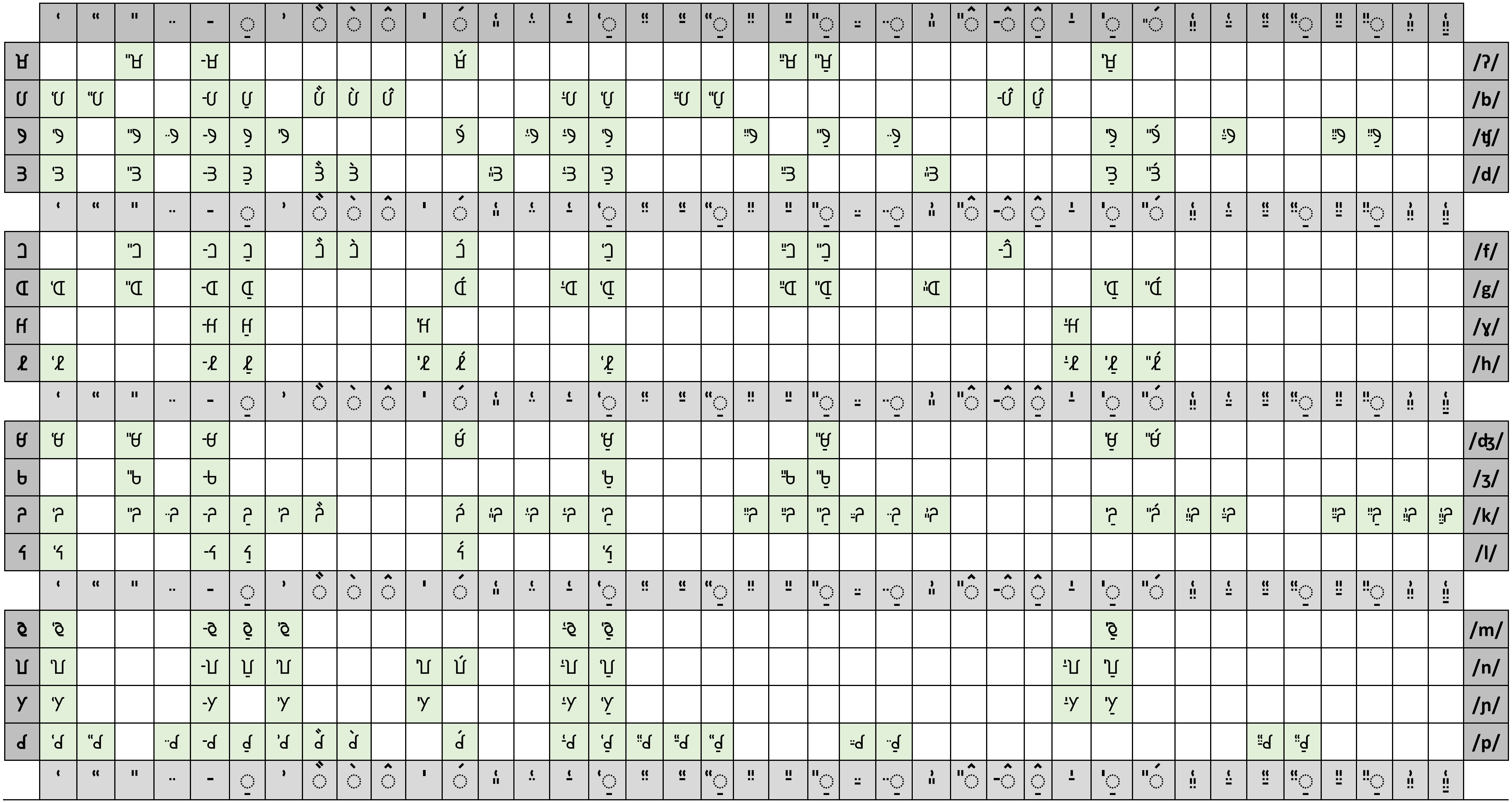


NOTES 06 OUTOBRO 2020

Figure 110.

X Linguistically Realized Mutuyo and Mituyo Stack Pairings with Misisi

The following table presents the Mutuyo and Mituyo stack pairings with the Misisi letters as found in the primary languages of Malawi. The table is equally valid when any of the Masiri are present. The table is offered as a reference for developers working on lexical projects such as spelling validation and input methods.


