THE TOPOGRAPHY OF CERTAIN PHONETIC AND MORPHOLOGICAL CHARACTERISTICS OF SOUTH EAST ASIAN LANGUAGES

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In the deliberations of the study group that was the forerunner of the present conference one of the matters that arose upon which there appeared to be the most widespread agreement was the need for more typological studies at all levels – phonological, morphological, syntactic and lexical – of the languages of the Indo-Pacific area. Warnings that such studies should in the first instance be carried out without regard to their correlation with accepted genetic groupings were sounded by several scholars (Robins, Uhlenbeck), but hopes were expressed by others (e.g. Shorto, Simmonds, Egerod) that it would prove possible ultimately to effect a connection between typological and historico-genetic statements. In view of such general interest it is perhaps disappointing (though not surprising to those familiar with the difficulties), that there should be so few 'pure' typological studies among the contributions to this conference. Typological material there is, however, in plenty, used sometimes as a means of inferring sub-groups within larger groups of languages whose genetic relationship is hardly to be disputed, and sometimes, more controversially perhaps, as ancillary evidence of genetic relationship alongside the more orthodox evidence supplied by regular correspondences in basic vocabulary. It is clear that many scholars are still not inclined to take too seriously Robins' warning that 'inference from one type of comparison to the other are not necessarily valid' and that 'it is illicit to exploit the criteria applicable to synchronic comparison to produce or even to buttress historical genetic groupings'.[1])

It is the paucity so far of studies in the present collection devoted to typological treatment for its own sake that prompted me to put together the present paper. The time limits within which the materials had to be assembled meant that by no means all relevant authorities were consulted,

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[1]) R. H. Robins, 'Linguistic comparison', *LCSEAP*, 9–10.

and it is my sincere hope that criticisms, corrections and additions will be forthcoming from participants to the conference and from other colleagues.[2])

My own concern with the languages of the area has been as a phonetician and general linguist and has therefore been primarily with synchronic description rather than with historical hypotheses. In the course of investigations extending over many years into the present phonological and grammatical structure of a variety of languages on the South East Asian mainland, my attention has, however, inescapably been drawn to a number of features which suggest themselves as characteristic of the area, or of sub-areas within the larger area. The extent to which such characteristics coincide with or cross accepted language-family boundaries and the conclusions to be drawn from such coincidences or crossings are matters I am content to leave to my historically orientated colleagues to decide. It is my purpose here merely to suggest what requires to be done in the way of synchronic comparison before reliance can be placed upon statements as to what features can or can not be borrowed from one language to another, or upon the theoretical assumption that some features (e.g. grammatical) are less subject to change and less likely to be borrowed than others (e.g. phonetic).

Among the features which have suggested themselves as typologically characteristic of a South East Asian linguistic area, or of smaller areas

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[2]) I particularly regret and apologize for inability to take into account more than a fraction of the wealth of material new to me that has been incorporated in the other papers to the conference, as for example in those of Li, *IPLS*, 1, Morse, *IPLS*, 2, Constantino, *IPLS*, 2, Lopez, *IPLS*, 1-2. Time and space have also prevented me from including relevant data from the large amount of unpublished but invaluable firsthand material on the lesser known languages of Burma recently made available to me by Professor G.H.Luce, and from the interesting recent work on typology in the area by Russian scholars, notably V.M.Solntsev: 'Typological Characteristics of Isolating languages' (paper submitted to the 26th Int. Congr. Orient., Delhi, 1964), and two papers contained in: *Languages of China and South East Asia*, Moscow, 1963: Solntsev, Rozhdestvenskiy et al., 'Some general features of Sino-Tibetan and typologically close South East Asian Languages', and Y.A.Gorgoniev, 'The position of Khmer amongst the languages of South East Asia'.

I have, however, taken advantage of the kindness of Professor Egerod in supplying me with an advance copy of an article on Atayal phonology still in the press, to fill in tentatively the Atayal square in my maps. In the course of the conference further information was also received from the following: R.L.Phillips of Cornell, via R.B.Jones (Mnong Bunar, Hrê-Sedang, Vietnamese etc.); L.C.Thompson (Vietnamese); I.Dyen (Javanese); G.Condominas (Mnong Gar, Bahnar); A.Haudricourt (New Caledonian).

within it, and in some instances of larger areas in which the South East Asian linguistic area might be included, are the following:

1. *The presence or absence of 'tone'*, and its correlation with (a) initial consonants, (b) vowel quality, (c) vowel quantity, (d) final consonants, (e) phonation-type, and (f) its use for grammatical, as opposed to lexical, purposes.

2. *The presence or absence of 'register'*[3]) and its correlation with (a) initial consonants, (b) phonation-type, (c) pitch.

3. *Initial consonant patterns and their distribution*, with special reference to the use made of (a) aspiration distinctions, (b) the voice/voiceless distinction (or alternatively the fortis/lenis distinction), (c) retroflexion, (d) 'preglottalization', (e) 'prenasalization', (f) the distinction between a velar and uvular series of initial consonants, (g) the various initial fricative patterns, (h) the various initial nasal patterns, (j) initial clustering patterns (this latter inextricably bound up with syllabification patterns – see below); (k) the grammatical use made of any of these.

4. *Syllabification patterns*, i.e. the comparative structures of 'tonic' and pre-tonic or post-tonic syllables, or 'major' and 'minor' syllables,[4]) and the permitted combinations of these. Of particular interest here are the relations of the various initial clustering patterns to the restrictions in the permitted initials of pre-tonic syllables as against those of tonic syllables, and to the permitted sequences of pre-tonic and tonic initial consonants. These seem to me to be of prime importance to the understanding of the phonological structure of syllables and 'words' in the area, though the only attempt at a detailed analysis along these lines so far appears to be that by Uhlenbeck for Javanese.[5]) Linked to the study of syllabification patterns is that of affixation, i.e. the grammatical use of pre- and post-tonic minor syllables, whether as prefixes, infixes or suffixes.

5. *Vowel systems* with special reference to (a) the incidence and distri-

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[3]) For the term 'register', see Eugénie J. A. Henderson, 'The main features of Cambodian pronunciation', *BSOAS*, 14, 1, 1952. In that paper 'voice quality' is named as the salient phonetic characteristic of 'register'. In a forthcoming book on general phonetics Professor David Abercrombie of Edinburgh accepts 'register' as an appropriate phonological term but suggests that 'phonation-type' is a more suitable term for its phonetic realization, thus reserving the expression 'voice quality' for more general use. This seems to me a valid and useful distinction and one which I have accordingly adopted in this paper.

[4]) For the terms 'major' and 'minor' syllable, see Henderson op. cit., and H. L. Shorto, 'Word and syllable patterns in Palaung', *BSOAS*, 23, 3, 1960.

[5]) E. M. Uhlenbeck, *De structuur van het Javaanse morpheem* (VBG, 78), Bandoeng, 1949.

bution of back unrounded vowels, (b) the vowel length distinction, (c) diphthong patterns, (d) correlation of vowels with initial consonants, final consonants, tone or register, (e) 'vowel-gradation', i.e. the grammatical role of vowel quality differences.

6. *Final consonant patterns and their distribution*, with special reference to (a) incidence of final palatals, (b) use of the voice distinction finally, (c) final 'clusters', (d) the grammatical use of final consonants.

On the grammatical and syntactic levels also there are characteristic features which might provide interesting isoglosses, as has been remarked by a number of scholars.[6]) It is necessary here, however, to restrict both the number of features and the number of languages examined, and in this paper I propose to restrict myself to a provisional preliminary glance at the distribution of a mere handful of phonetic features over a range of 59 languages only.

The 59 languages examined are listed by number in the key on page 406 and alphabetically on page 407. The arbitrary nature of their selection should be noted. My preference, derived both from professional training and experience, would be to present only material of which I have first-hand personal knowledge, since, though this may be fallible, one may at least suppose the same bias to run through the whole of it. As my own first-hand experience has been confined to a mere sprinkling of languages on the South East Asian mainland, however, (a fact which is clearly reflected in the maps that follow), I feel that to serve any useful purpose I must cast my net somewhat wider than this to include at any rate some of the Austronesian languages and certain other languages that may be regarded as peripheral to the South East Asian area geographically. I have accordingly ventured, though very tentatively only, to draw upon material contained in the writings of colleagues and participants of this conference, to whom I apologize for any misinterpretations that may have arisen.

The difficulties inherent in using other people's material were pointed out to us last time by Uhlenbeck: 'As language typology can only be carried out satisfactorily if there is similarity in descriptive techniques, it will be necessary to reach a certain minimum of agreement on, or at

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6) E.g. M.B.Emeneau, 'India as a linguistic area', *Language*, 32, 1, 1956; P.J.Honey and E.H.S.Simmonds, 'Thai and Vietnamese: Some elements of nominal structure compared', *LCSEAP*; R.H.Robins, op. cit.; and Hla Pe, and L.C. Thompson on pp. 167, 185, and 29 respectively in this volume.

least a mutual understanding of, the techniques used."[7]) It is clearly
'preposterous', as Bazell has said, to demand 'neutral descriptions based
on agreed criteria identical from linguist to linguist, and from the de-
scription of one language to that of all others' and attempts to pursue the
selected 'features' through the descriptive accounts of other writers have
convinced me of the justness of his view that phonology is a 'most
unfavourable domain' for typology, 'for here linguists tend to diverge in
their criteria of relevance, so that a feature which is present in the material
for one is for the other virtually non-existent.[8])

It might be supposed, for instance, that it would be a relatively easy
matter to decide whether a language is 'tonal' or not, but consideration
of linguistic descriptions in our area shows that this is not the case.
Difficulties arise because 'tone' is seldom, if ever, a matter of pitch alone.
There are very frequently concomitant features of phonation-type, glottal
constriction, stress, etc. which pose problems of interpretation and
definition. Similarly, the characteristic phonation-types of 'register'
languages such as Mon and Khmer may be accompanied by, or perceived
as being accompanied by,[9]) concomitant pitch features. It is necessary,
therefore, to be more precise and to define the feature we are examining
as 'lexically contrastive pitch' rather than 'tone', or as 'lexically contrastive
phonation-type' rather than 'register', if we are to hope to make valid
comparisons of the material available. Even so, we shall, of course, be at
a loss if the author of the material under examination has not found it
necessary for his purposes to note such a feature as phonation-type.
Similar difficulties arise with regard to phonemic accounts of languages
unless accompanied by a detailed description of allophonic variants. One
man's unit phoneme may be another man's cluster; one man may for
reasons of 'economy' use a symbol usually associated with a voiced sound
to denote a voiceless one; another whose concern is to 'get on with' the
grammar as soon as possible may give no account at all of the phonetic
values to be attached to his symbols. Contrary, perhaps, to general
belief, a phonological description much manipulated in the name of
'economy of phoneme inventory' or 'pattern congruity' within the language

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[7]) E. M. Uhlenbeck, 'The comparative study of the Austronesian languages',
LCSEAP.

[8]) C. E. Bazell, *Linguistic typology* [inaugural lecture], London, 1958.

[9]) Laboratory experiments with Khmer suggest that the perceived 'lower pitch' of
chest register syllables does not always correspond to physical fact as measured in
terms of fundamental frequency.

concerned may be far less suitable for comparative purposes than one more firmly anchored in similarities of phonic substance or, indeed, in a well-ordered and accurate phonetic description in general terms. Fruitful comparison cannot, however, be made entirely in phonic terms without regard to context and function. Languages which make no lexical use of the distinction between aspirated and unaspirated sounds may nevertheless contain both, phonically speaking; languages which voice utterance-medial plosive sounds in rapid speech may only employ voiceless plosives in other contexts. What is needed therefore, is comparison in what may be called 'pre-phonological' language, in terms of 'prospective phonemes' and the like[10], in the expectation that it is precisely towards those parts of the material that give rise to problems of interpretation that our attention may most usefully be directed.

A further problem relates to what has been called the 'recognition of different strata within one language with different genetic affiliations.'[11]) It is clear that when such strata are thoroughly integrated into a given language, a synchronic account of that language will include all phonetic and morphological characteristics, whether or not they are to be found in the deepest layer of all. Doubt may arise, however, when certain features appear to be confined to a very small number of obvious loanwords, or to special styles of utterance, or to a small section of the community. It is important that note should be taken of any special restrictions, since sounds or other features subject to them may be the harbingers of future innovation or the survivors of patterns elsewhere obsolete, thus marking the advance and retreat of specific isoglosses.

It is proposed to examine in turn the distribution over the selected languages of the following phonetic features:

Lexically contrastive pitch

Lexically contrastive phonation-type

Lexically contrastive aspiration of initial plosives

Lexically contrastive voicing of initial plosives

Lexically contrastive retroflexion of initial plosives

Lexically contrastive preglottalization of initial plosives

Lexically contrastive prenasalization of initial plosives

Lexically contrastive final consonants.

It is proposed also to look briefly at some of the interrelationships

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[10]) Cf. Bazell, op. cit., 19.
[11]) Robins, op. cit.

between these features, and to note the languages in which they have a grammatical, i.e. morphological, as well as a lexical function to perform.

Initial plosives are selected as representative of the initial consonant systems in the area, since to handle all types of initial consonantal possibilities would overload the present paper. Clusters including plosives are excluded for the reason given on p. 404. The palatal type affricates (*c*, *ch*, etc.) are also excluded since they cannot be handled profitably without the discussion of clustering patterns.

The distribution of the selected features is shown diagrammatically by the appropriate marking of a square on the relevant map. A number key to the language squares on the maps is provided below. It is pointed out that both the number, location and size of squares has been dictated to a large extent by purely practical considerations of space and of ease of reproduction. The size of the squares and their position on the map has only a very rough-and-ready correlation with the geographical location and importance of the languages concerned. The general direction of the fringe languages to the north, east and west is indicated by arrows pointing to the relevant squares.

NUMERICAL KEY TO LANGUAGES

1. Mandarin
2. Cantonese
3. Hakka
4. Tibetan (Lhasa)
5. Limbu
6. Lepcha
7. Gurung
8. Boro
9. Naga (Angami)
10. Burmese
11. Khyang
12. Marma
13. Northern Chin (Tiddim)
14. Central Chin (incl. Lushai)
15. Kachin
16. Northern Karen (Taungthu)
17. Central Karen (Bwe)
18. Southern Karen (Pwo, Sgaw)
19. Central Thai (Siamese)
20. Lao
21. Shan
22. Southern Thai (Songkhla)

23. Northern Vietnamese (Hanoi)
24. Central Vietnamese (Hué)
25. Southern Vietnamese (Saigon)
26. Miao (White)
27. Yao (Highland)
28. Mon
29. Palaung
30. Riang-Lang
31. Khmer (Cambodian)
32. Hrê/Sedang
33. Bahnar
34. Mnong/Srê
35. Khmuʔ
36. Stieng
37. Cham
38. Chrau
39. Rhadé/Jarai
40. Malay
41. Minangkabau
42. Sundanese
43. Javanese
44. Sea Dayak

45. Land Dayak
46. Tagalog
47. Atayal
48. Khasi
49. Northern Indian (Indo-Aryan)
50. Munda
51. Dravidian
52. New Guinea languages

53. Kapingamarangi
54. Fijian
55. Samoan
56. Gilbertese
57. Ellice
58. Rarotongan
59. New Caledonian

ALPHABETIC KEY TO LANGUAGES

	Square		*Square*
Angami Naga	9	Limbu	5
Atayal	47	Lushai	14
Bahnar	33	Malay	40
Boro	8	Mandarin	1
Bwe Karen	17	Marma	12
Burmese	10	Miao (White)	26
Cambodian	31	Minangkabau	41
Cantonese	2	Mnong	34
Cham	37	Mon	28
Chin (Central)	14	Munda	50
Chin (Northern)	13	Naga (Angami)	9
Chinese (Cantonese)	2	New Caledonian	59
Chinese (Hakka)	3	New Guinea languages	52
Chinese (Mandarin)	1	Palaung	29
Chrau	38	Pwo Karen	18
Dayak (Land)	45	Rarotongan	58
Dayak (Sea)	44	Rhadé	39
Dravidian	51	Riang-lang	30
Ellice	57	Samoan	55
Fijian	54	Sedang	32
Gilbertese	56	Sgaw Karen	18
Gurung	7	Shan	21
Hakka	3	Siamese	19
Hrê	32	Songkhla	22
Indo-Aryan (Northern Indian)	49	Srê	34
Jarai	39	Stieng	36
Javanese	43	Sundanese	42
Kachin	15	Tagalog	46
Kapingamarangi	53	Taungthu Karen	16
Karen (Central)	17	Thai (Central)	19
Karen (Northern)	16	Thai (Southern)	22
Karen (Southern)	18	Tibetan (Lhasa)	4
Khasi	48	Tiddim Chin	13
Khmer	31	Vietnamese (Central)	24
Khmuʔ	35	Vietnamese (Northern)	23
Khyang	11	Vietnamese (Southern)	25
Lao	20	Yao (Highland)	27
Lepcha	6		
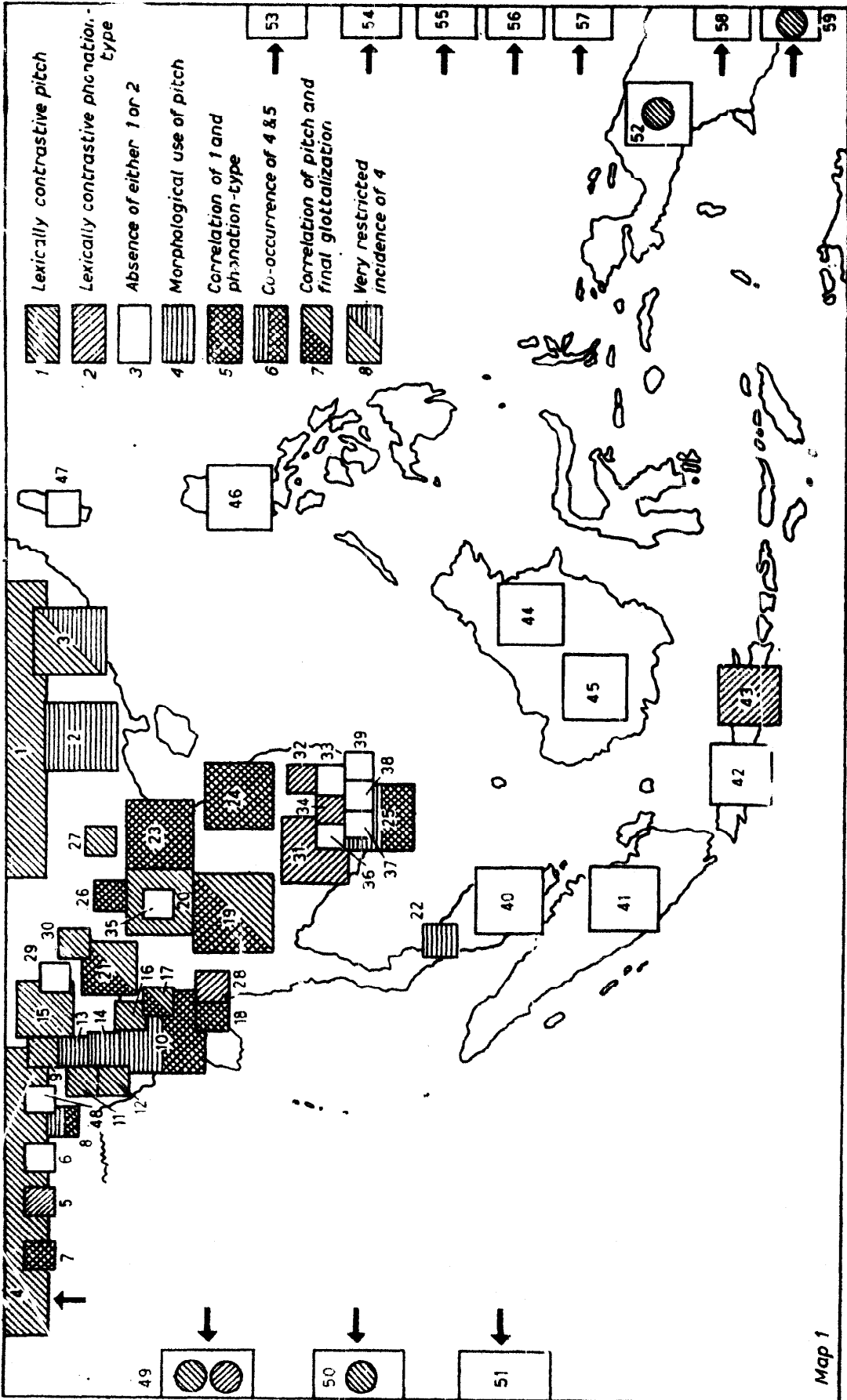
Map 1. Lexically contrastive pitch and phonation-type (see pp. 409-413)

MAP 1 – LEXICALLY CONTRASTIVE PITCH AND PHONATION-TYPE

1.1. *Lexically contrastive pitch*

Little doubt is likely to be raised over the majority of languages marked in the map as having this feature, but Lepcha illustrates some of the difficulties that may arise.

I understand from Mr. R. K. Sprigg that Professor Bodman of Cornell is inclined to regard the language as tonal. Sprigg reports however, that there are 'no pitch or register distinctions in verb or particle forms, or in monosyllabic nouns, but in *dissyllabic* nouns pitch differences are co-articulated with stress differences as follows:

'i. [. ⌐] [. \] Final stress + high pitch; initial non-stress + low pitch.
'ii. [⊥ ·] [\ .] Initial stress + high pitch; final non-stress + high/low pitch.

'Type ii is much the less frequent, and includes (high-tone) loanwords from Tibetan, together with a number of 'contrastive' nouns, e.g. *róng-kúp, tsong-kúp, lum-kúp* (= 'Lepcha', 'Limbu', 'Nepali'), *sung-kung, rip-kung, tung-kung* (different kinds of tree).

'A few loanwords show, but erratically, a pattern [__ ·] (iii), e.g. *wo-mo* (Tib. low-tone *wa-mo* 'fox'), *lal-krin* [laltin], = English 'lantern', but I think they are not consistent enough to be taken seriously.

'If one did opt for tone rather than stress such examples as the following would make difficulties:

'(i) ['zoːbɪ] [\ __] 'meal' (rice and vegetables), (ii) [zoˈliː] [__ \] 'rice shoot'. ['zoː/zo] would have to be high-tone in (i) but low tone in (ii); and yet, apart from stress, the environment is the same (first syllable of a disyllabic noun). One would have to introduce stress to make a tone analysis work; then why not be content with stress alone, the pitch features being correlated in a one-to-one relationship?'

A further problem is raised by such languages as Mon and Srê, both of which Pinnow designates as tone languages,[12] although Mon is not, to my way of thinking, characterized by lexically contrastive pitch. Smalley's account of Srê describes a pitch feature correlated with length, but sides against pitch as the contrastive feature *unless* 'conscious Vietnamese loans' have to be taken into account, thus raising the important problem of the extent to which loans *should* be taken into account and of how one is to define a 'conscious' loan.[13]

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[12] See H. J. Pinnow, 'Personal pronouns in the Austroasiatic languages: a historical study', *IPLS*, I.
[13] Cf. W. A. Smalley, 'Srê phonemes and syllables', *JAOS*, 74, 1954. In a personal

The hatched circle within the New Guinea square relates to Yabẹm/ Bukawac‘ in North West New Guinea,[14]) that within the New Caledonian square to Patyi (and possibly others) as reported by Haudricourt.[15]) The circle hatched for lexically contrastive pitch within the Northern Indian square draws attention to the tonal features reported for Panjabi, and possibly other North Indian languages,[16]) that within the Munda square is tentatively for the 'tone' reported by Zide for Korku.[17])

1.2. *Lexically contrastive phonation-type*

There are a number of doubtful areas here since this feature has frequently been ignored in published material or described in terms that are difficult to interpret phonetically. I believe that the feature is far more widespread than has hitherto been recognized. I am unable to discover from available published data consulted whether lexically contrastive phonation-type is to be stated for the Cham, Chrau, Stieng etc. group in South Vietnam but suspect that this may be the case, for some of them at least.[18]) Javanese is shown as having contrastive phonation-type on the strength of statements by Catford[19]) and of Eleanor Horne's description of the 'murmured, fuzzy quality' of the 'heavy' consonants (i.e. those she writes *b, d, ḍ, dj, g* and *lh*).[20])

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communication at the conference M Condominas gave it as his view that since the pitch features described by Smalley are clearly phonetically conditioned they are not to be regarded as lexically contrastive in any case.

[14]) See A. Capell, 'Two tonal languages of New Guinea,' *BSOAS,* 13, 1, 1949.

[15]) See A. G. Haudricourt, 'The languages of New Caledonia', *LCSEAP.*

[16]) Cf. J. R. Firth, 'Phonological features of some Indian languages', *Proc. 3rd Int. Cong. of Phon. Sciences,* London, 1935; T. Grahame Bailey, 'The Sindhi Implosives', *BSOS,* 2, 4, 1923.

[17]) Cf. N. H. Zide, 'Final Stops in Korku and Santali', *Indian Linguistics,* Turner Jubilee volume, 1, 1958. I am not clear whether what Zide regards as 'tone' in Korku is to be referred to lexically contrastive pitch or lexically contrastive phonation-type. Certainly the phenomenon he reconstructs for Proto-Munda in his contribution to this conference sounds very much like 'register' (see his paper, 'Gutob-Remo vocalism and glottalised vowels in Proto-Munda', *IPLS,* 1).

[18]) This has now been confirmed by information received personally at the conference from R. B. Jones, and, indirectly, from R. L. Phillips. It seems quite clear from what they tell me that from the phonetic point of view contrastive phonation-type is present in Hrê, Sedang, the Mnong dialects, Jeh, Brou and, possibly, Bahnar. In some of these the statement of 'register' at the phonological level appears self-evident, but since there is always a certain correlation with differences of vowel quality and sometimes (e.g. in Mnong) with the preceding consonant, differences of phonemic treatment might suggest themselves.

[19]) See J. C. Catford, 'Phonation Types' in: *In Honour of Daniel Jones,* ed. D. Abercrombie et al., London, 1964.

[20]) Elinor C. Horne, *Beginning Javanese,* New Haven. London, 1961, xxix: 'The

The circle hatched for contrastive phonation-type in the Northern Indian square relates to Gujarati, as reported by Firth and Pandit.[21])

1.3. *Morphological use of pitch*

An attempt has been made in the map to designate which of the languages which use pitch contrasts lexically also do so morphologically, i.e. to make grammatical as well as lexical distinctions. One may cite as instances the extensive use made of tonal alternation in the verb in Chin, in related pairs of noun and verb in Cantonese, in certain forms in Southern Vietnamese[22]) and in attributive constructions in Burmese. As regards the latter, however, it should be pointed out that Sprigg maintains that in such cases as *eiŋ' fiŋ* 'householder' as contrasted with *eiŋ* 'house', it is phonation-type rather than pitch which expresses the grammatical relation.

The special hatching for Hakka records the fact that in this language the morphological function of pitch is restricted to certain uses of the first person pronoun. Tibetan should perhaps be similarly marked, since Sprigg reports three instances in which it might be said that pitch contrast is playing a grammatical role.

1.4. *Correlation of contrastive pitch and phonation-type*

In many of the languages of the area certain tones are regularly associated with a given phonation-type, as, for example, in Northern Vietnamese, the hỏi' tone with 'breathy' phonation, the 'ngã', and frequently the 'nặng',[23]) tone with 'creaky' phonation, and so on. The distribution of such languages, as contrasted with languages in which there appears to be no such regular association, is shown on the map. In

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light consonants are sharp and clear, while the heavy consonants have a murmured, fuzzy quality. In addition, the heavy consonants affect the vowel after them by making it a bit lower in pitch and giving it a breathy sound'.

At the conference Professor I. Dyen confirmed personally that there is in Javanese a contrast of phonation-type of the kind under investigation here.

[21]) See J. R. Firth, 'Phonetic observations on Gujarati,' *BSOAS*, 20, 1957, and P. B. Pandit, 'Nasalization, aspiration and murmur in Gujarati', *Indian Linguistics*, 17, 1957.

[22]) See Eugénie J. A. Henderson, 'Tonal exponents of pronominal concord in Southern Vietnamese', *Indian Linguistics*, 22, 1961, and R. B. Jones and H. S. Thong, *Introduction to spoken Vietnamese*, Washington, 1957, 17, 29, 120–121. Cf. also the 'subsyllabic morphemes' referred to by Thompson in his paper 'The problem of the word in Vietnamese', *Word*, 19, 1, 1963.

[23]) For the absence of 'creaky voice' in syllables with final stops see Jean Donaldson, 'A study of the "nặng" tone in the northern dialect of Vietnamese', *Van-Hoa Nguyet-San*, 12, 7, 1963.

some cases there is a partial correlation in that certain tones are associated with marked glottal constriction or with a final glottal stop at the end of the syllable rather than with 'creaky' phonation of the syllable as a whole. Here one may cite as examples the high and the falling tones of Central Thai (in pre-pause position), the low level, high level and falling tones of Shan,[24]) the mid and low tones of Bwe Karen,[25]) and the 'abrupt' tone of Burmese. Since it is precisely in cases of this kind that differences of opinion may arise as to whether the final glottal element is to be regarded as 'consonantal' or not,[26]) it has been thought useful to distinguish them on the map from, on the one hand, those languages in which there is no comparable feature and, on the other, those in which the correlated phonation-type runs through the whole syllable. Languages like Burmese and Southern Vietnamese which associate some tones with a characteristic phonation of the whole syllable, others with final glottalization only, are for convenience marked as of the former type.[27])

It is possible that in some of the languages marked as having lexically contrastive phonation-type, the phonation-type should be regarded as having optional concomitant pitch features.

1.5. *Co-occurrence of the correlation of contrastive pitch and phonation-type and of the morphological use of pitch*

Burmese, Southern Vietnamese and Boro are cited as examples here.[28]

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[24]) See S. Egerod, 'Essentials of Shan phonology and script', *Bulletin of the Institute of History and Philology, Academia Sinica*, 29, 1957.

[25]) Note that the high tone in Bwe is associated with a final breathy off-glide in pre-pause position, never with the glottal stop.

[26]) Cf. the treatment of Karen in R. B. Jones' *Karen linguistic studies*, and his detailed discussion of the association of tone and glottal constriction in Thai dialects in his contribution to this conference, 'On the reconstruction of Proto-Thai', *IPLS*, 1.

[27]) As L. C. Thompson has pointed out, the 'nặng' tone in Southern Vietnamese is not characterized by 'creaky' phonation throughout, as in the north, but by a final glottal constriction; but since, according to my personal notes, the 'hỏi' (or 'ngã') tone in that dialect is accompanied by breathy phonation, Southern Vietnamese is marked on the map as correlating contrastive pitch and phonation-type.

[28]) Unless, of course, one adopts Sprigg's view that phonation-type is the contrastive feature in Burmese attributive constructions (see p. 411 above), in which case Burmese would stand alone in the area as making grammatical as opposed to lexical use of phonation-type contrasts. It may be remarked in passing that the grammatical use of contrastive phonation-type is quite common in some other parts of the world, e.g. in parts of East Africa and the Sudan.

1.6.   *Correlation of contrastive pitch and phonation-type with initial and final consonants*

The correlation of 'tone' with final consonants is so general that it requires no map to illustrate it. The only exception I have come across to the rule that syllables ending in stops have fewer tonal possibilities open to them than those ending in continuants is Northern Chin, in which long syllables ending in -*p*, -*t*, -*k* have exactly the same tonal range as syllables ending in vowels, nasals, and -*l*. Short syllables ending in -*p*, -*'*, -*k* are tonally restricted in the usual way.

MAP 2 — Lᴇxɪᴄᴀʟʟʏ ᴄᴏɴᴛʀᴀsᴛɪᴠᴇ ᴀsᴘɪʀᴀᴛɪᴏɴ ᴏғ ɪɴɪᴛɪᴀʟ ᴘʟᴏsɪᴠᴇs

Attention is here focussed upon the lexically contrastive use of aspirated as against unaspirated plosives in tonic syllables in utterance-initial position.

2.1.   *Lexically contrastive aspiration of voiceless plosives*

Here the standard type-pattern is *p, ph; t, th; k, kh*. Languages in which this pattern is asymmetrical or incomplete are shown with half the relevant square marked as for absence of contrastive aspiration. An example is Vietnamese, in which the aspiration contrast is incomplete in present day pronunciation, since, though the orthography shows a contrast in writing, *t-, th-, ph-, k-, kh-*, these are pronounced [t], [th], [f], [k] and [x] respectively, and there is no initial [p] sound except in a few recent foreign loans such as *pip* < French 'pipe'[29]).
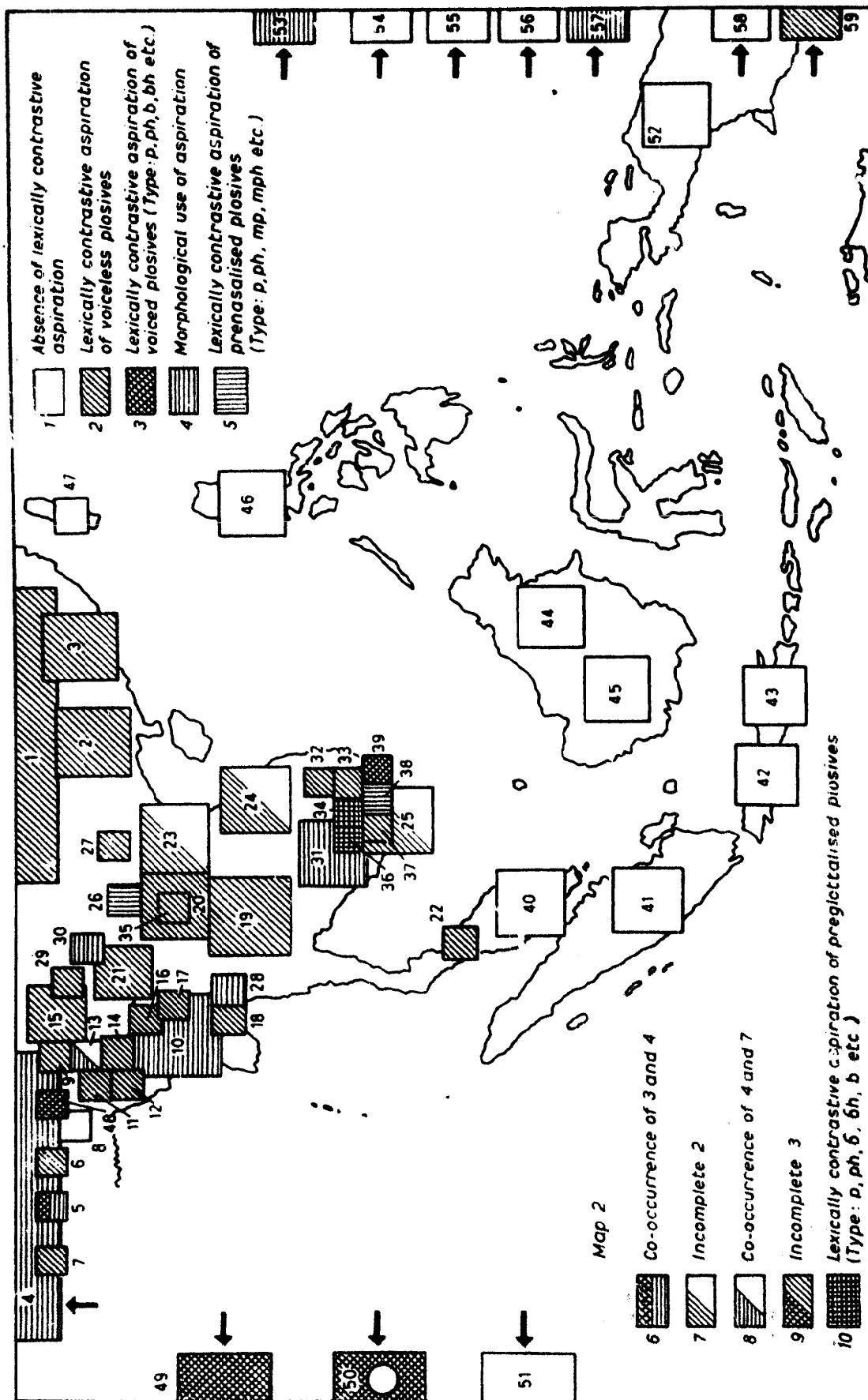
2.2.   *Absence of lexically contrastive aspiration*

It should be noted that in a given language there may be aspiration of initial voiceless plosives, as there is in English for example, but that it may be lexically non-contrastive. Such languages are marked on the map as being without contrastive aspiration. Boro is a case in point.

2.3.   *Lexically contrastive aspiration of voiced plosives*

A distinction is drawn between languages with the type-pattern *p, ph;*

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[29]) L. C. Thompson, however, considers the contrast *t:th* as fortis: lenis rather than non-aspiration:aspiration. For a detailed exposition of his point of view see his forthcoming *Vietnamese grammar* (in the press).

Map 2. Lexically contrastive aspiration of initial plosives (see pp. 413-417)

t, th; k, kh (see above) and those with the type pattern *p, ph, b, bh; t, th, d, dh; k, kh, g, gh.* Among the latter are included the languages of North India and the Munda languages except Sora, which is represented by the small circle within the Munda square. If I interpret Condominas correctly,[30]) Rhadé has both voiced and voiceless aspirated initial plosives, and the Rhadé/Jarai square has been hatched accordingly, although Jarai is not of this type, as far as I am aware. Khasi is shown as making use of the voiced : voiceless aspiration contrast, but it should be noted that the pattern is incomplete, being *p, ph, b, bh; t, th, d; k, kh; (j, jh).* Words with initial voiced aspirates all appear to be either loans or 'affective', with the exception of the word *jhur* 'vegetables', which shows signs of a morphological use of aspiration (see below) in that the compounding form is *hur*.[31])

2.4. *Morphological use of aspiration*

Singled out once again are those languages which make grammatical as well as lexical use of the aspiration contrast. Among such languages are included languages like Khmer in which the aspirated plosives are phonologically clusters made up of two separable units (cp. Khmer *khrŋ* 'to be angry', *kɔmhrŋ* 'anger'), and languages like Burmese, Northern Chin and Limbu, in which the aspiration : non-aspiration contrast is sometimes used to express transitive : intransitive relations. The marking for Northern Chin indicates both that use is made of the contrast grammatically and that the pattern is phonetically an incomplete one, viz. *p, ph; t, th; k, –.*[32]) The marking for Limbu indicates both that limited grammatical use is made of the contrast and that the voiced (or more commonly, lenis) aspirate initials *bh, dh, gh* are restricted to a few loanwords, all nouns.
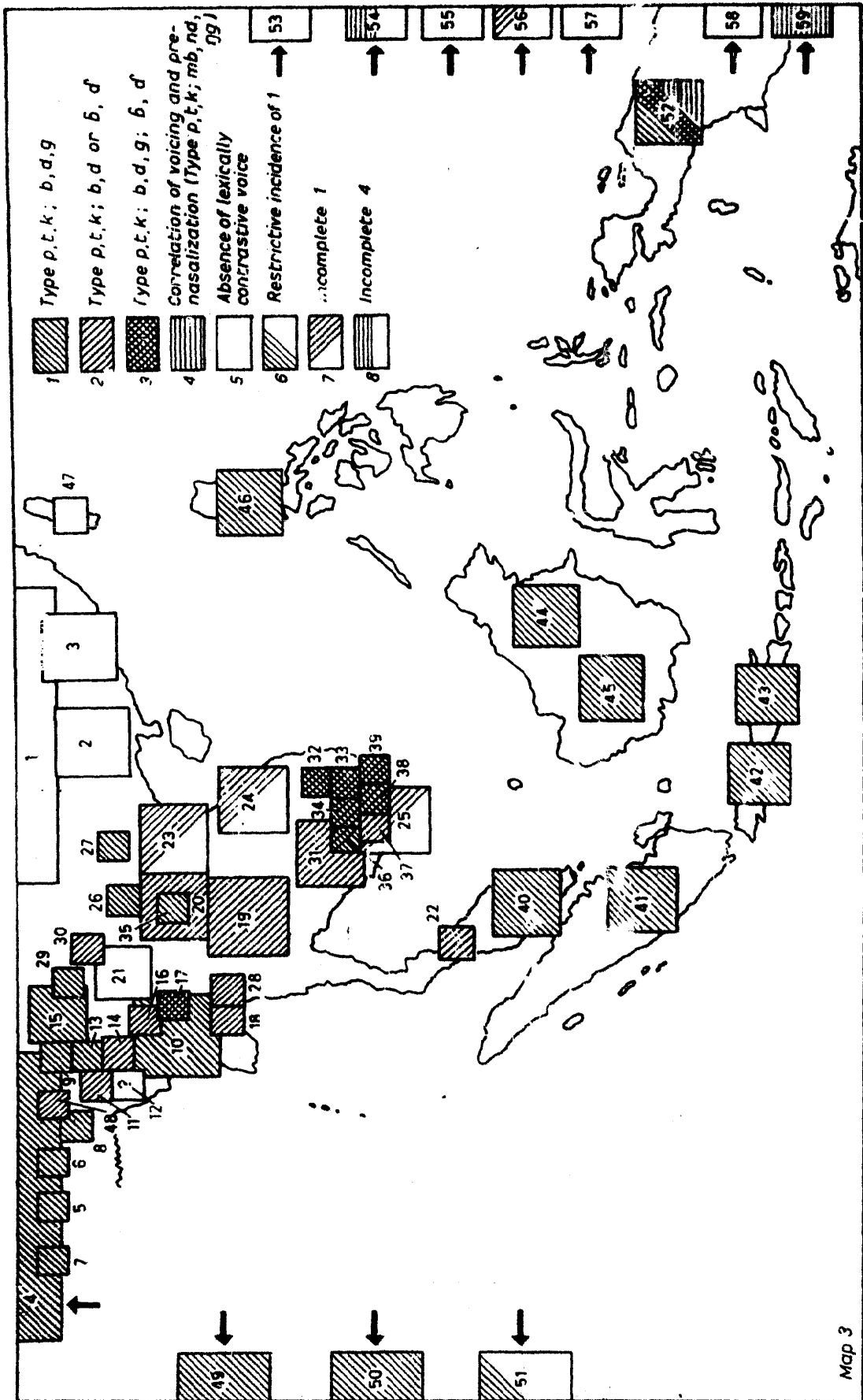
2.5. *Lexically contrastive aspiration of prenasalized plosives*

The unusual co-occurrence of contrastive aspiration and contrastive prenasalization is exemplified by Miao and Chrau. The type-pattern for

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[30]) See G. Condominas, 'Enquête linguistique parmi les populations montagnardes du Sud indochinois,' *BEFEO,* 46, 2, 1954.

[31]) *j, jh,* which are not phonetically plosives, are strictly speaking outside the scope of the present paper (see p. 406) but are introduced here since *jh* affords the only example I have been able to discover of vestigial plosive + aspirate clusters in Khasi, such as are found elsewhere in Mon-Khmer. Khasi aspirated voiceless plosives correspond to unaspirated voiceless plosives in such languages as Mon and Khmer, and must be interpreted as monophonemic phonologically, not as clusters.

[32]) N.Chin (Tiddim) orthographic *kh-* is pronounced [x].

Map 3. Lexically contrastive voicing of initial plosives (see pp. 417-419)

Map 3

the former is *p, ph; mp, mph;* etc., that for the latter *p, ph, b; mp, mph, mb;* etc.[33])

Special attention is drawn to the aspiration contrast found again, after a large intervening area without it, in Kapingamarangi and Ellice,[34]) and in some languages of New Caledonia.[35]) Milner's convincing argument for the morphological origin of the contrast in Ellice and Kapingamarangi is of particular interest in throwing light upon innovation processes.

MAP 3 – LEXICALLY CONTRASTIVE VOICING OF INITIAL PLOSIVES

In this map an attempt is made to plot the use made of the opposition of voiced and voiceless plosives in tonic syllables in utterance-initial position. It may well be that it might be more useful to regard the opposition as being a fortis : lenis one, which would give a rather different distribution, but on the whole it has seemed easier to interpret the existing materials in languages of which I have no first hand knowledge in terms of voice and absence of voice.

3.1. *Type-patterns*

It is important to distinguish here between languages with the type-pattern *p, t, k; b, d, g,* i.e. those making a straight contrast between a voiced and a voiceless series, and those in which *g* is absent. The latter type is very widespread and of such importance in the area that it is not to be regarded as an 'incomplete' *p, t, k; b, d, g* but as a type in its own right. The voiced pair in this type are preglottalized in some languages, not in others, so that two sub-types may be stated, *p, t, k; b, d* and *p, t, k; ɓ, ɗ.* In Map 3 we are, however, only concerned with the general type-pattern *p, t, k; b, d,* or *ɓ, ɗ.* The published evidence for Marma and Khyang is insufficient to decide whether these are *p, t, k; b, d,* or *p, t, k; b, d, g* languages. Only *b* and *d* appear to be recorded for Khyang, but this may be accidental.

Languages in which there are preglottalized plosives *ɓ* and *ɗ* in addition

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[33]) A possible interpretation of the Miao data as recorded by Downer seems to be that there is also *contrastive voiced* aspiration. Downer's notation of the whole set of labial plosives is as follows: *p, ph, pɦ; mp, mph, mpɦ.*

[34]) Cf. S. H. Elbert, *Grammar and comparative study of the language of Kapingamarangi, texts and word-lists,* Washington, 1950, and G. B. Milner, 'Aspiration in two Polynesian languages', *BSOAS.* 21, 2, 1958.

[35]) Cf. Haudricourt, op. cit.

to a full voice contrast are stated as having the type-pattern *p, t, k; b, d, g; ɓ, ɗ*. Bwe Karen is of this type, so are Bahnar, Hrê, Mnong, Chrau and Rhadé/Jarai. Haupers' Stieng material[36]) suggests the unusual type-pattern *b, d, g; ɓ, ɗ* but a note received from R. L. Phillips implies the more likely pattern *p, t, k; b, d, g; ɓ, ɗ*.

The marking for Dravidian indicates that voiced plosives in Tamil (and possibly other languages of the group) only contrast initially with voiceless ones in the 'learned' style of pronunciation of Sanskritic loans, the indigenous and non-learned type pattern being simply *p, t, k*.

It should be noted that Limbu also has voiced initial plosives only in loan-words, and is otherwise a *p, t, k* rather than a *p, t, k; b, d, g* type. The comparative rarity of voiced plosives in absolute initial position in Burmese is also noteworthy.

The Miao picture is a little difficult to interpret, and is probably an example of a language which might be better served by the postulation of a fortis : lenis contrast. There appears, however, to be an opposition which may be interpreted as voiced vs. voiceless. In Downer's preferred transcription the initial labial plosives of White Miao are as follows: *p, ph, pɦ* (see also below).

The marking for Vietnamese is in recognition of the incompleteness of the voice contrast, the type-pattern here being *t, k; ɓ, ɗ*, with an initial *p* pronounced by some speakers in a few recent loan-words from French. (Vietnamese orthographic 'g' and 'gh' are pronounced [γ], with a plosive variant possible for some speakers in certain juncture contexts.) Note that Thompson favours a fortis : lenis contrast for Vietnamese.[37])

As far as I can judge from the very meagre material I have been able to consult, the pattern of Gilbertese is odd and asymmetrical as regards the voice : voiceless, contrast, namely: *t, k, b*.

Khmuʔ is marked as a *p, t, k; b, d, g* type language since, although initial nasals may be preglottalized, it appears that plosives are not.

Javanese is also classed provisionally as a *p, t, k; b, d, g* language, but if the postulation of contrastive phonation-type is confirmed for this language, with the phonation-type regularly correlated with a lenis (but not necessarily voiced) plosive series, it should be re-classified.

It will be seen that there are a variety of type-patterns in New Guinea: *p, t, k; b, d, g* patterns, *p, t, k; b, d* patterns and *p, t, k; b, d, g; ɓ, ɗ* patterns.

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[36]) Cf. R. Haupers, 'Word-final syllabics in Stieng', *Van-Hoa Nguyet-San*, 9, 7 and 8, 1962.

[37]) See n. 29.

A:nong the languages without a contrasting voiced plosive series Samoan presents an interesting sub-type in that one style of utterance has the pattern *p, t, k,* another simply *p, k.*[38])

3.2.   *Correlation of voice and prenasalization*

In languages such as Fijian and Nemi in New Caledonia[39]) voicing of initial plosives is regularly correlated with prenasalization. The standard type-pattern for such languages may be stated as *p, t, k; mb, nd, ŋg.* Fijian, however, has only an incomplete pattern of this type since *p* is absent. There is irregular correlation of prenasalization with voicing in Bahnar, in which a prenasalized voiced plosive is a non-contrastive variant of the oral voiced labial plosive.[40]) Contrastive prenasalization of plosives is dealt with in Map 5 and in the accompanying section of the text.

3.3.   *Lexically contrastive aspiration of preglottalized plosives*

Mnong-Bunor appears exceptional in having a type-pattern *p, ph, ɓ, ɓh, b* etc. (but no *ɓh*).[41])

3.4.   *Morphological use of the voice : voiceless contrast*

There are isolated instances here anu unere in the area of what might be regarded as grammatical as well as lexical use of the voice : voiceless contrast. Sprigg reports one for Tibetan, Shorto one for Wa, a few pairs of semantically linked but grammatically differentiated words in Burmese could also be cited. By and large, however, it is true to say that little or no use is made of this particular phonetic contrast for purely grammatical purposes.

MAP 4 – LEXICALLY CONTRASTIVE RETROFLEXION OF INITIAL PLOSIVES

Any attempt to plot the distribution of this feature in utterance-iniual position is fraught with problems of interpretation, since we at once become involved in the wider problem of initial clusters. It is often

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[38]) See J. E. Buse, 'Two Samoan ceremonial speeches', *BSOAS*, 24, 1, 1961.

[39]) See A. G. Haudricourt, 'Les consonnes postnasalisées en Nouvelle Calédonie', *Proc. 9th Int. Cong. Ling.*, The Hague, 1964.

[40]) See Condominas, op. cit., n. (2) on p 589.

[41]) Information supplied by R. L. Phillips.

difficult to decide whether a retroflex articulation in a given language is to be regarded as a plosive, an affricate or a cluster. In view of the potential importance of this feature as an isogloss delimiting the Indian from other linguistic areas, however, it seems worthwhile to make the attempt.[42])

It seems to me a matter of some interest, possibly not unconnected ultimately with other features such as retroflexion and preglottalization, that in a number of languages of the area, while there is no lexical contrast between a dental and a retroflex series, nevertheless there is a contrast, correlated with voice, and sometimes with both voice and preglottalization, between an initial dental *t* and an initial alveolar (or even post-alveolar) *d*.[43]) Such languages are accordingly also shown on the map. It is probable that the number of such languages is greater than indicated here, since it may be expected that many observers, especially those used to European languages where *t* and *d* pattern together, have failed to observe differences in articulation of *t* and *d* or, if they have observed a difference, have not thought it worth mentioning.

The hatched circle in the Tibetan square is for the retroflex series reported by Sprigg for Sikkimese speakers of Tibetan. It is worth noting in this connection that the contrast in Lepcha is a dental : alveolar one, the words with alveolar initial all appearing to be loans from Sikkimese Tibetan. The retroflexes in Gurung appear to be confined to Nepali loans and are distinct in pronunciation and use from clustered *tr-*.

The circle in the Munda square indicates that though Sora and Korku lack contrasting dental and retroflex plosive series, Sora *t* is dental, and *d* alveolar.[44])

The marking for Southern and Central Vietnamese indicates both that *t* is dental, *d* alveolar (and glottalized), and that there is an initial retroflex articulation, written *tr-* but only occasionally affricate in pronunciation, which contrasts with these.[45]) There is a series of very similar articulations commonly written *tr*, *thr*, in Lushai and Central Chin.

The position of the Dravidian languages needs clarification. It is commonly assumed that retroflexion as such spread to the Indo-Aryan languages of India from the Dravidian group, and yet as far as my

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[42]) Cf. Emeneau, op. cit., and H. L. Shorto, 'The structural patterns of northern Mon-Khmer languages', *LCSEAP*.

[43]) In this connection, see F. B. J. Kuiper's contribution to the conference, 'Consonant variation in Munda', *IPLS*, 1.

[44]) This latter feature is found in other Munda languages also. See Kuiper op. cit.

[45]) Also in some Tonkinese dialects, as verbally reported by Thompson.
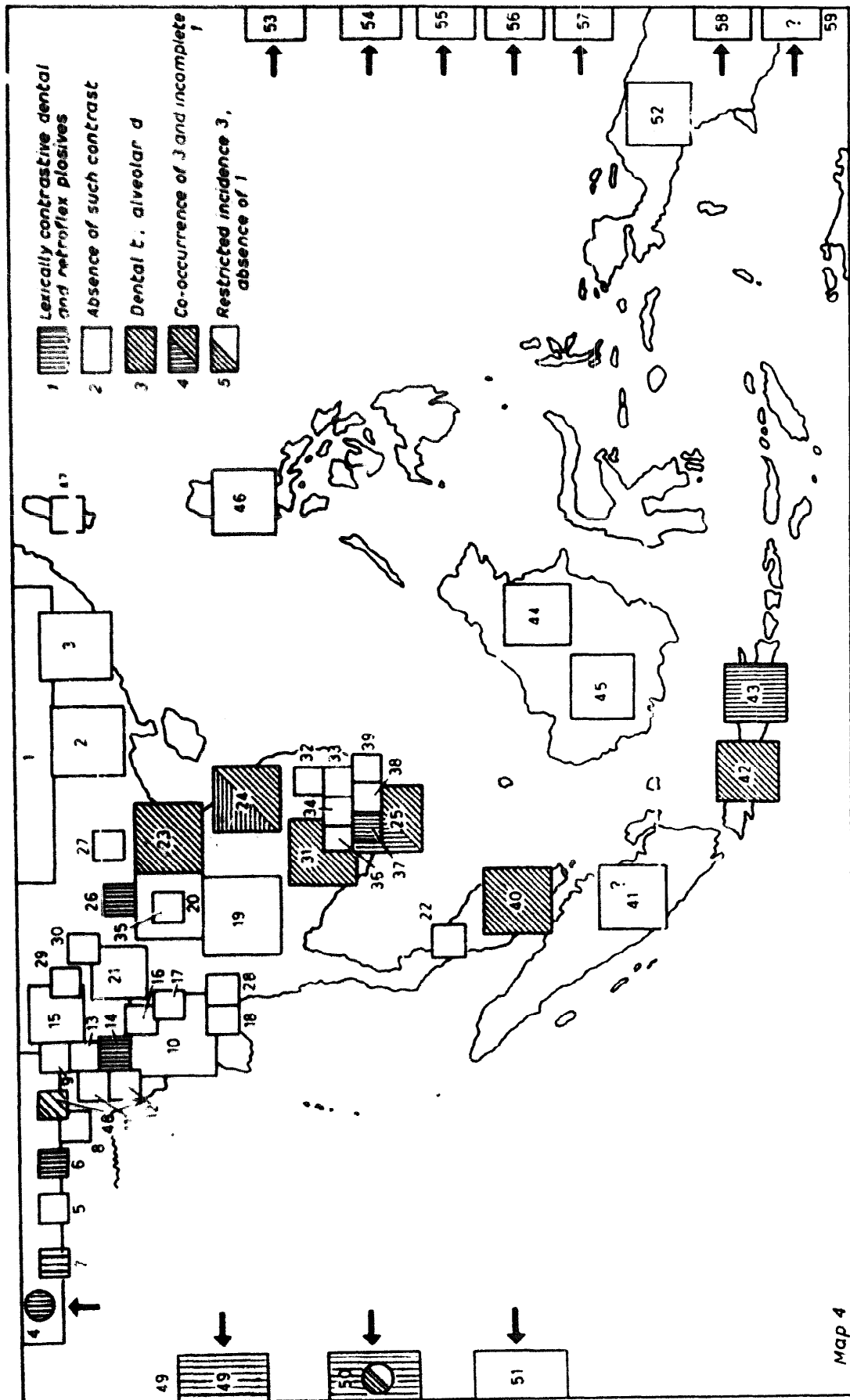
Map 4. Lexically contrastive retroflexion of initial plosives (see pp. 419-422)

preliminary and admittedly superficial enquiries go, there appears to be no contrast between dental and retroflex plosives initially in such languages as Tamil and Telugu, except perhaps in Sanskritic loans in certain styles of utterance. Within the terms of reference of this paper, therefore, such languages must be shown as without lexically contrastive retroflexion, until I have had an opportunity of investigating the position further.[46])

Cham, which is reported as having a 'phonemic contrast between [ṭ] and [t]',[47]) is here treated as having contrastive retroflexion, although Blood decides on grounds of 'patterning' to interpret the retroflex plosive as phonemically a cluster, /tr/.

So far as I am aware, no languages make grammatical, as opposed to lexical, use of the retroflex : non-retroflex distinction.

MAP 5 – LEXICALLY CONTRASTIVE PRENASALIZATION AND PREGLOTTALIZATION

Map 5 indicates the distribution in utterance-initial position of the features commonly referred to in the linguistic literature of the area as 'prenasalization' and 'preglottalization'.[48]) The inclusion of both on the same map is a matter of practical convenience, since they are mutually exclusive on the whole. It is not proposed in this paper to examine in detail what is meant by these labels in articulatory terms. For our purpose a 'prenasalized plosive' is a complex articulation of homorganic nasal and following plosive, or a cluster of heterorganic nasal and following plosive. A 'preglottalized plosive' is a complex articulation of a voiced stop with secondary constriction at the larynx, frequently lightly implosive in character.

5.1. *Type-pattern p, t, k; ɓ, ɗ*

Note that some phonemic accounts of *p, t, k; ɓ, ɗ* languages treat initial *ɓ* and *ɗ* as clusters, e.g. /ʔb, ʔd/.

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[46]) The Dravidian material in this paper is everywhere weak and in need of revision. The heavy Sanskritic overlay, together with the wide contextual variation of phonemes within the indigenous languages themselves, make it peculiarly difficult to elicit from the written accounts the information required without personal consultation with scholars expert in this field.

[47]) See D. Blood, 'Applying the criterion of patterning in Cham phonology', *Van-Hoa Nguyet-San*, 13, 4, 1964.

[48]) It should be borne in mind that not all accounts of languages with a *p, t, k; b, d* pattern make it clear whether the *b* and *d* are preglottalized or not.
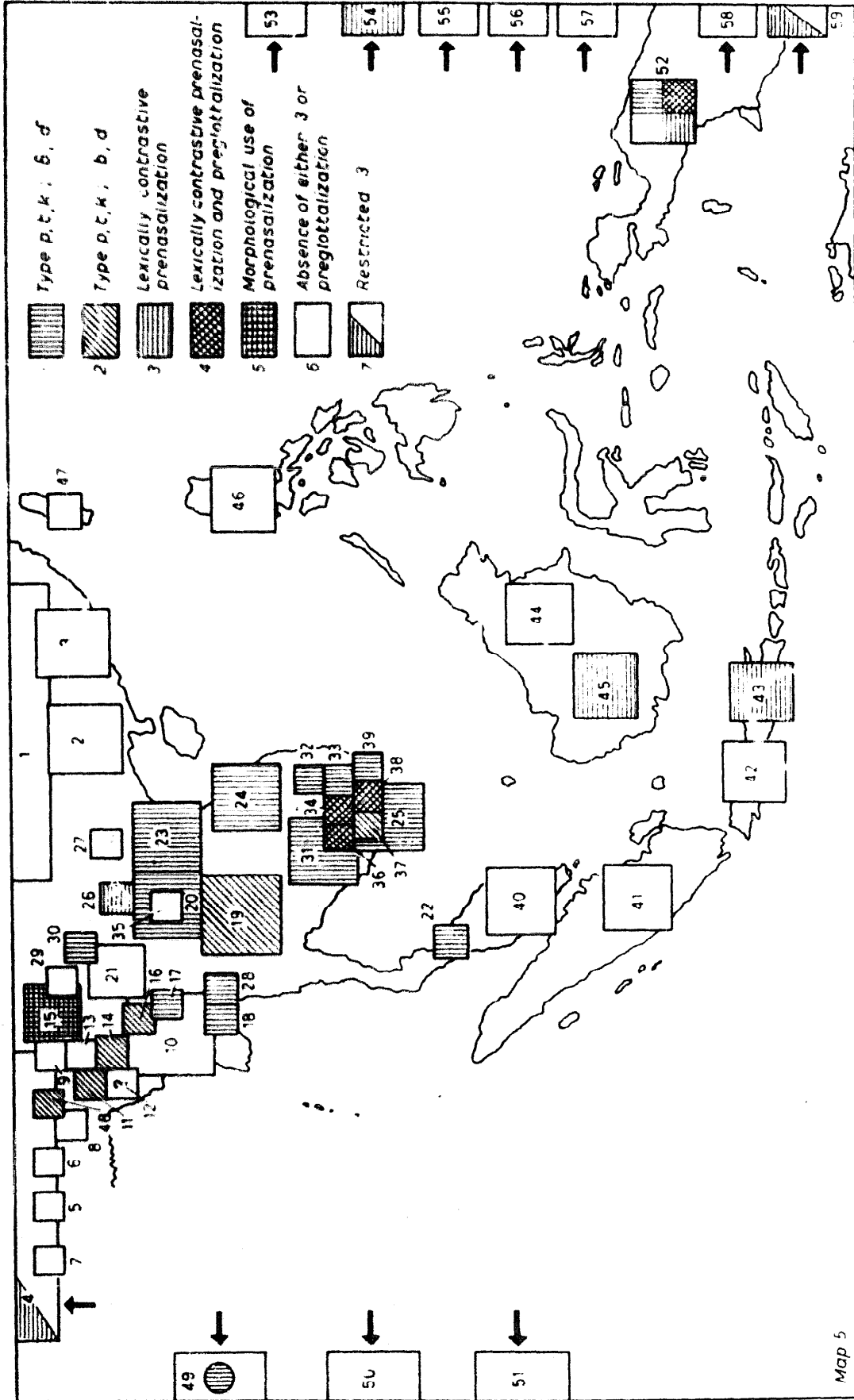
Map 5. Lexically contrastive prenasalization and preglottalization of initial plosives (see pp. 422-425)

The circle within the Northern Indian square draws attention to the 'recursives' of Sindhi.[49])

For Khyang and Marma see p. 417.

5.2. *Lexically contrastive prenasalization*

Languages which have contrastive series of oral and prenasalized plosives are included under this head, even when the prenasalization is regularly correlated with voice, as in Fijian (see above).

The hatched area of the Tibetan square draws attention to the fact that Tibetan reading style has prenasalized initial groups, *mb-, nd-, ŋg*, which are absent in the spoken style except in intervocalic position.

5.3. *Lexically contrastive prenasalization and preglottalization*

Stieng, Mnong, Srê, Chrau and some of the New Guinea languages appear to have contrastive series of oral, preglottalized and prenasalized consonants. If I interpret the Condominas and Thomas accounts correctly, Mnong Gar and Chrau share the distinction of having prenasalized preglottalized plosives, *nd, mɓ*.[50])

Attention is drawn once again to the variety of type-patterns reported for New Guinea, in which there are languages with preglottalization but no prenasalization, others with prenasalization but no preglottalization, others again with both, and yet others with neither.

5.4. *Morphological use of prenasalization*

This appears to be rather rare. Phillips reports such forms as *duh* 'hot', *nduh* 'to heat' 'and many other examples' from Mnong Bunor.

Kachin is tentatively marked as having distinctive prenasalization and as using this feature morphologically. Information is incomplete, however, and it is possible that we are concerned here with the operation of a single prefix. It should be noted that many other languages of the area in some styles and speeds of utterance pronounce certain unaccented form-words as syllabic nasals, which one might be justified in regarding as 'prenasalization' of the following initial consonant. Such occurrences, however, appear to differ from Kachin usage in that they are not utterance initial and so fall outside the scope of the present investigation. Gilbertese,

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[49]) See R. L. Turner, 'The Sindhi recursives or voiced stops preceded by glottal closure', *BSOS*, 3, 1923–1925.

[50]) Phillips confirms the presence in Mnong of prenasalized preglottalized plosives.

on the other hand, appears to have such initial clusters as *mt-*, *mk-*, *mb-*, for which there may be a morphological explanation.

It should be noted that in the context of this paper morphological alternation between an initial plosive and an initial nasal (e.g. as in Sea Dayak) does not count as morphological use of prenasalization in phonetic terms.

There is no record, as far as I am aware, of a language in which pre-glottalization is used morphologically.

5.5. *Prenasalization and retroflexion*

Javanese appears to be the only language with contrasting prenasalized dental and retroflex plosives.

## 5.6. *Co-occurrence of prenasalization and postnasalization*

Haudricourt has drawn attention to a rare pattern in Nemi, in New Caledonia,[51] in which there are contrastive series of oral, prenasalized and what he calls 'postnasalized' initial plosives, for which the type-pattern *p*, *pm*, *mb* etc. may be stated. Postnasalization appears some-times to have a morphological function.

MAP 6 – FINAL CONSONANT PATTERNS

Since the contrastive consonant alternance in utterance-final position is everywhere in the area very much more restricted than that in utterance-initial position,[52] we shall cast our net wider here to include nasals, liquids and sibilants as well as stops.

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[51]) See 'Les consonnes postnasalisées en Nouvelle Calédonie', n. 39 above.

[52]) If one's theoretical standpoint allows one to extract from one's data, for treatment at another level, all features marking syllable boundaries, it is often quite easy to present a *phonological* statement in which the initial and final phoneme inventories are the same (see Eugénie J. A. Henderson, 'Prosodies in Siamese', *Asia Major*, NS. 1, 1949), or very nearly so. Hence it seems to me that David Thomas's comment that Richard Watson's 'Pacoh' is the 'first reported Mon-Khmer language with no major differences in inventory between initial and final consonant phonemes' (see R. Watson, 'Pacoh phonemes', *Mon-Khmer Studies 1*, 1964, and Thomas's Introduction to the volume) has no relevance to typological comparative studies. Watson achieves his near-symmetry by deciding to treat final [-uʔ] and [-iʔ] as 'word-final allophones' of phonemes whose initial allophones are [ˈbʲ and [ˈdʒ]. This procedure, while perfectly defensible from the point of view of a statement of the internal structure of Pacoh, would, if applied to other Mon-Khmer languages, very frequently result in similarly
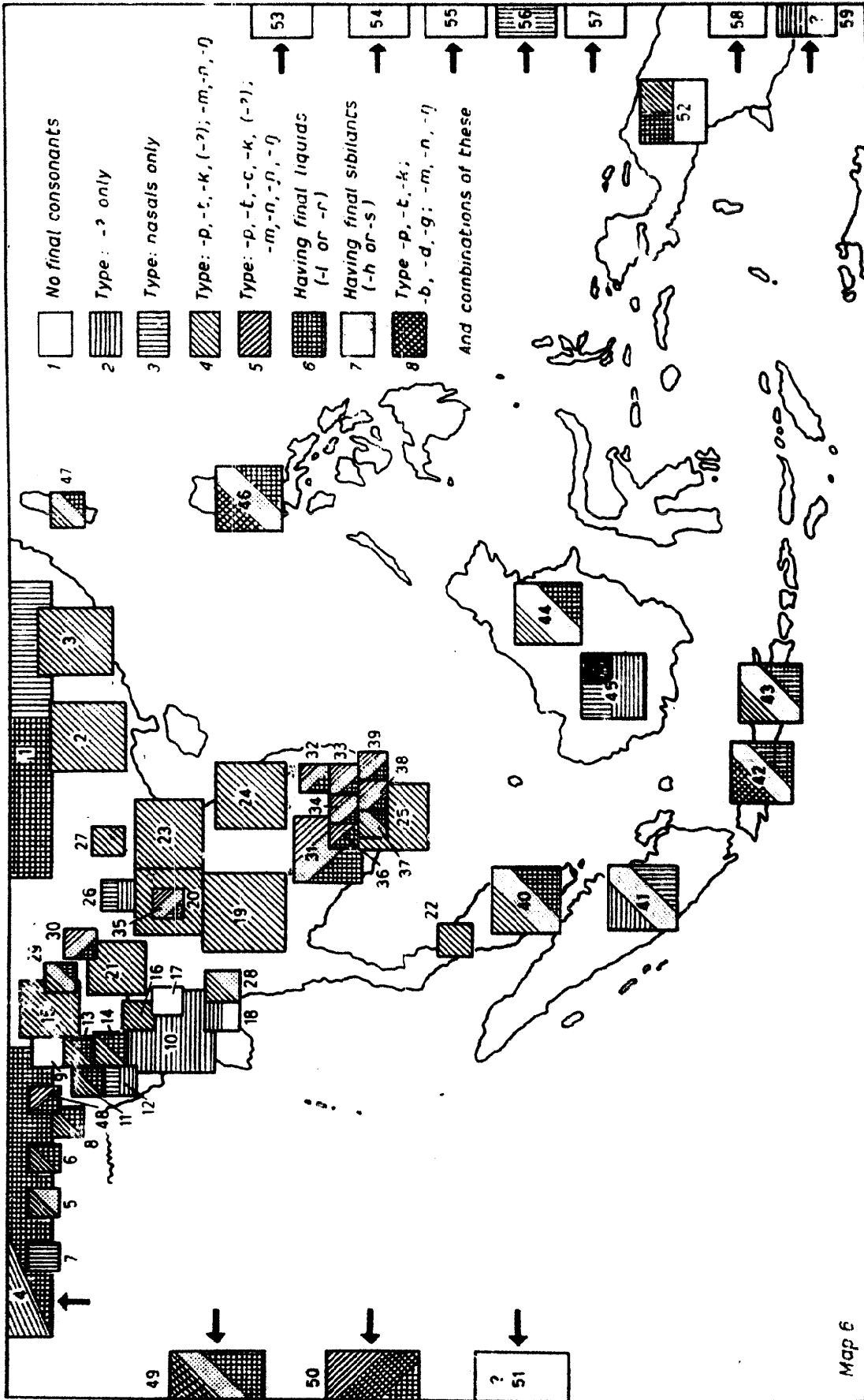
Map 6. Final consonant patterns (see pp. 425-429)

Problems of the interpretation of the phonetic data here centre upon final glottal constriction and the glottal stop, and upon such features as final nasal plosion. Where there are other final stop consonants, a final glottal stop offers no special difficulty, since it will behave like them as regards tonal restrictions and may be subsumed with them. Where there are no other stop consonants, however, the question may arise as to whether a final glottal stop is to be regarded as the solitary example in the language of a final stop consonant or whether it is to be interpreted as a concomitant feature of the tone or tones with which it occurs. Burmese is a case in point. Final glottal constriction, weaker than that associated with the glottal stop, presents similar problems (when it has been recorded) and some scholars have chosen to regard it as an allophone of a laryngeal phoneme of some sort. Where there is a range of final consonants in the language, glottal constriction of this kind may, unlike the full glottal stop, be associated with tones other than those proper to syllables ending in final stops. Here the solution proposed has sometimes been to postulate final clusters of nasal + *ʔ* etc., just as some scholars have wished to regard initial glottalized consonants as clusters with initial *ʔ*.[53]) Similar interpretations have also been put forward of the final nasal or lateral plosion which is found as a stylistic or contextual variant of final consonants in some languages of the area, e.g. Mon, Khmer, Songkhla, and Stieng. For the purposes of this study, since such variants are not lexically contrastive they do not require separate plotting on the map. In Land Dayak, however, final nasal plosion does contrast lexically with a simple final nasal articulation (as in such pairs as [kənaŋ] 'posterior', and [kənagŋ] 'Straits robin'),[54]) and is accordingly shown on the map with a special blacked-in section on the relevant square.

The various type-patterns and combinations of patterns are plotted on Map 6, and should be readily followed with the key supplied. The following notes and comments may, however, be helpful:

The marking for Southern Karen indicates a 'partial' or 'debateable'

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symmetrical, though different, inventories. From the typological point of view it seems less misleading to stick closer to the phonetic substance.

[53]) Khasi, which cannot by any reckoning be regarded as tonal, is interesting and unusual in that the final consonants pronounced in most contexts as -*p*, -*t*, -*c*, -*k* are frequently pronounced as post-glottalized nasals in pre-pause position, viz. -*mʔ*, -*nʔ*, -*ɲʔ*, -*ŋʔ*. Khasi is, however, here classified as having the type-pattern -*p*, -*t*, -*c*, -*k*, -*ʔ*; -*m*, -*n*, -*ɲ*, -*ŋ*. For comment upon the secondary character of final -*k*, see my paper to this conference, 'Final -*k* in Khasi: a secondary phonological pattern', *IPLS*, I.

[54]) See N. C. Scott, 'Nasal consonants in Land Dayak' in: *In Honour of Daniel Jones*, ed. D. Abercrombie et al., London, 1964.

type-pattern -ʔ, since these languages may or may not be regarded as having a final consonantal -ʔ according to one's interpretation of the relationship of the final glottal stop and tone.

The shading of the Mandarin square is intended to indicate the presence in that language, which otherwise has final nasals only, of syllabic [ɹ] in final position.

Among the languages with *nasals only* patterns, Gurung appears to have final -ŋ only, Gilbertese only final -m and -n.

The type-pattern -p, -t, -k, (-ʔ); -m, -n, -ŋ indicates a final contrast between stops and nasals. An interesting sub-type here would comprise those languages in which there is phonetic alternation between -k, and -ʔ in some contexts. Note that some scholars, like Haas and Egerod, use the symbols -b, -d, -g rather than -p, -t, -k for the final unexploded stops of Tai languages. There is, however, no contrast between final voiced and unvoiced stops in such languages.

Alone among the languages plotted Atayal has contrastive final velar and uvular stops. This is not specifically indicated by the hatching.

The type-pattern -p, -t, -c, -k, (-ʔ); -m, -n, -ɲ, -ŋ, refers to languages in which there is a contrast between a final apico-dental (or, usually, alveolar) stop or nasal and a dorso-palatal one. Many scholars class Northern Vietnamese as of this type. The reasons I have not done so have been given elsewhere.[55]

Marma appears to have an asymmetrical type-pattern which is a combination of types 2 and 3 on the map, namely: -ʔ, -m, -n, -ŋ. Miao, which is shown in the same way on the map, has a restricted final pattern in which the only contrasting final consonantal articulations are the glottal stop and a nasal, either n or ŋ depending on the preceding vowel.

. Tibetan requires special comment. There are currently three different final consonant patterns here, -p, -t, -k, ʔ; -m, -n, -ŋ; -r, -l for the spelling style; -p, -k, -ʔ; -m, -ŋ; -r for the reading style; and a much more restricted pattern, -p (and rarely -k); -m for the colloquial style.[56]

A variety of patterns is described for the New Guinea languages, -p, -t, -k; -m, -n, -ŋ; -l for some of the Dani languages, and a somewhat erratic pattern for Yabem/Bukawac': -p, -ʔ; -b; -m (-n rare); -ŋ.

The position in New Caledonia is also mixed. Haudricourt reports a

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[55] In a paper entitled 'The articulation of final -*nh* and -*ch* in Vietnamese' submitted to the 5th International Congress of Phonetic Sciences, Münster, 1964, and to be published in the proceedings of the Congress.

[56] Information by personal communication from R. K. Sprigg.

series of final nasals for the northern group of languages whereas Houaïlou appears only to have final -*P*.[57])

The marking for Munda indicates that the general picture appears to be of the type -*p*, -*t*, -*c*, -*k*, (-*P*); -*m*, -*n*, -*ɲ*, -*ŋ* with final liquids, but that Zide assumes an additional final voiced series, and apparently, a final unchecked voiceless series distinct from the voiceless checked series, for Hindi loans in Santali. It is not clear to me, however, how far this assumption is based upon observations of pronunciation and how far upon the orthographic forms in Santali dictionaries and grammars.[58])

The special case of contrastive simple final nasals and final nasal plosion (perhaps the latter might in this context be thought of as an instance of final postnasalized plosives) in Land Dayak has already been mentioned.
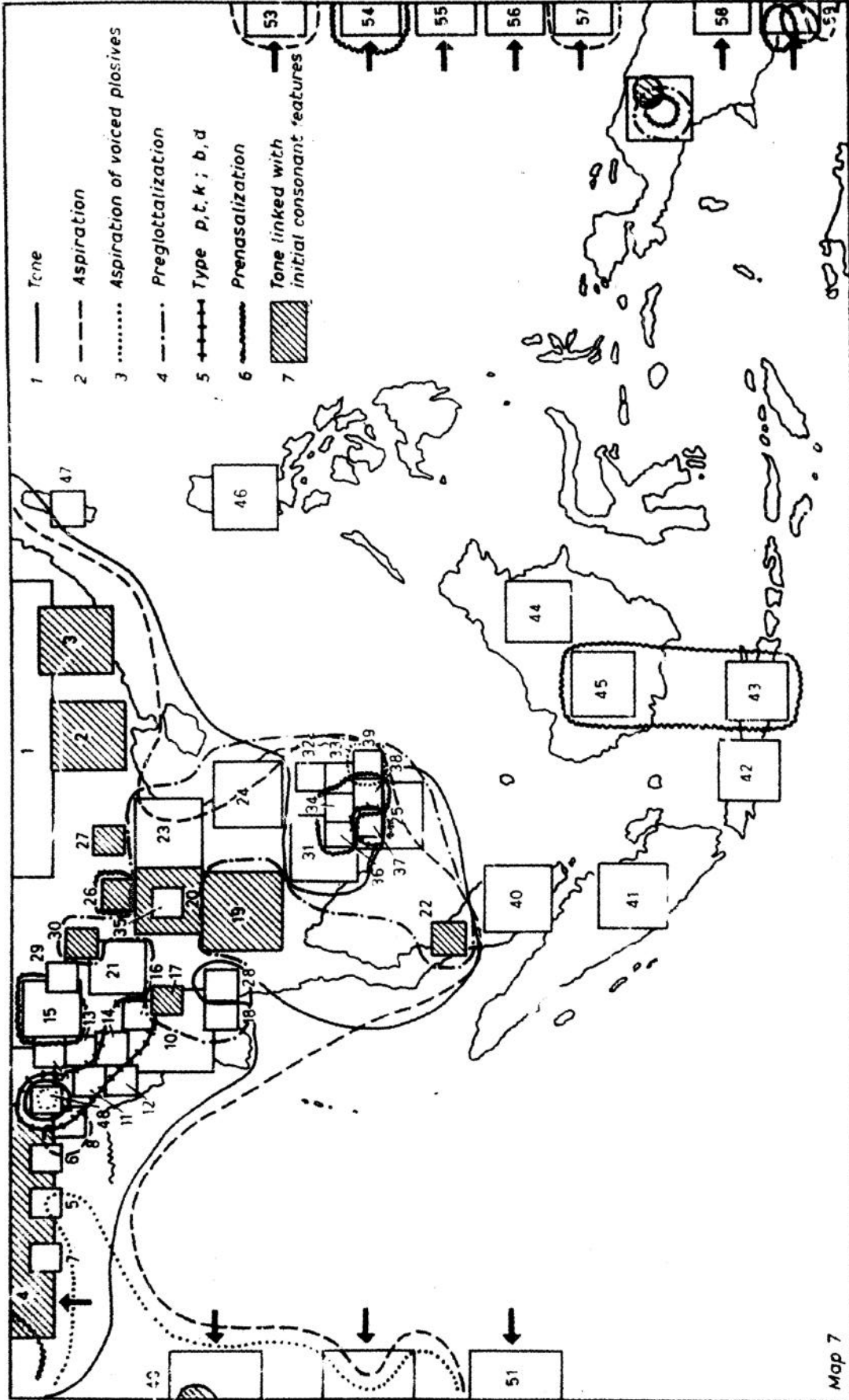
MAP 7 – Isoglosses

From the contemplation of maps 1-6 one may discern the provisional outlines of a number of areal isoglosses, a few of which it is attempted to show in map 7. 'Aspiration : non-aspiration' splits the area into two, and includes on one side roughly the whole North Indian linguistic area and the Sino-Tibetan area on the mainland, and on the other the South Indian languages and the languages of the Islands, with pockets of 'aspiration' in the Pacific, and pockets of 'non-aspiration' within Munda and in Assam. This isogloss overruns accepted language-family boundaries, therefore, in that it includes the Sino-Tibetan, Indo-Aryan, Mon-Khmer and most of the Munda languages within one large linguistic area. This area may be further subdivided by the voiced aspirate : voiceless aspirate isogloss, but here again, though we appear to succeed in separating a North Indian linguistic area from the larger one, we are left with pockets of 'voiced aspirate' languages in Rhadé, Lepcha, and Khasi, in the last two of which the feature may be regarded as an encroachment from the neighbouring North Indian linguistic area. The apparently secondary development of a distinctive series of voiceless aspirates in widely separated locations in the Pacific area is particularly interesting.

It is, of course, a commonplace that the 'tone' isogloss corresponds closely with the boundaries of what is generally accepted as the Sino-

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[57]) S. Kasarhérou, 'Prosodèmes de la langue mélanésienne de Houailou', *BSL*, 56, 1961.

[58]) See Zide, 'Final stops in Korku and Santali', cited above.

Map 7. Isoglosses (see pp. 429-432)

Tibetan family of languages, with extensions into some of the encircled Mon-Khmer languages and to Vietnamese on the eastern fringe of the mainland.[59]) It is surely significant that disagreement as to which languages of the area are tonal and which are not should centre upon just these encircled languages and upon certain others (e.g. Limbu) on the borders of the Indian linguistic area. The outcrop of tone in both fringe areas, in New Guinea and New Caledonia on the one hand, and Panjabi (and possibly Korku) on the other, should be noted, while the typological affinity with tone languages outside the area, such as those of Africa and America, must not be forgotten. Of especial interest is the fact that in both Panjabi and New Guinea tone is linked to phonetic features associated with initial consonants, with aspiration in the former and with the voice : voiceless contrast in the latter. Similar linkage with initial consonant features is fairly widespread on the South East Asian mainland and is shown by hatching on the map. The isogloss for such linkage delimits a fairly large slice of the mainland extending from Hakka and Cantonese through Miao, Yao and Rianglang southwards to Lao and Thai (central and south) and including Bwe Karen in Burma; there is then a leap to Tibetan, with Shan, Burmese, Chin, most of the Karen dialects, and Vietnamese excluded. As far as I know, no correlation between initial consonants and tone is reported for the tone languages of Africa and America. It may be noted that in attested 'register' languages like Khmer and Mon, and, according to Catford, Javanese, there is always a link between register and initial consonant, though the pattern may sometimes be blurred, as in Modern Mon, by loanwords. 'Register' appears also to be stateable for some of the contiguous tribal languages of South Vietnam, Bahnar, Mnong, Brou, etc. It is noteworthy, however, that no regular correlation between initial consonants and tone can be stated for modern Vietnamese, though such a correlation may have existed in the past.[60])

One of the most characteristic features of the South East Asian mainland area is the incidence of the so-called 'preglottalized' consonants. ɓ and ɗ are probably the most widespread, but preglottalized nasals and semivowels are also reported in some areas. We shall be concerned here

[59]) Such a view is dependent, of course, upon the belief that Vietnamese is an Austroasiatic language that has adopted tone, rather than a Tai language with a puzzling number of Austroasiatic words in its everyday vocabulary.

[60]) See A.G.Haudricourt, 'Sur l'origine des tons en vietnamien', Journal Asiatique, 1954.

only with the plosives, an isogloss for whose occurrence, as far as can be determined from existing accounts, is shown on the map. The whole problem of the distribution of these sounds is bedevilled by the fact that one can often not be certain that the record is accurate. Many plosive systems in the area are of the asymmetrical type, *p, t, k; b, d,* with no *g.* Many such systems may, upon further investigation, turn out to be of the type *p, t, k; ɓ, ɗ.* Others certainly are not so at the present time. The isogloss for languages exhibiting the type-pattern *p, t, k; b, d,* – which may in some cases represent more accurately *p, t, k; ɓ, ɗ,* – is also shown on the map and will be found, significantly surely, to be by-and-large contiguous to the attested preglottalized area proper, the area of greatest concentration being in the Indo-Chinese peninsula, with fingers reaching up towards Rianglang and Khasi. Karen and Central Chin represent pockets of *p, t, k; ɓ, ɗ* or *p, t, k; b, d* languages in a relatively large area, represented by Burmese, Shan, Palaung and Kachin, which are either *p, t, k; b, d, g* or *p, t, k* languages. Northern Chin appears to have 'gone over' to the type-pattern *p, t, k; b, d, g,* the *g-* forms in the language being cognate with *r-* forms in Central Chin and Lushai. Those who incline to the view that the *p, t, k; b, d/ɓ, ɗ* pattern is a Tai one which has spread to contiguous non-Tai languages must find some way to account for the fact that Khasi, entirely without contact with any extant Tai language or with other Mon-Khmer languages, is nevertheless of this type. Is Ahom assumed to be the link here, or is the Tai dissemination theory one which will not hold water? The sporadic outcrop of *p, t, k; b, d* patterns recently reported from certain New Guinea languages must also be taken into account.

A striking feature of this preliminary investigation has been the seeming concentration of putative areal characteristics in the New Guinea group of languages and in the tribal languages of South Vietnam. In the present state of our studies it would be premature to speak either of 'confluence' or of 'dissemination' in this connection, but it may be helpful to think in terms of 'concentration areas'. Fuller investigation may well locate other such areas. The available date on the Miao languages, for example, and recent reports on the New Caledonian languages suggest that these may constitute two additional concentration areas.

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All the information on Hrê and Sedang was supplied by R. L. Phillips of Cornell, at whose suggestion the Hrê/Sedang square was added to the maps. Much useful information was also received from him on other tribal languages of Vietnam, e.g. Mnong, Srê, Bahnar, Stieng.

For Gilbertese I have referred to recordings made some years ago by H. G. A. Hughes.