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WHERE ARE THE SOUND ALTERNATIONS IN 2021?

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In memory of Professor David Stampe (1938-2020)

ABSTRACT

This text presents the historical review of the term "sound alternations". Kruszewski (1995 [1881]) asserts that sound alternations are psychophonetic (phonological) strategies which replace some sound representations with others. There are three ways to create sound substitutions: first category (regular replacements and phonetic motivation clearly recognizable in synchrony), second category (substitutions with some morphological restrictions but also synchronic remains of regular historical sound causes) and third category (alternations with lexical or grammatical restrictions but without constant physiological motivations that can not be identified clearly in synchrony). Researchers such as Bloomfield (1939), Stampe (1979) and Donegan and Stampe (1979) had recovered this through the distinctions between phonological processes and (morphonological) rules. Although Anderson (1981) tried to reduce this ontological distinction in phonology, Churma (1985) went against this, focusing on the importance of the phonetic motivation vs. semantic restrictions in synchronous studies. Stampe (1985) asserts that the relationship between sound alternations of first and second category is more gradual than previously we had known. Hurch (1994; 1996) ratified these statements, especially, with prosodic alternations such as accentuations. Pragmatic-circumstantial and sound-symbolic/sound-iconic cases of alternations should be included on a continuum, which breaks with the strict equivalence between second category sound alternation and the morphological nature of all rules.

KEYWORDS: SOUND ALTERNATIONS, PROCESSES, RULES, GRADUALNESS, SYNCHRONY

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1. SOUND ALTERNATIONS FROM THE SECOND HALF OF THE 19TH CENTURY TO THE FIRST HALF OF THE 20TH CENTURY

The concept of sound alternation is one that has already been present during 140 years in the history of phonology. It refers to the different substitutions of timbric and suprasegmental sound properties behave in the use and perception of speakers within each community, taking into consideration that they are subject to affectation due to phonetic, grammatical, lexical or semantic-pragmatic motivations. Its origins lead us to the Kazan School, whose main theorists, Mikołay Kruszewski and Jan Baudouin de Courtenay, overcomed two theoretical postulates that were in vogue for the success of neogrammarian thought: the regularity of the sound change and the non equivalence between phoneme and phone.

Regarding the sound change, it is considered that its regularity is not permanent in time, with which it can acquire several limitations in its application up to it could be disappeared or only manifests itself under certain grammatical restrictions. For example, Kruszewski (1995 [1881], pp.11-22) established that sound substitutions obey three categories, first, second and third, which entail separation based on two criteria: the regularity of the phonetic motivation and the influence of morphology on the manifestation of alternation.

The first category alternations are quite regular respect to phonetic motivation, lacking restrictions by classes of words (verbs, nouns, adjectives) and/or by properties of number, gender, time, mode, aspect, person, etc. For example, we have hypothetical illustrations of two paradigms, one nominal and one verbal, and phrases, which, from stage A to stage B, are set apart by making a replacement of the vowel *e* in contact with *u* due to a coarticulatory effect of posteriorization that makes more velar and consolidates a sequence of sounds with greater physiological efficiency. Furthermore, such motivation can be identified in synchrony. Table 1 shows the initial stage, without posteriorization, while Table 2 exposes the later stage.

Verb	Noun	Phrases
dibul**e**-u 'I eat'	kare 'writer (nominative singular)'	dof**e** urkos 'the tiger runs'
dibule-a 'You eat'	kar**e**-us 'writer (nominative plural)'	dofe zewas 'the tiger sleeps'
dibule-s 'He/she eats'	kare-t 'writer (accusative)'	dofe qas 'the tiger jumps'
dibule-x 'We eat'	kare-l 'writer (dative)'	dofe lints 'the tiger roars'
dibule-i 'They eat'	kare-b 'writer (genitive)'	dof**e** ufkis 'the tiger staggers'

Table 1. Initial stage, without vowel posteriorization.

Verb	Noun	Phrases
dibul**o**-u 'I eat'	kare 'writer (nominative singular)'	dof**o** urkos 'the tiger runs'
dibule-a 'You eat'	kar**o**-us 'writer (nominative plural)'	dofe zewas 'the tiger sleeps'
dibule-s 'He/she eats'	kare-t 'writer (accusative)'	dofe qas 'the tiger jumps'
dibule-x 'We eat'	kare-l 'writer (dative)'	dofe lints 'the tiger roars'
dibule-i 'They eat'	kare-b 'writer (genitive)'	dof**o** ufkis 'the tiger staggers'

Table 2. Stage with phonetically motivated synchronic vowel posteriorization.

The second category alternation is characterized by the fact that the phonetic motivation, although still partially recognizable in the synchronic data, must be inspected respect to reconstructions or historical records. In terms of productivity, its manifestations are considerably restricted due to the extent that its physiological conditioning has been suppressed, with which the manifestation of sound substitution is limited to a set of contacts between morphemes, with some semantic component exercising control. Table 2 can be compared with table 3. In the last one, the posteriorization now only occurs with the name, restricted by the nominative plural and accusative cases. Only by comparison of the other constituents in the paradigm and by the existence of a suffix with a velar vowel, it is recognized that the final *o* of the lexical morpheme comes from an *e* vowel originally. In the verb, the analogy normalized the paradigm in favor of the most frequent, with a final *e* vowel of the lexical morpheme.

Verb	*Noun*	*Phrases*
dibul**e**-u 'I eat'	kare 'writer (nominative singular)'	dof**e** urkos 'the tiger runs'
dibule-a 'You eat'	kar**o**-us 'writer (nominative plural)'	dofe zewas 'the tiger sleeps'
dibule-s 'He/she eats'	kar**o**-t 'writer (accusative)'	dofe qas 'the tiger jumps'
dibule-x 'We eat'	kare-l 'writer (dative)'	dofe lints 'the tiger roars'
dibule-i 'They eat'	kare-b 'writer (genitive)'	dof**e** ufkis 'the tiger staggers'

Table 3. *Stage with the posteriorized vowel in the name, especially, nominative plural and accusative cases.*

The third category alternation is one in which it is difficult to identify the origin of a variation between sounds in the synchronic registers, even within the same paradigm, with which it makes necessary to compare to reconstructions or historical texts for identifying a possible phonetic motivation. Table 4 provides a situation in which, by morphological levelling, the *karo* variant was extended to different nominal cases and the vowel of the plural nominative suffix was lost, with which the systematic phonetic motivation of the posteriorization, or its historical trace, is not found here.

Verb	*Noun*	*Phrases*
dibul**e**-u 'I eat'	kar**o** 'writer (nominative singular)'	dof**e** urkos 'the tiger runs'
dibule-a 'You eat'	kar**o**-z 'writer (nominative plural)'	dofe zewas 'the tiger sleeps'
dibule-s 'He/she eats'	kar**o**-t 'writer (accusative)'	dofe qas 'the tiger jumps'
dibule-x 'We eat'	kar**o**-l 'writer (dative)'	dofe lints 'the tiger roars'
dibule-i 'They eat'	kare-b 'writer (genitive)'	dof**e** ufkis 'the tiger staggers'

Table 4. *Stage without recognizable posteriorization*

Regarding the division between phoneme and phone (speech sound), Baudouin de Courtenay (1972 [1895]) emphasized the mental character of the first entity, being conceived as a unit that provides synthesized information on auditory impressions that are abstracted from different instances of speech sounds:

"The *phoneme* = a unitary concept belonging to the sphere of phonetics which exists in the mind thanks to a psychological fusión of the impressions resulting from the pronunciation of one and the same sound; it is the psychological equivalent of a speech sound" (Baudouin de Courtenay, 1972 [1895], p.152).

This concept of the phoneme will be reinforced by Sapir, who no longer only considers this entity as an only auditory-perceptual product, but also updateable and intentional, which is linked to specific sets of allophones:

> "In the physical world the nave speaker and hearer actualize and are sensitive to sunds, but what they feel themselves to be pronouncing and hearing are "phonemes." They order the fundamental elements of linguistic experience into functionally and aesthetically determina shapes, each of which is carved out by its exclusive laws of relationship within the complex total of all posible sound relationships" (Sapir, 1972 [1933], p.23).

Bloomfield (1939) reassumed the issue previously discussed by Kruszewski about the fact that not all sound alternations are oriented to carry a phonetic conditioning, as the case of the allophonic realizations of phonemes, but there are others that, due to their morphological restrictions, they cannot be equated. However, it establishes for the latter a special level of analysis known as "morphophonemic" (p.105), which is an intermediate stage between phonology, dealing only with first category alternations, and morphology, which works with third category alternations.

2. SOUND ALTERNATIONS SINCE THE SECOND HALF OF THE 20TH CENTURY

Although the postulation of a "morphophonemic" level did not remain because it does not present methodologies or objects of study defined and fully differentiated from phonology and morphology (cf. Lass, 1984, p.62), it preserves the fact of assuming that the sound alternations that affect phonemes and (allo)phones should not be considered as equivalent to those that only operate on a limited set of lexical items or phrases. A good reflection of this is identified in Stampe (1968), which takes up the need to differentiate between what depends on phonological domains such as the syllable or pauses (phonological alternations) and what is governed, at least partially, by concrete semantic properties (morphophonological alternations):

> "The phonological alternation, whether it is optional or obligatory, or whether it applies at all, depends on purely phonological conditions, like syllable division, pausing, etc. It assimilates the point of articulation of one a phonologically definable class of sounds, alveolar stops, to that of another such class, stops, regardless of whether any of these are phonemes in the language. The morphophonological alternations on the other hand, applies under partly morphological conditions, namely it affects the negative prefix 'in-', and a few other originally Romance prefixes, like 'in-' in 'imprint', 'con-' in 'combination', etc" (Stampe, 1968, p.15).

Stampe (1979) and Donegan and Stampe (1979) considered that sound alternations that are phonetically motivated in synchrony, capable of suppression and operative in specific prosodic domains, should be named *processes*; whereas the alternations restricted by the meaning of some morphemes, phrases or lexical items, even if some historical sound motivation can be identified, but with obligatory synchronous operation, are the *rules*. On the former, a classification is established according to two criteria: dimensionality and functions. The first division is established between context-free processes, which affect perception without being linked to a specific phonotactic context, and context-sensitive processes, which can substitute perception or production features, operating in specific prosodic domains and by contact with other sounds. Regarding the processes according to their function, three types are established: prosodic, which projects segmental contents (morphemes, lexical items, sentences) onto, for example, intonation, accentual or syllabic dispositions; fortitive, which optimizes properties of individual sounds for make them prominent at the syntagmatic or paradigmatic level, and the lenitive, which makes the pronunciation of certain sound sequences more efficient, although Oñederra (2019) stated that a case like "*ez da* [esta] 'not leave'" (p. 69) indicates that this class of processes could also optimize the recognition of some sound sequences in contrast to vowels, at least, in some occasions. Figure 1 summarizes these clarifications about sound alternation classifications and adds some examples for each postulated type.
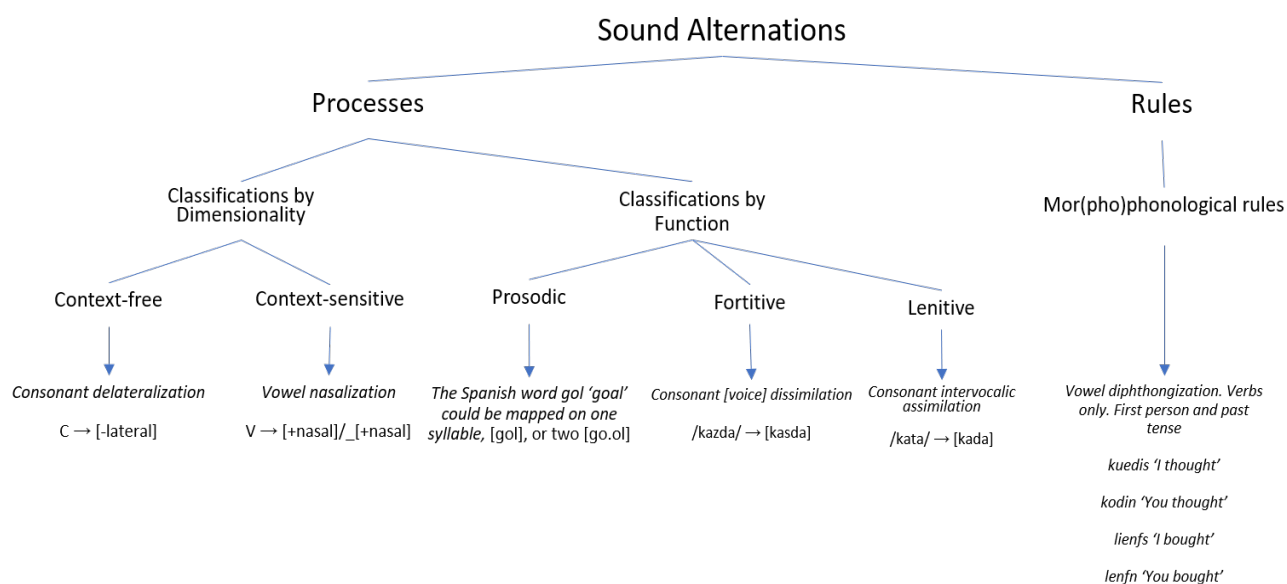
Figure 1. *Classifications of sound alternations based on Stampe (1979) and Donegan and Stampe (1979).*

This proposal was questioned by Anderson (1981), who considered that the separations between processes and rules were not necessary due to all the sound alternations, insofar as they were motivated by forces of articulation and hearing (*i.e.* the essence of phonological processes), were absorbed by learning processes, since they were not subject to an universal grammar (syntactic knowledge), which is what is considered "innate" in their position. However, Churma (1985) refuted this position of simplifying and subordinating a sound alternation to a phonology that is exclusively dependent on rules. For this, he reiterated that the most "innate" issue, which separates the processes from the rules in the terms of Donegan and Stampe (1979), are the difficulties of producing and recognizing some sounds before others (*e.g.* no one is born producing sequences of sounds with implosive consonants followed by nasalized vowels with a crackling voice, but, after a few months after birth, a person can babble by contrasting voiceless consonants with vowels) along with impossibilities (*e.g.* voiced glottal stops or pharyngeal lateral fricatives), which they can be recognized from the different processes of language acquisition by infants. Anderson's biases of cutting down on everything and looking for forced innateness in the syntax made him confuse what is really learned, which are the rules, and which are linked to questions of lexicon and morphology, compared to what is automatic, which is phonological:

> "What Anderson has actually done is argue (and demonstrate, I feel) that what Donegan and Stampe would call morphonology is not natural […] Anderson has succeeded in demolishing his straw man, but the non-effigy is still very much alive; at least in the area of allophonics (and probably in al lof automatic phonology), phonology, contrary to Anderson, <u>is</u> natural. Moreover, if we accept the distinction between phonology and morphology, we can maintain that <u>all</u> of phonology is natural" (Churma, 1985, p.35).

3. THE GRADUALNESS OF THE SOUND ALTERNATIONS IN NATURAL PHONOLOGY

Stampe (1985) nuances the issue of active or suppressed processes, making it clear that it is a gradual issue. A representative example is the fact that there may be degrees of auditory recognition of lexical items in both phonemic and morphophonemic terms, which corresponds to transitions that could exist between first and second category alternations in Kruszewski terms, or, in Donegan and Stampe (1979) division terms, cases of process deletions that may entail nexus with morphemic meaning constraints:

> "Unless all the variants and "automatic" alternants of a form have the same phonemic representation, the form in its lexical representation must be represented morphophonemically, or its variants and

alternants will not at all be derivable from that representation. Thus, although <u>water</u> is pronounced [wɑtɾ̩], i.e. /wadɾ̩/, its occasional variants [watɾ̩] and [wɑɾɾ̩], i.e. /watɾ̩/, could not be derived from |wadɾ̩|, and so it is derived from |watɾ̩| instead, as is confirmed by its pronunciation in Ob, [wɑbɑt̪abɾ̩]. Since /t/ as well as /d/ is a phoneme of English, this is still a representation entirely in terms of phonemes" (Stampe, 1985, p.139).

Hurch (1994; 1996) emphasizes that the gradualness of the suppression of a phonological process not only operates with phonemic and morphophonemic scopes, but also between the prosody and the morphoprosody, where an accentual arrangement can trigger links with questions of morphological restriction at various stages of the sound production of lexical items when interacting with segmental constituents.

> "What I understand here as the graduality of morphoprosodic rules will reflect a rather functional view of the gradual fulfillment of morphological requirements by accent rules which are inherently prosodically deviant. The functionality of this deviancy, moreover, points to the fact that prosodic processes, like segmental ones, are not applied only as a set of changes in a chronologically "last" component of grammar but, as seen held throughout classical Natural Phonology, work during the whole grammatical derivation" (Hurch, 1996, p.76).

Donegan and Stampe (2009) establish gradualness as the nuances of activity of the processes that are updated by the behaviors and moods of the speakers in real time, promoting variability in the production and perception of different utterances:

> "Because they apply in real time and are sensitive to speech rate and other real-world circumstances (like fatigue, drunkenness, objects in the mouth, injuries, etc.), processes are variable. Optional processes represent articulations over which the speaker has less-than-perfect control, so that special conditions – such as fast tempo, or lack of attention or care, or situations of high redundancy, or very frequent words – can affect their application. Inhibitions may be relaxed so that lenitive processes apply more freely" (Donegan and Stampe, 2009, p.10).

Donegan and Nathan (2015) report the gradualness between process and morphonological rule at historical level, where they make it clear that the loss of recognition of phonetic motivations in synchrony is the main trigger for the recognition of a sound alternation as part of a field of morphological knowledge by the speakers:

> "It is this conventionality that pushes the alternation into the grammar (the morphonology), even if it remains 'productive' to some degree. Alternations that become unrecoverably opaque often develop morphological conditions (so the alternation only applies with certain affixes, to certain word classes, at morpheme boundaries, etc.). But neither opacity alone nor morphological conditioning alone is the crucial distinction. Morphological conditioning is an *indicator* that an alternation is rule-governed rather than process-governed. Morphological conditioning does not define conventionality; the loss of synchronic phonetic motivation does this" (Donegan and Nathan, 2015, pp.433-434).

4. The sound-symbolic/sound-iconic and pragmatic-circumstantial aspects in the gradualness of sound alternations

The gradation of the sound alternations could even provide a space for situations where there is suppression of processes, but it cannot be said that accompanied by fully delimited morphological restrictions, which have arisen such as verbal properties (*e.g.* time, aspect) or particular nominal properties (*e.g.* internal sandhi gender or case), or phenomena of contact between lexical items (*e.g.* cases of external sandhi), thus there is a space for other sound alternations restricted by meanings of a pragmatic-circumstantial (Kochetov and Alderete, 2010) or sound-symbolic/sound-iconic (Perry, 2010) criterion.

Respect to the sound-symbolic/sound-iconic criterion, the case of palatalization in Basque comes from two different sources of sound alternation: the first is a contextual lenitive phonological process of contiguous

and anticipatory consonant assimilation from /i/ vowel to the onset of the next syllable, "*hil-eta* [i.ʎe.ta] 'funeral', *jakin-a* [xa.ki.ɲa] 'known', *dadi-la* [da.ði.ʎa] 'let it be'"(Iverson and Oñederra, 1985, pp.51-52), "*pisu* [piʃu] 'flat', *edukitu* [ewkitʲu] 'to have'" (Oñederra, 1986, p.73). The second is a rule that carries an iconic representation of similarity between closeness or smallness and a greater narrowing of the oral canal due to the tongue raising in the palatal vowel, "*tanto* [tanto] 'drop', [tʲaɲtʲo] 'small drop'; *goso* [goso] 'sweet', [goʃo] 'sweet, warm, cozy'" (Iverson and Oñederra, 1985, pp.54-55).

In Spanish spoken in Colombia, although there is no information on palatalization as an active phonological process, as previously observed in Basque, there are reported situations in which, to make fun of the negative behavior of a person with certain social, political, economical or political power, people take a statement that was originally said by the questioned person and they tend to replace all different vowels with only palatal vowels. An example of this is found in this meme in figure 2, in which the questioned person says *yo no hablo así* 'I don't speak this way' and the other person uses the vowel palatalization in a sarcastic way imitating the statement, but only with samples of /i/ vowel.

Figure 2. Example of a sarcastic or humorous palatalization about yo no hablo así 'I don't speak this way'. Based on a meme that was produced in memegenerator (2019).

Taking into account the above, it could be considered that the sound alternations in 2021 should be seen as a continuum that exists between the case of active phonological (prosodic, fortitive, lenitive) processes on an extreme, corresponding to the first category of Kruszewski (red square), passing through a gradualness of the suppression of these, which can lead to Kruszewski's second category (green square), which is now significantly nuanced and oscillates between non-morphological semantic restrictions, as would be the case of sarcastic uses of sound alternations or sound-symbolic phenomena, followed by more stable semantic restrictions in strict morphonology, whether they affect lexical morphemes, grammatical morphemes, or contact between morphemes or lexical items in specific syntactic circumstances. The third type alternation (purple square), in the other extreme, would be the manifestation of a total suppression of phonological processes without being able to identify any phonetic factor of them in synchrony. The intersection among squares indicates possible coexistences of more than one sound alternation within a language (cf. the previous case of Basque mentioned above). Figure 3 illustrates this situation with examples of different palatalization possibilities that could be documented.
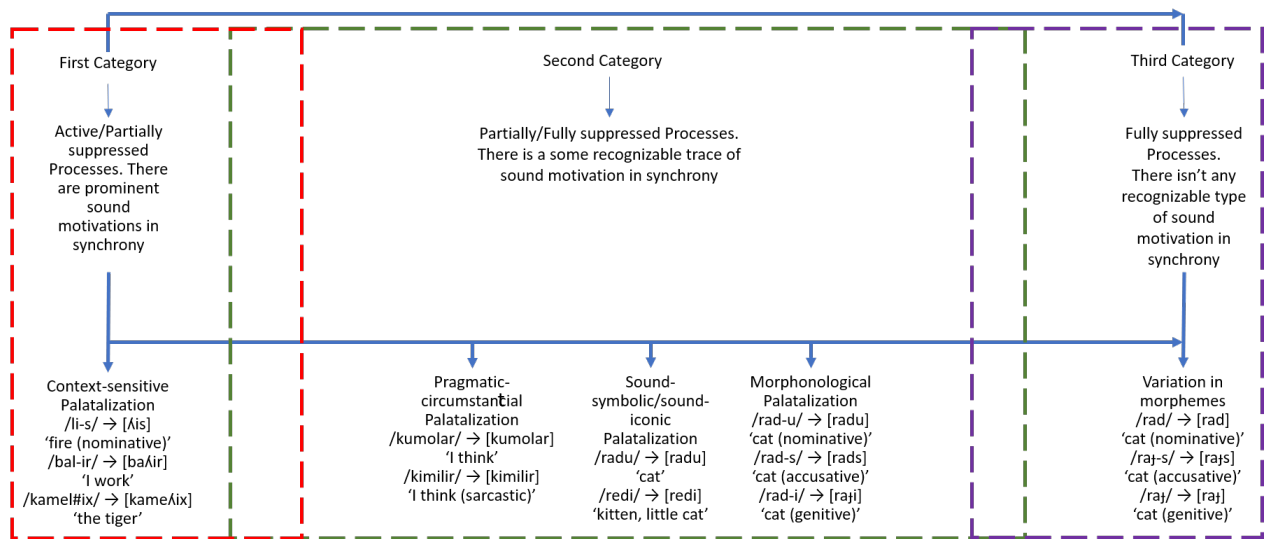
Sound Alternations Continuum

Figure 3. *Sound Alternations Continuum in 2021.*

5. RESEARCH PERSPECTIVES IN LATIN AMERICA

In the context of Latin America, there have been observations about the sound alternations in binary terms of activation or suppression of phonological processes for topics such as stages in first language acquisition, the comparison between sound systems without georeferentiation and in Spanish dialectology (Pavez *et al.*, 2009; Coloma *et al.*, 2010; Díaz, 2019; Silvestre, 2020).

Currently, different efforts have been made to recognize the gradualness in the suppression of phonological processes in situations such as languages and communities in contact, as happened in the school context of bilingual Embera-Spanish adolescents living with monolingual Spanish speakers (Sáenz, 2021), and the project *Atlas Tipológico de Alternancias Sonoras de las Lenguas Indígenas de Colombia* (*ATASOLICO*. Engl. Typological Atlas of Sound Alternations of Indigenous Languages of Colombia), which has been under development since the beginning of 2021 and may generate a good precedent for future developments of areal phonological typology in other countries of the region (Peru, Ecuador, Costa Rica, Bolivia, etc.).

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