/ʔ/
/b/
/ʧ/
/d/
/f/
/g/
/ɣ/
/h/
/ʤ/
/ʒ/
/k/
/l/
/m/
/n/
/ɲ/
/p/

	ʻ	“	"	‥	-	◌̠	’	◌̏	◌̀	◌̂	ˈ	◌́	ʻ"	ʻ‥	ʻ-	ʻ◌̠	“"	“-	“◌̠	""	"-	"◌̠	‥-	‥◌̠	’"	"◌̂	-◌̂	◌̠̂	ˈ-	ˈ◌̠	"◌́	ʻ‼	ʻ‥-	“=	“◌̠	""-	"‥◌̠	’‼	ʻ‼-	
ᥲ	ᥲ				-ᥲ	ᥲ̠						ᥲ́			ʻ-ᥲ	ʻᥲ̠																								/r/
ց	ց		"ց		-ց	ց̠						ց́	ʻ"ց		ʻ-ց	ʻց̠					"-ց	"ց̠								ˈց̠	"ց́									/s/
ɕ	ɕ				-ɕ	ɕ̠									ʻ-ɕ	ʻɕ̠						"ɕ̠								ˈɕ̠										/ʃ/
ʖ	ʖ		"ʖ	‥ʖ	-ʖ	ʖ̠	’ʖ	ʖ̏	ʖ̀			ʖ́		ʻ‥ʖ	ʻ-ʖ	ʻʖ̠				""ʖ	"-ʖ	"ʖ̠	‥-ʖ	‥ʖ̠						ˈʖ̠	"ʖ́	ʻ‼ʖ				""-ʖ	"‥ʖ̠	’‼ʖ	ʻ‼-ʖ	/t/
	ʻ	“	"	‥	-	◌̠	’	◌̏	◌̀	◌̂	ˈ	◌́	ʻ"	ʻ‥	ʻ-	ʻ◌̠	“"	“-	“◌̠	""	"-	"◌̠	‥-	‥◌̠	’"	"◌̂	-◌̂	◌̠̂	ˈ-	ˈ◌̠	"◌́	ʻ‼	ʻ‥-	“=	“◌̠	""-	"‥◌̠	’‼	ʻ‼-	
ʃ	ʻʃ			‥ʃ	-ʃ	ʃ̠									ʻ-ʃ	ʻʃ̠				""ʃ		"ʃ̠		‥ʃ̠							"ʃ́						"‥ʃ̠			/ts/
ɦ	ʻɦ				-ɦ	ɦ̠									ʻ-ɦ																									/p’/
Ꭿ			"Ꭿ		-Ꭿ	Ꭿ̠				Ꭿ̂						ʻᎯ̠					"-Ꭿ	"Ꭿ̠				"Ꭿ̂	-Ꭿ̂			ˈᎯ̠	"Ꭿ́									/v/
Ɛ											ˈƐ																													/w/
	ʻ	“	"	‥	-	◌̠	’	◌̏	◌̀	◌̂	ˈ	◌́	ʻ"	ʻ‥	ʻ-	ʻ◌̠	“"	“-	“◌̠	""	"-	"◌̠	‥-	‥◌̠	’"	"◌̂	-◌̂	◌̠̂	ˈ-	ˈ◌̠	"◌́	ʻ‼	ʻ‥-	“=	“◌̠	""-	"‥◌̠	’‼	ʻ‼-	
ɤ	ʻɤ										ˈɤ																			ˈɤ̠										/j/
ɾ	ʻɾ		"ɾ		-ɾ	ɾ̠			ɾ̀	ɾ̂			ʻ"ɾ		ʻ-ɾ	ʻɾ̠					"-ɾ	"ɾ̠			’"ɾ		-ɾ̂	ɾ̠̂		ˈɾ̠	"ɾ́									/z/
f	ʻf		"f		-f								ʻ"f		ʻ-f						"-f										"f́									/dz/
ɘ	ʻɘ		"ɘ													ʻɘ̠					"-ɘ	"ɘ̠									"ɘ́									/dɬ/
	ʻ	“	"	‥	-	◌̠	’	◌̏	◌̀	◌̂	ˈ	◌́	ʻ"	ʻ‥	ʻ-	ʻ◌̠	“"	“-	“◌̠	""	"-	"◌̠	‥-	‥◌̠	’"	"◌̂	-◌̂	◌̠̂	ˈ-	ˈ◌̠	"◌́	ʻ‼	ʻ‥-	“=	“◌̠	""-	"‥◌̠	’‼	ʻ‼-	
ϙ			"ϙ		-ϙ								ʻ"ϙ		ʻ-ϙ	ʻϙ̠					"-ϙ	"ϙ̠																		/ɬ/
ʕ			"ʕ										ʻ"ʕ		ʻ-ʕ						"-ʕ										"ʕ́									/ǁ/
ɸ	ʻɸ		"ɸ													ʻɸ̠					"-ɸ										"ɸ́									/!/
Ր			"Ր																		"-Ր					"Ր̂	-Ր̂													/ð/
	ʻ	“	"	‥	-	◌̠	’	◌̏	◌̀	◌̂	ˈ	◌́	ʻ"	ʻ‥	ʻ-	ʻ◌̠	“"	“-	“◌̠	""	"-	"◌̠	‥-	‥◌̠	’"	"◌̂	-◌̂	◌̠̂	ˈ-	ˈ◌̠	"◌́	ʻ‼	ʻ‥-	“=	“◌̠	""-	"‥◌̠	’‼	ʻ‼-	

XI ISO Proposal Summary Forms

ISO/IEC JTC 1/SC 2/WG 2

PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS

FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**

Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**

See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** ***Proposal for Encoding the Mwangwego Script in the UCS***

2. Requester's name: *Oreen Yousuf, Daniel Yacob*

3. Requester type (Member body/Liaison/Individual contribution): *Individual Contribution*

4. Submission date: *2024-11-08*

5. Requester's reference (if applicable):

6. Choose one of the following:

This is a complete proposal: *Yes*

(or) More information will be provided later:

B. Technical – General

1. Choose one of the following:

a. This proposal is for a new script (set of characters): *Yes*

Proposed name of script: *Mwangwego*

b. The proposal is for addition of character(s) to an existing block:

Name of the existing block:

2. Number of characters in proposal: *64*

3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary	X	B.1-Specialized (small collection)		B.2-Specialized (large collection)	
C-Major extinct		D-Attested extinct		E-Minor extinct	
F-Archaic Hieroglyphic or Ideographic				G-Obscure or questionable usage symbols	

4. Is a repertoire including character names provided? *Yes*

---

[1] Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

a. If YES, are the names in accordance with the “character naming guidelines”

in Annex L of P&P document?

b. Are the character shapes attached in a legible form suitable for review? *Yes*

5. Fonts related:

a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?

Athinkra

b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):

Athinkra, LLC, yacob@geez.org, https://github.com/athinkra/mwangwego-book

6. References:

a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*

b. Are published examples of use (such as samples from newspapers, magazines, or other sources)

of proposed characters attached? *Yes*

7. Special encoding issues:

Does the proposal address other aspects of character data processing (if applicable) such as input,

presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *Yes*

A sorting description is enclosed.

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *Yes*

If YES explain *Latest proposal L2/12-311*

2. Has contact been made to members of the user community (for example: National Body,

user groups of the script or characters, other experts, etc.)? *Yes*

If YES, with whom? *Script creator, script users*

If YES, available relevant documents: *Enclosed in the proposal*

3. Information on the user community for the proposed characters (for example:

size, demographics, information technology use, or publishing use) is included?	*Yes*
Reference:	*Enclosed in the proposal*
4. The context of use for the proposed characters (type of use; common or rare)	*Rare*
Reference:	*Enclosed in the proposal*
5. Are the proposed characters in current use by the user community?	Yes
If YES, where? Reference:	*Malawi*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?	*No*
If YES, is a rationale provided?	
If YES, reference:	
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	*Yes*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?	*No*
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?	*No*
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character?	*Yes*
If YES, is a rationale for its inclusion provided?	*Yes*
If YES, reference:	*Enclosed in the proposal*
11. Does the proposal include use of combining characters and/or use of composite sequences?	*No*
If YES, is a rationale for such use provided?	
If YES, reference:	
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?	
If YES, reference:	
12. Does the proposal contain characters with any special properties such as control function or similar semantics?	*No*

If YES, describe in detail (include attachment if necessary)

13. Does the proposal contain any Ideographic compatibility characters? *No*

If YES, are the equivalent corresponding unified ideographic characters identified?

If YES, reference: