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THE PHONIC EVALUATION OF THE S- AND Z- SIGNS
IN MYCENAEAN

The phonic problems of the Z- series of the Linear Script B (we mean signs ZA ZE, ZO)¹ have already attracted great attention of many scholars. It is specially the following studies that should be pointed out: *H. Mühlstein*, Zur mykenischen Schrift: die Zeichen za, ze, zo, Mus. Helv. 12 (1955), 119—131; *L. R. Palmer*, Observation on the Linear B Tablets from Mycenae, Bull. of the Inst. of Class. Studies of the Univ. of London 2 (1955), 36—45; *J. Chadwick*, La représentation des sifflantes en grec mycénien, Ét. Myc. (Actes du Coll. Intern. sur les Textes Myc. 1956, ed. M. Lejeune, Paris 1956), 83—91; *M. Lejeune*, Les sifflantes fortes du mycénien, Minos 6 (1958), 87—137. The question has been carefully dealt with also in a number of other works, above all in the synoptic grammatical studies and in various Mycenaological compendia, such as *M. Ventris—J. Chadwick*, Documents in Mycenaean Greek, Cambridge 1956, pp. 80 sq.; *C. Gallavotti*, Documenti e struttura del greco nell' età micenea, Roma 1956, pp. 93 sqq.; *S. J. Lurja*, Jazyk i kultura mikenskoj Gretsii, Moskva 1957, pp. 50 sqq.; *M. F. Galiano*, Diecisiete tablillas micénicas, Estudios Clásicos, Suppl. no. 5, p. 127; *A. Thumb—A. Scherer*, Handbuch der griechischen Dialekte II², Heidelberg 1959, pp. 337 sq.; *E. Vilborg*, A Tentative Grammar of Mycenaean Greek, Stockholm 1960, pp. 47 sq.; etc.

Taking into account the positive outcome of all the above-quoted efforts as well as of other similar ones, we are today in the position to draw the following few important conclusions with respect to the phonic quality masked by the Mycenaean Z- signs:

1. The Mycenaean Z- reproduced in almost every case sounds that were substituting the proto-Greek phones or proto-Greek phonic groups which were going to undergo some sort of palatalization. The sounds reproduced by the Mycenaean Z- sprang up namely from the following proto-Greek sources:

a) *j-*: e. g. ze-u-ke-u-si PY² Fn 50.9, 79.10 \cong **jeugeusi*³ [Dat. Plur. of **jeugeus*; cf. ζεύγυμι]; more examples of the same kind and importance may be quoted if necessary.

b) *(-)gj-*: e. g. me-zo, me-zo-e, me-zo-a₂ PY and KN often \cong **megjō-* [various forms of Comp. **meg-jōn/meg-jōs*; cf. Att. μεῖζων, Ion., Arc. etc. μέζων]; more examples of the same kind and importance may be quoted.

c) *(-)g^wj-*: zo-wa KN X 766 al. \cong **g^wjōwa* [Nom. Plur. N.; cf. ζῶον], this interpretation not being quite certain [see below, sub h].

d) *(-)dj-*: e. g. to-pe-za PY Ta 642.1.2.3 al., KN V 280.5 \cong **trpedja* > **torpedja* [Nom. Sing.; formed from **k^watj-* + **pedja*; cf. τράπεζα]; more examples of the same kind and importance may be quoted.

e) *-kj-*:⁴ ka-zo-e PY Va 1323 \cong **kakjo(h)es* [Nom. Plur. Masc. of Comp. *kak-jōn/kak-jōs*; cf. Hom. κκρίων]⁵ and ku-ru-zo TH XII \cong **gluk-jōn/gluk-jōs* [Comp. of *glukus* γλυκύς], the latter interpretation being, however, not quite certain.

f) (-)k^wj: a-o-ze-jo PY Na 588 \cong **aosseĩoi* [Dat. Sing.; formed from *sek^w-j-*; cf. ἀοσσέειν], but this interpretation is very dubious.

g) -tj-: ke-re-za PY Aa 762 al. \cong **Krētjai* [Nom. Plur. of the ethnical name **Krētja* > **Krētja*; cf. Ion. Κρησσαι], this interpretation being often held for dubious.⁹

h) (-)tw-: *Mühlestein*, MH 12, 128, quotes zo-wa KN X 766 al. \cong **twōwa* [Nom. Plur. N.; cf. σῶ(φ)ος < *tw-*]; several further examples are extremely problematic, but even in zo-wa the initial Z- may be a mask for the proto-Greek *g^wj-* as well (see above, sub c).

i) -gia- with hiatus i: ai-za PY Ub 1318.7 \cong **aigiā* or **aige(j)ā* [Fem. of Adj. derived from *aiks* αἶς; cf. αἷρε(ι)ος], this interpretation being, however, not quite certain.

j) -kia-, -k^wia-⁷ with hiatus i:⁸ su-za KN F 841 al.⁹ \cong **sūkiai* or *sūke(j)ai* [Nom. Plur.; cf. Aeol., Dor. σούκι, Ion. σούκη], ka-za KN M 0452 \cong **khalkiā* or **khalk(j)ā* [Fem. (?) of Adj. derived from *khalkos* χαλκός; cf. χάλκε(ι)ος],¹⁰ correctness of these interpretations being only probable.

These facts, derived from the study of the respective material, made some authors draw the simplifying conclusion that the Mycenaean series of Z- signs masked some palatal explosive; thus *Palmer* in BICS 2, 41, speaks of "a palatalized consonant intermediate between δ and γ ", and in *Thumb-Scherer* 337 the Mycenaean Z- is ascribed the value of *tj/dj*. It was *Chadwick*, however, who offered a more satisfactory explanation when he postulated in *Ét. Myc.* 87 the palatal character not of the sounds that were reproduced with these signs at the time of the preserved Mycenaean documents, but of the predecessors of these phones, existing in the period in which the Linear Script was only being adopted for rendering Greek. As to our own standpoint, we feel inclined above all to believe that as early as at that time all the velar and dental palatalized—or assibilated—explosives taken together must have represented only two phonemic units, i. e. that as early as then the substitute for the proto-Greek *k(h)j* must have been joined with the substitute for the proto-Greek *t(h)j*, just as the substitute for the proto-Greek *gj* was obviously joined with the substitute for the proto-Greek *dj* again.¹¹ Thus, from this point of view *Palmer's* or *Scherer's* phonetic interpretation of the Mycenaean Z- may be said to mirror the situation of an early—perhaps even pre-Linear—stage of the Mycenaean era, but no more the original proto-Greek situation.

2. With the Mycenaean Z- there corresponds in the later, alphabetic transcription of Greek in great majority of single comparable cases and of single Greek dialects spelling which conceals some spirant, or directly a sibilant. This holds good especially:

a) with regard to cases that were grouped under a, b, c, d of our paragraph No. 1 [the substitute for the proto-Greek *j-*, *-gj-*, *-g^wj-*, *-dj-*¹² is reproduced¹³ in most Greek dialects with the affricate, if not directly pure sibilant, Z-, I,¹⁴ F¹⁵ spellings],¹⁶

b) and likewise with regard to cases under e, f, g, h in the same paragraph [the substitute for the proto-Greek *-k(h)j-*, *-k^w(h)j-*, *-t(h)j-*, *-tw-* is reproduced¹³ in most Greek dialects¹⁷ with the sibilant spellings ΣΣ, or ΣΣ/Σ¹⁸, or maybe also with the signs T,¹⁹ U,²⁰ which were most likely masks for an affricate pronunciation];

c) while as for items under i, j of the above-mentioned paragraph No. 1, the consonantal element of the Mycenaean signs ZA, ZE, ZO, substituting the initial elements of the original *kia*, *k^wia*, *gia*, was after all a similar manifestation of an assibilation process, as we find it to be the case many centuries later, e. g. in expressions like Ζιονιστος, Ζώνιστος, which may be found in dialectic documents of the Aeolic area.²¹

Thus, of these three facts it is especially the sibilant²² continuation of the proto-Greek *j*-, *-gj*-, *-g^wj*-, *-dj*-, *-k(h)j*-, *-k^v(h)j*-, *-t(h)j*-, *-tw*-, almost universally adopted in alphabetic Greek, which led already *Ventris-Chadwick* in the Documents 80 to the correct conclusion that Mycenaean signs of the Z- series masked „some sort of sibilant”. Yet, of the adherents of the sibilant theory only a few have so far tried to determine more precisely what sort of sibilant it actually was. Most research-workers, finding far too few sufficiently safe supports to rely on in such investigation of concrete phenomena, have up till now been content with assuming here some sort of sibilant shade without trying to identify more precisely the shade in question. Exceptions to the rule among the Mycenaean researchers endorsing the sibilant theory appear to be in this respect only *S. J. Lurja* and *M. Lejeune*. *Lurja*, while treating this question, starts with refusing—first in his article *Opyt čtenija piloskikh nadpisej*, *Vest. drevnej istorii* 1955, vol. 3, pp. 8-36, but mainly in his work *Jazyk i kultura* 50 sqq.—to ascribe the D- series of Mycenaean signs the explosive character. He believes that due to a pre-Greek substratum there had occurred in Mycenaean several phonic changes which most Greek dialects did never fully accomplish and of which only a very few odd traces were left in the Classical Era; thus assuming the shift of the proto-Greek *d* into some kind of (*d*)z he transcribes all Ventris's D- signs as Z-signs, and goes on designating in this connection Ventris's Z- series—not quite convincingly—as “C- series”, ascribing it with an all-round validity the phonetic value of a “soft (palatalized) variant” of the phone *k*.²³ This view, however, has not been shared by others, so far, due to the fact that above all the former of the two phonic changes lacks sufficiently reliable documentation. More substantiated appears to be *Lejeune's* hypothesis, as it is first indicated in his article *Essais de philologie mycénienne*, *Revue de Philologie* 81 (1955), 148, note 9 [some other studies of his in early fifties containing allusions to it as well], and as we find it systematically expounded mainly in his above-mentioned work published in the journal *Minos* 6 (1958), 87—127. *Lejeune* discusses there the possibilities of a phonetic interpretation of the signs of the Mycenaean Z- series in connection with the analysis of the phonetic historical content of the Mycenaean S-, ascribing in the end the Mycenaean Z- the value of *ss*, and contrasting it as a “sifflante forte” with the “sifflante normale” *s*. At the same time he stresses, on the one hand, that the former might have had both a voiced and a voiceless realization, and, on the other hand, he thinks it possible that “sifflante forte” still had an affricate character in Mycenaean [*Lejeune* very likely had in mind the pronunciation affricate *ts*, *dz*, although he does not expressly say so].

This explanation of *Lejeune* probably represents the most successful attempt so far to determine the phonetic value reproduced by Mycenaean Z-; we have in mind chiefly *Lejeune's* admission of the possibility of his “sifflante forte” having an affricate character, whereas *Lejeune's* above-said *ss*-transcription does not seem to us a lucky presentation of the problem.

3. As we have already partly indicated in our former expositions, it seems that Mycenaean Z- corresponds, when compared both with the proto-Greek situation and with the alphabetic post-Mycenaean one, to phones or phonic groups partly of voiced and partly of voiceless character, but we must add that only in some of the analyzed types it was possible to use also the S- spelling. We may in respect to these facts employ the following formulations:

a) In instances that are to be found under a, b, c, d of our paragraph 1 — i. e. in cases when the Mycenaean Z- is the mask of a continuation of the proto-Greek *j*-,²⁴ *-gj*-, *-g^wj*-, *-dj*-, that is to say in voiced phonic groups —, the Mycenaean substit-

utes for the just-said proto-Greek phonic formations are regularly reproduced with signs of the Z- series only.

b) In those instances that are to be found under e, f, g, h of our paragraph 1 — i. e. in cases when the Mycenaean Z- is the mask of a continuation of the proto-Greek *-kj-*, *-k^wj-*, *-tj-*, and *-tw-*, in other words, in cases of phonic formations with an initial voiceless element—either spelling may perhaps have been employed:

α) Z-: Of the examples quoted or at least alluded to under e, f, g, h of paragraph 1 a rather reliable interpretation may be perhaps attributed so far only to the expression *ka-zo-e* ≅ **kakjo(h)es* [with Z- for the proto-Greek *kj*],²⁵ the interpretations *ku-ru-zo* ≅ **glukjōn/glukjōs*, *ke-re-za* ≅ **Krētjai*, *zo-wa* = **twōwa* etc. being definitely less creditable.

β) S-: This is a more current Mycenaean spelling of the substitutes for the proto-Greek *-kj-*, *-tj-*;²⁶ cf. e. g. *wa-na-se-wi-jo* P^Y Fr 1215 ≅ **wanaktjēwio-* > *-kj-* [Adj. from **wanaktja* > *kja*, cf. Hom. ἄνισσῶ], further different adjectives ending in *-we-sa* ≅ **-wnjtja* > **-watja* [cf. χαρί-εσσῶ],²⁷ e. g. *mi-to-we-sa* KN Sd 0407. b+ ≅ *mitto-* [cf. Hom. μίλοπαρρηός] + **-watjai*, and above all the pronominal *to-so*, *to-sa* etc. ≅ **totjos* . . . [cf. the Attic τόσος. . .]. Thus we encounter here a graphical, mutually contrary pair of the type *ka-zo-e*: *wa-na-se-wi-jo* [both Z- and S- mask here the proto-Greek *-kj-*], and those who accept also the interpretation of the Mycenaean *ke-re-za* ≅ **Krētjai* will likely mention the analogical contrast *ke-re-za*: *mi-ti-we-sa*, as well [both Z- and S- were masks of the proto-Greek *-tj-*], the reality of the latter contrast not being quite sure, of course: this means that the opposers of the interpretation *ke-re-za* ≅ **Krētjai* are by no means bound, at least with respect to the proto-Greek *-tj-*, to accept the theory of unsteady use of Z- and S-spellings, feeling entitled to see in the S- spelling the only way of reproducing the proto-Greek phonic formation *-tj-*. But be it as it will with the *ke-re-za*,²⁸ there certainly exists one instance which would very likely make all research-workers willing to accept the S-spelling as the only possibility of reproducing the Mycenaean substitute for the proto-Greek *-tj-*, that is to say that particular type of this substitute which concerns the proto-Greek homomorphemic *-t(h)j-*,²⁹ [i. e. *-t(h)j-* containing the “morphologically unbound” *j* — see below], documented in Mycenaean just by the pronominal *to-so*, *to-sa* and so on. This homomorphemic *-t(h)j-* succumbed according to Risch³⁰ in the “South Greek” area,³¹ i. e. in fact the area of the proto-Ionic and the proto-Arcadian dialects,³² comparatively soon to a special assibilation, which along with another analogical pre-Mycenaean change, namely with the assibilation of the suffixal *-ti(-)* into *-si(-)* represents the first distinct differentiation of that Risch’s “South-Greek” type of dialects from the rest of the Greek-speaking world.³³ From this first assibilation, which, as we have pointed out, was accomplished in the said area of dialects only in such type of the phonic formation *-t(h)j-* in which *j* was “morphologically unbound” [cf. Attic-Ionic-Arcadian τόσος < **totjos*, μέσος < **methjos* < **medhjos* in contrast to the “morphologically bound” types ἐρέσσω/ἐρέπτω < *-tjō*, μέλισσα/μέλιττα < *-tja* < *-tjā*, κρε(τ)ιστων/κρε(τ)ιτων < *-tjōn* with their “inter-morphemic” *-t(h)j-*]²⁹, we have to distinguish according to Risch³⁴ the so-called second assibilation, which is supposed to have later affected all the remaining analogical proto-Ionic and proto-Arcadian phonic *j-* combinations; the proto-Ionic and proto-Arcadian areas, of course, excepting, this second assibilation was the only one that is said to have taken place elsewhere. This means that in the other areas the second assibilation affected, in fact, all the existing phonic combinations of explosives + *j* more or less simultaneously [i. e. it was only now

that the assibilation was accomplished there even in that homomorphic *-i(h)j-* with the morphologically unbound *j*]; thus it would seem that this lagging of the rest of the Greek dialects behind Risch's "South-Greek" group forms the real background to the well-known contrast of the Attic-Ionic-Arcadian *τόσος*, *μέσος*³⁵ and of *τόσσος*, *μέσσος* in the Aeolic and West-Greek dialects.³⁶

c) In those instances that were under *i*, *j* of paragraph 1, i. e. in cases when Mycenaean Z- is a continuation of the original *gi* + vowel [i. e. phonic group with voiced initial element], or maybe of the original *ki* + vowel and *k^wi* + vowel [i. e. phonic groups with a voiceless initial element], of the two ways of graphic reproduction it is again only the Z- spelling that can be documented quite irrespective of whether the initial elements of the original phonic groups were voiced or voiceless.

The fact that the Mycenaean signs of the Z- series obviously reproduced in some cases phonic groups with a voiceless initial element as well [cf. items e, f, g, h, j of paragraph 1] was, to be sure, for the first time stated by *Mühlestein* already in *Mus. Helv.* 12 (1955), 121, and since it was pointed out several times here and there, yet so far no desired phonemic conclusions respecting the number of Mycenaean phonemes of the sibilant shade have been drawn from it. Of course, it was especially *Lejeune*, *Minos* 6 (1958), 87sqq., who has approached the solution of this problem very closely at least from the purely phonetical point of view. Even though he may speak now and then of the phone masked by the Mycenaean sign Z- in the singular as of "*une siffilante forte*",³⁷ nevertheless, we may conclude from his other formulations, which were already alluded to here, that he feels inclined to acknowledge from the *phonetic* standpoint three Mycenaean sibilants in all, i. e. *siffilante forte sonore*, *siffilante forte sourde*, and *siffilante "normale"*.³⁸ His exposition, however, does not make clear one point, namely what view of the problem he takes from the *phonemic* standpoint, that is to say what answer he gives to the question in what functional mutual relationship were these three phonetic realizations, i. e. whether it is possible to ascribe all of them the character of independent phonemes, or whether some of them represented mutually only the relation of combinatory variants. The necessity of attempting to fix as precisely as possible the number of Mycenaean sibilant phonemes is today, in our opinion, all the more urgent since it seems that *Lejeune's* clear-sighted differentiation of the three Mycenaean phonetic sibilant realizations has so far found insufficient echo in synoptic studies of Mycenaean grammar, so that we still often read in these works about the Mycenaean "z" being the only phone contrary to Mycenaean *s*.³⁹

All this considered, we shall therefore undertake in the second part of the present study the task of attempting a systematic diachronical analysis of further development of all proto-Greek phones and phonic groups whose later continuation is hidden behind the Mycenaean signs of the Z- and S- series, trying at the same time partly to fix the total number of Mycenaean sibilant phonemes, and partly to determine as precisely as possible the phonic value of each.

Considering the fact that so far we have dealt systematically with the phonic aspect of the Z- series only, while referring to the corresponding problems of the S- series just occasionally, it will be necessary first to give a consummate picture of the characteristic features of the phonic application of both these Mycenaean graphic series side by side [in the case of the S- series we shall extend the picture by a more detailed description of its entire historical aspect]:

I. The Mycenaean Z- spelling is the only safely documented way of reproducing substitutes partly for the proto-Greek voiced phonic formations *j-*, *-gj-*, *-g^wj-*, *-dj-*

[see items a, b, c, d, in paragraph 1], and partly for products of a perhaps comparatively late assibilation, accomplished in the groups *gi*, *ki*, *k^vi* before a succeeding vowel [see items i, j in paragraph 1], i. e. in phonic formations with both, a voiced and a voiceless initial element.

II. A parallel use of either the Z- spelling or of the S- spelling with no difference in meaning implied may be documented with approximate safety only for the proto-Greek "voiceless" phonic formation *-k(h)j-*, while with an essentially lower probability perhaps also for the "voiceless" proto-Greek *-t(h)j-* with the morphologically bound *j*, that is to say for the inter-morphemic *-t(h)j-* [the homomorphemic *-t(h)j-* is, on the other hand, regularly reproduced with the S- spelling only, and that is why we include it in the next paragraph sub III 5].⁴⁰

III. The Mycenaean S- spelling is the only safely documented way of reproducing the substitutes for the following proto-Greek, or at least pre-Mycenaean phones or phonic groups:

1. *s*: e. g. ka-ke-u-si PY An 129.7 al. = *khalkeusi* [Dat. Plur. of an *eu*-stem substantive; cf. $\chi\alpha\lambda\kappa\epsilon\upsilon\sigma\iota$ from $\chi\alpha\lambda\kappa\epsilon\upsilon\varsigma$].

2. *t* in the suffix *-ti[-]*, esp. in the personal ending of 3. Plur.: e-ko-si KN G 820.1, PY very often = *ekhons(t)si* < **nti*; in the post-Mycenaean Greek dialects we find this *-si* only in Attic-Ionic, Arcadian-Cypriote (Pamphylian excepting) and Lesbian [cf. the Attic-Ionic, Arcadian and Lesbian spelling $-\Sigma$] and the Cypriote syllabic spelling $-si$]; nevertheless, the Lesbian *-si* is most probably due to the direct influence of Ionic of Asia Minor in the first centuries of the 1st millennium B. C.⁴¹

3. heteromorphemic *s + s*: e. g. e-ke-si-qe PY Jn 829.3 = *enkhes(s)i k^ve* [Dat. Plur. of a *s*-stem substantive; cf. $\epsilon\kappa\chi\epsilon\sigma\iota$ from $\epsilon\kappa\chi\omicron\varsigma$]; in the post-Mycenaean Greek dialects we find the analogical spelling Σ in Attic-Ionic and Arcadian, whereas the Aeolic and the West-Greek⁴² dialects have $\Sigma\Sigma$ or $\Theta\Theta$.⁴³

4. heteromorphemic *d + s*, *t + s*: e. g. pi-we-ri-si MY Fo 101.5 \cong **piweridsi* > *-s(s)i* [Dat. Plur. of a *d*-stem substantive; cf. $\Pi\acute{\iota}\epsilon\rho\iota\sigma\iota$ from $\Pi\acute{\iota}\epsilon\rho\iota\delta\epsilon\varsigma$]⁴⁴ or a-mo-si PY An 1282.1 \cong **harmntsi* > **motsi* > *--s(s)i* [Dat. Plur. of a (*m η*)*t*-stem substantive; cf. $\acute{\alpha}\rho\mu\alpha\sigma\iota$ from $\acute{\alpha}\rho\mu\alpha\chi$];⁴⁵ in the post-Mycenaean Greek dialects we find the analogical spelling Σ^{46} in Attic-Ionic and Arcadian, whereas the Aeolic and the West-Greek dialects have $\Sigma\Sigma$, or Z, TT, $\Theta\Theta$, T Θ .⁴⁷

5. homomorphemic *-t[h]j-*, i. e. *-t[h]j-* with the morphologically unbound *j*⁴⁸: e. g. to-so \cong **totjos* [see more above on p. 92sq.]; in the post-Mycenaean Greek dialects we find the analogical spelling Σ^{46} in Attic-Ionic, Arcadian and Pamphylian, whereas the Aeolic and the West-Greek dialects have $\Sigma\Sigma$, or Z, TT, $\Theta\Theta$.⁴⁹

Thus the whole complex of the Mycenaean situation with its presupposed proto-Greek sources and the documented typical parallels in Classical Greek dialects may roughly be summed up in the following table (*-gia-*, *-kia-*, *-k^via-* excepted):^{49a}

assumed proto-Greek source	<i>s</i>	<i>s + s</i>	<i>d + s</i>	<i>t</i>	<i>t(h)j</i>	<i>t(h)-j</i>	<i>k(h)j</i>	<i>tw</i>	<i>j-</i>	<i>dj</i>	<i>gj</i>
				<i>t + s</i> in <i>-ti</i>	HM	IM					
Mycenaean spelling	S	S	S	S	S	S/Z?	S/Z	/Z?	Z	Z	Z
Cypriote spelling	S	?	?	S	?	($\Sigma\Sigma$)	($\Sigma\Sigma$)	?	?	Z	Z

	s	s+s	d+s t+s	-ti	t(h)j	t(h)-j	k(h)j	tw	j-	dj	gj
Arcadian	Σ	Σ	Σ	Σ	Σ	ΣΣ	ΣΣ, T?	ΣΣ	Z	Z	Z
Pamphylian	Σ	?	?	T	Σ	Σ?	ψ	?	Z	[Z]	[Z]
Ionic of A. M. and of Cycl.	Σ	Σ	Σ	Σ	Σ	ΣΣ	ΣΣ T	ΣΣ T	Z	Z	Z
Attic-Euboean	Σ	Σ	Σ	Σ	Σ	TT	TT	TT	Z	Z, ZΔ ΣZ, Σ	Z
Lesbian	Σ	ΣΣ?	ΣΣ	Σ	ΣΣ	[ΣΣ]	ΣΣ	[ΣΣ]	ΣΔ [Z]	ΣΔ Z	ΣΔ [Z]
Thessalian	Σ	ΣΣ	ΣΣ TΘ	T	ΣΣ	ΣΣ	ΣΣ	ΣΣ TT	[Z]	Z ΣZ ΔΔ	[Z]
Boeotian	Σ	ΣΣ	TT	T	TT	TT	TT	TT ΣΣ	ΔΔ	ΔΔ	ΔΔ
Elean	Σ	[ΣΣ]	[ΣΣ]	T	ΣΣ	ΣΣ	[ΣΣ]	[ΣΣ]	ΔΔ TT	Z ΔΔ TT	[ΔΔ]
Laconian	Σ	ΣΣ	ΣΣ	T	ΣΣ	ΣΣ	ΣΣ	ΣΣ	ΔΔ	ΔΔ TT	[ΔΔ]
Central Cretan	Σ	ΘΘ	Z [TT] ΘΘ	T	Z TT ΘΘ	Z TT ΘΘ	TT ΘΘ	TΘ	Z ΔΔ TT	Z ΔΔ TT	Z ΔΔ TT
Remaining Doric	Σ	ΣΣ	ΣΣ	T	ΣΣ	ΣΣ	ΣΣ	ΣΣ	Z	Z, ΣZ	Z

The very fact, that in the Mycenaean spelling usage we may discern, as we can see from the table, the Z- spelling, S- spelling, and the unstable S-/Z- spelling, is conspicuous, implying an assumed possibility of dividing the whole Mycenaean "S-/Z-" articulation area into three phonemic units. It is especially that rather distinct restriction of the unstable S-/Z- usage to a certain type of original phonic formations which makes us suspect the existence of following situation: There actually may have been only two reproductions available for three Mycenaean phonemic units, and the graphic practice may have been here similar to that which we encounter, let us say, in the Elean vocal system. In the latter, namely, the original long \bar{a} [as well as any \bar{a} -product of compensatory lengthening or of contraction] is expressly reproduced with the letter A, the secondary \bar{e} originating from compensatory lengthening and contraction is reproduced only with E [or later with H], while for the original \bar{e} , which was probably pronounced like open \bar{e} , or \bar{ae} , both ways of reproduction are used.

The above-mentioned suspicion would not, of course, necessarily be ascribed any extra importance, yet the existence of a quite analogical three-fold division of the same articulation area in Classical Arcadian, Attic-Ionic, and possibly also in Pamphylian, tends to substantiate it. A mere glimpse at our table tells us that the Mycenaean spelling was closely related to Classical Arcadian and Attic-Ionic spellings, and perhaps also to Pamphylian spelling as well.⁵⁰ where Arcadian, Attic-Ionic, and partly also Pamphylian have Σ, Mycenaean uses expressly S-, where we find Z in Arcadian, Pamphylian [and as a rule also in Attic-Ionic], Mycenaean regularly puts Z-, and finally the use of ΣΣ in Arcadian and of ΣΣ or TT in Attic-Ionic [or maybe of T in Ionia and of ψ in Pamphylia] finds roughly its counterpart in the unstable S-/Z- spelling in Mycenaean. (In addition to it we meet in Myce-

naean with the Z- spelling even in those places in which Classical Greek has preserved as a rule the original *ki*, *k^wi*, *gi* before a succeeding vowel.) These remarkable and conspicuous analogies make us draw the following conclusion: Granted that in the Arcadian, Pamphylian, Attic-Ionic, and maybe also Cypriote, area there existed in the Classical era a difference between substitutes for the intermorphemic *-t(h)j-* [i. e. *-t(h)j-* with the morphologically bound *j*] and for each *-k(h)j-* and *-tw-*, on the one hand, and the then-existing continuation of the homomorphemic *-t(h)j-* as well as of the original *s* and of the heteromorphemic groups *s + s*, *t + s*, and *d + s*, on the other hand, this being granted, as I say, we may in our opinion count with the existence of a similar difference in the Mycenaean era as well —especially if Mycenaean is really connected directly with Arcadian-Cypriote. It is namely improbable that any of the before-said phones or phonic groups should have first [at some time in the Mycenaean era] been joining in one way or other and later again disjoining so as to represent all together in the Mycenaean era a smaller number of separate phonemic units than they represented in the said dialects in the Classical era.

It seems therefore that the S- signs were regularly employed in the Mycenaean era both for the original *s* and for those phonic formations that by the dawning of the Mycenaean era either had directly fused with the phone *s*, or at least had very closely approached it, assuming maybe the character of *ss*. This may serve as an explanation of the fact that the Mycenaean S- comprises also the groups *s + s*, *t + s*, *d + s* and also a product of the very old assibilation of the homomorphemic *-t(h)j-* [even this product had by this time assumed at least the form *ss*, if not even *s*].

On the other hand, the Z- signs were regularly employed in the Mycenaean era for those phonic formations whose character was originally determined by palatalization and which were just passing in the Mycenaean era through the initial stage of their assibilation process, so that it was still possible to use for their reproduction that special series of Linear signs whose opening consonantal component had the phonetic value of some palatalized velar or dental explosive at the time when the Linear Script was being adopted for rendering Greek, i. e. the series which has been designated very inadequately as the "Z- series". Nevertheless, the act of putting the Z- spelling into practice consisted in our opinion of two quite separate phases:

1. It is probable that the very adoption of the Linear Script for rendering Greek witnessed already the tendency of reproducing with the Z- spelling all phonic formations governed by the so-called second assibilation, i. e. the voiced substitute for the original *j-*, *-dj-*, *-gj-*, on the one hand [this substitute being very likely at that time not far from the affricate *dʒ* going back to *d'd'*], and the voiceless substitute for the inter-morphemic *-t(h)j-* or for any *-k(h)j-* and *-tw-*, on the other hand [the latter substitute being again probably not far from the affricate *tʃ* going back to *t't'*]; in either of these cases the Z- series of signs was employed just to express rather the purely palatal, i. e. the still non-affricate, shade of the two substitutes, a shade that was just in all probability disappearing. Why also the voiceless substitute was reproduced in this way and not with the S- spelling, as one might expect, is clear enough: this voiceless sound, that but shortly before had very likely been displaying a full, non-affricate palatal shade as well, was at that time still too far from representing the phonetic quality *s*, being at the same time bound up with its voiced counterpart into one specific couple—shortly before still fully palatal—too closely to be reproduced by the S- signs which were exclusively sibilant in character.

2. After the fashion of the second assibilation also the "hiatus assibilation" was accomplished in the phonic groups *ki*, *k^{vi}i*, *gi* before a succeeding vowel, this taking place rather later, probably about the time when our Mycenaean documents originated. Thus new values *tj* and *dz* came into being, and because the second assibilation had, as we may assume, by that time already been finished, it is open to question whether this newly arisen *tj* and *dz* actually fused with the earlier *tj*- and *dz*-products of the second assibilation. Considering the fact that the Mycenaean spelling when demonstrating the products of the second assibilation uses either Z- or S-, whereas when reproducing in Mycenaean texts the products of the "hiatus assibilation" it adheres regularly to the Z- signs, one may with great probability conclude that these very new assibilation products had not fused with the products of the second assibilation, on the contrary, that they found them already assuming the places of *ts*, *dz* — as far as they themselves did not contribute to their displacement. This would, of course, hold good especially if we can assume that all the previous *ts*, gradually originating from various sources [from *t* in the suffixal *-ti(-)*, from the homomorphemic *-t(h)j-*, as well as from *d + s*, *t + s*] had by that time positively been shifted further to *ss*, or maybe even to *s*. This assumption seems to be very probable as every Mycenaean continuation of all the just-mentioned phonic formations really is, in contrast to the products of the second assibilation, quite regularly reproduced with signs of the S- series.

In this situation—the products of the second assibilation having most likely already assumed by that time the affricate character *ts*, *dz* — a new way of reproducing the voiceless product of the second assibilation possibly came into being: since signs of the S- series covered regularly only voiceless phonic qualities, Mycenaean scribes, considering the excessive overloading of the Z- series, started applying the S- signs also to the reproduction of the voiceless *ts*, arisen formerly in the course of the second assibilation from the intermorphemic *-t(h)j-*, from any *-k(h)j-*, and from *-tw-* [the phenomenon was limited to *ts* only, for the latter—in contrast to its predecessor *tj*—was already sufficiently resembling the sound *s* in articulation, whereas the parallel sound *dz* — just on account of its voicefulness—evidently produced a different impression, and thus the exclusive reproduction with signs of the Z- series was maintained here].⁵¹ The divergent practice in the graphic reproduction of the products of the original intermorphemic *-t(h)j-*, of any *-k(h)j-*, and of *-tw-*, as we postulate it for the preserved Mycenaean documents, would thus be an outcome of a contamination of the original spelling from an early stage of the springing up Linear Script B—when consideration of the common, recently still prevailing palatal non-affricate shade of the substitute for most⁵² of these phonic formations predominated over the respect for their voicelessness—with later graphic tendencies (from the time of the preserved Mycenaean documents), which gave rise to a phenomenon somewhat strange in the light of Mycenaean usage, namely an endeavour to join in one graphic series two independent phonemic units of different articulation position, but of the same character as to voice [in contrast to it, it was more usual in the Linear Script B to join the Greek phonemic units with the same articulation position by one and the same series of graphic reproduction, quite irrespective of their being voiced or voiceless].

At the same time our theory of the more ancient origin of the practice to reproduce voiceless products of the second assibilation with the Z- series, when compared to the same application of the S- signs, finds in our opinion a substantiation in the fact that the voiceless product of the "hiatus assibilation" is reproduced with

the Z- spelling quite consistently (the product in question being the affricate Mycenaean substitute for $ki + \text{vowel}$ or $k^v i + \text{vowel}$, whose origin must evidently be ascribed a younger date than the origin of an analogical product of the second assibilation), this graphic usage finding most likely its example just in the originally equally consistent reproduction of the voiceless product of the second assibilation with the Z- series. It is true, a theoretical admission would have to be made that the voiceless product of the second assibilation may after all have been reproduced with the S- signs from the very beginning, the Z- spelling figuring here as merely a secondary anomaly [all the more since the latter can be safely documented for the voiceless product of the second assibilation quite rarely, the interpretation of even these instances being often rather problematic on the top of it], yet, on the other hand we can hardly imagine the principle of distinguishing the affricate voiceless formation from its correlative voiced phonic formation by means of the S- signs as asserting itself during the earlier stages of the second assibilation, while its voiceless product was still very far from assuming the phonic position of s , and the younger "hiatus assibilation" altogether failing to follow suit. Due to these facts a simpler process of reasoning appears to be to take in the case of products of the second assibilation the failure of distinguishing voiced from voiceless for granted at least in the initial LB-stage. The said distinguishing was evidently only a secondary phenomenon, occurring most probably as late as after the origination of the "hiatus assibilation". It seems therefore that we would have to accept in the long run the hypothesis of the original graphic reproduction of the voiceless product of the second assibilation with the Mycenaean Z- spelling, even should we be forced, owing to problems of interpretation, to discredit the most important argument speaking in favour of the Z- series reproducing the voiceless product of the second assibilation, i. e. the traditional interpretation of the Mycenaean expression $ka-zo-e \cong *kakjo(h)es$.

Thus we are coming to the conclusion that at the time of the preserved Mycenaean texts the Mycenaean sign S- was masking at least two different phonetical values having probably the validity of independent phonemes, i. e. the original s , on the one hand, reinforced by the products of the heteromorphemic $s + s$, $t + s$, $d + s$ and very likely also by the early product of the first assibilation of the proto-Greek homomorphemic $-t(h)j-$ as well as by the substitute for t of the suffixal $-ti(-)$, while on the other hand, the later voiceless product of the second assibilation, assuming approximately the phonetic form of ts . The phonemic independence of both these sounds may be derived from the fact that they may occur in the same places in a word [cf. to-so = *tosos* (in the common transcription) beside mi-to-we-sa = (in our new transcription) *millowetsa*]. When saying that there must have existed at least two different phonetical values, we thought also of the following possibility: the position s may not have been quite assumed yet by that time partly by the product of the first assibilation of the proto-Greek homomorphemic $-t(h)j-$, or maybe neither by the substitute for t of the suffixal $-ti(-)$, nor perhaps by the substitutes for the heteromorphemic $s + s$, $t + s$, $d + s$; but we should not like to stress this possibility, because there is no trace in Mycenaean of such a difference; it may be postulated for the Mycenaean era, to be sure, yet sufficient reasons for such a postulation could not be offered.

The Z- series of signs, on the other hand, masked partly dz as a voiceless product of the second assibilation, and partly also the quite recently arisen affricates tj , dz , these again being products of the "hiatus assibilation", accomplished in phonic

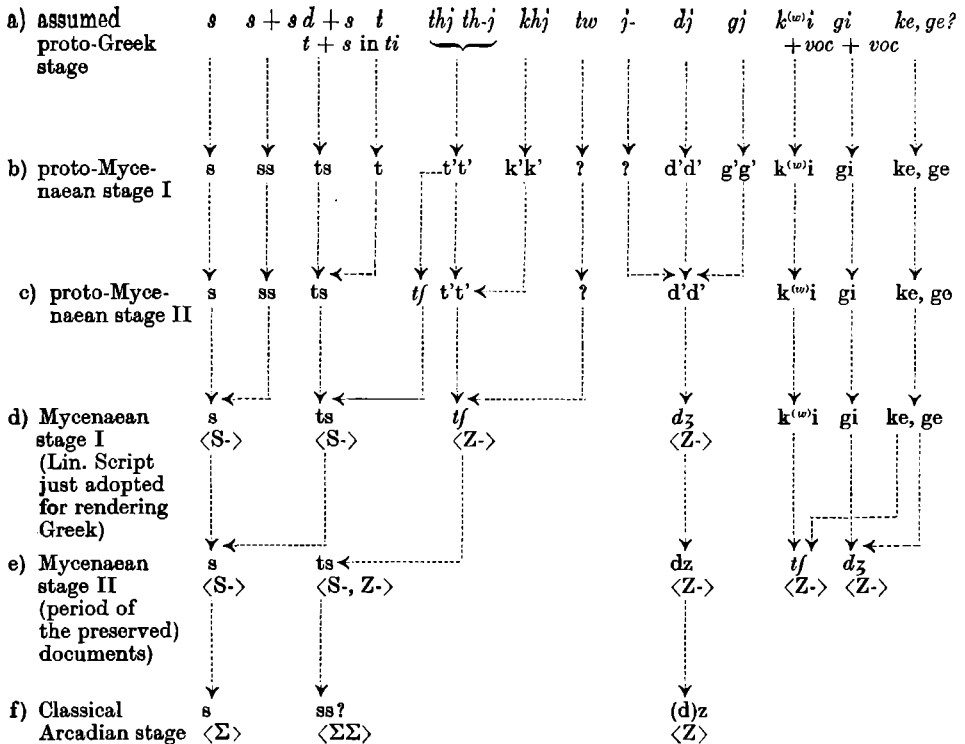
groups *ki*, *k^xi*, *gi* before a succeeding vowel. One has, however, the impression that of the three phonic realizations it was only *dz* that represented an independent phonemic unit [in favour of its phonemic independence, in comparison with *ts*, speaks the fact that either *dz* or *ts* may occur in the same places in a word (cf. *me-zo* = *medzō*- [in our new transcription] and *mi-to-we-sa* = *miltowetsa*)]. As to the *tj*- and *dz*-products of the "hiatus assibilation" in the groups *ki* + vowel, *k^xi* + vowel, *gi* + vowel, we feel rather perplexed when thinking of ascribing them the character of independent phonemic units, for here, as it appears, we have to deal with what originally were mere affricate combinatory variants of the velar *k*, *g* before the succeeding hiatus *i*,⁵³ even if in the course of time—subsequent to the probable and presupposed absorption of the said *i*—also this *tj*, *dz* was well prepared to turn into an independent phoneme; the question, however, is still to be answered whether this phonemization had time enough to be actually accomplished in Mycenaean.—This exposition wants another remark to add: it concerns *tj*, which as a combinatory variant of the velar *k* found in Mycenaean a chance of playing a role evidently also in the phonic combination *k* + *e*; indications thereof we find in instances of variegating spelling KE and ZE, no change of meaning being probably implied [see *a-ze-ti-ri-ja* KN E 777. r al. beside *a-ke-ti-ri-ja* KN Ai 739 al. \cong **akestria*?; cf. also Note 8]. For *dz* as a substitute for the original *g* before *e* we have no such documentation, which, of course, does not mean that the actual existence of such a situation should altogether be excluded.

As for the whole number of the Mycenaean continuants of affricate or sibilant character, both voiced and voiceless, we may, therefore, conclude that we encounter here at least three independent phonemes:

1. The phoneme *s*, having no voiced phonemic counterpart [its voiced counterpart *z* existed only as a combinatory variant of the phoneme *s* when occurring before voiced consonants in expressions such as the Mycenaean, though undocumented, yet perhaps rightly assumed **ozdos*, cf. Attic $\delta\zeta\sigma\zeta$ or German *Ast*], and having already absorbed the monomorphemic *-t(h)j-*, which, as we have to assume, of course, passed through a long process of evolution from the presupposed original *-t(h)j-* through *t't*, *tj*, *ts* [here it absorbed the original *t* from the suffixal *-ti(-)* and further also the heteromorphemic *d* + *s*, *t* + *s*], and then passing through the stage of *ss* [here it again absorbed the heteromorphemic *s* + *s*] it finally assumed the form *s*—maybe as early as within the Mycenaean era.

2—3. The couple of affricate phonemes *ts*, *dz*, which formed counterparts as to voice. Their phonetic character underwent the following pre-Mycenaean and Mycenaean process of evolution: from various original formations through *t't* [which absorbed also *k'k'*] and through *d'd'* [absorbing also *g'g'* and evidently even a part of the initial proto-Greek *j-*],⁵⁴ then through *tj* [which had very likely directly absorbed the original *tw*] and through *dz*, assuming finally the forms *ts*, *dz*.⁵⁵

To survey our views of the most probable evolutionary stages of these phonemes—their prospective development in the Classical era including—we have supplied the reader with the supplemented synoptic table, summing up the essential pieces of information as well as our foregoing argumentation:



NOTES

¹ The signs ZI and ZU could so far not be quite precisely identified; the sign ZU may be identical with the rarely occurring sign No. 79, but this is not quite sure and some scholars transcribe this sign as ZI [e. g. *L. R. Palmer*, *Bull. of the Institute of Class. Stud. of the University of London* 2 (1955), 43].

² The Linear B inscriptions are quoted according to the following works: *E. L. Bennett*, *The Pylos Tablets, Texts of the Inscriptions Found 1939–1954*, Princeton 1955 (abbreviation PY), *E. L. Bennett, J. Chadwick, M. Ventris, F. W. Householder*, *The Knossos Tablets*,² *Bull. of the Class. Stud. of the Univ. of London*, Supp. No. 7, London 1959 (abbreviation KN), *E. L. Bennett*, *The Mycenaean Tablets II*, *Trans. of the Amer. Philos. Soc.* 48, 1, Philadelphia 1958 (abbreviation MY) and *G. Pugliese Carratelli*, *Le iscrizioni preelleniche di Haghia Triada in Creta a della Grecia peninsulare*, *Monumenti Antichi*, vol. XL 4, Milano 1945 (from this work only one inscription – found in Thebes – is quoted here: abbreviation TH).

³ Considering the fact that we are only going to find out what phonic quality, or what phonic qualities are concealed behind the Mycenaean Z-, we do not give in our interpretations of the Linear B expressions the Mycenaean pronunciation, but the presupposed proto-Greek pronunciation: our “ze-u-ke-u-si \cong *jeugeusi” means that the quoted Linear form ze-u-ke-u-si corresponds with the hitherto not quite precisely known Mycenaean pronunciation of the assumed proto-Greek *jeugeusi.

⁴ As for the proto-Greek *khj*, *k'hj*, *thj*, no reliable Linear B examples of the Mycenaean continuation of the same phonic formations were found so far [see e. g. the highly problematic interpretation di-so KN Sc 255 \cong **Dikhjos*]. That is why we prefer here to speak only of *kj*, *k'j*, *tj*. Of course, in the following parts of the present study we shall often have to employ the graphic indication *k(h)j*, *k'(h)j*, *t(h)j* when speaking about the proto-Greek sources of Greek affricates and sibilants in general.

⁵ Owing to the alphabetic form $\kappa\alpha\lambda\acute{\iota}\omega\nu$ with its vocalic *i*, the Linear B sign-group ka-zo-e

might be also inserted into our paragraph j below, this eventuality being, however, from the Mycenaean point of view less probable [see the already quoted *me-zo* \cong **megjō*- (cf. *μείζων*, *μείζων*), and especially the variant pair *me-u-jo/me-wi-jo* KN and PY often \cong **me(i)wjd*- (cf. Att. *μείων*), the most probable suffix being here *-jos-* in general (see *Vilborg* 98).

⁶ See already *Ventris-Chadwick*, Documents 162.

⁷ As for the original *-dia-* and *-(h)ia-* with hiatus *i*, the respective examples [cf. *za-ki-ri-jo* KN Vc 108 with *Δι-άκλειος* and *pu-za-ko* PY Cn 328.14 with *Πυθι-αρχος*] are extremely problematic.

⁸ Cf. also the ZE/KE- oscillation in expressions like *a-no-ze-we* PY Cn 600.13 and *a-no-ke-we* PY An 192.13, KN Db 1261. B al.; this phenomenon shows that there was a certain relation between the sound or sounds masked by the Mycenaean Z- and between the pronunciation of the original *k* when it was followed by *e*.

⁹ In PY Er 880.6, on the other hand, the reading of the second sign is not quite certain.

¹⁰ But cf. the hiatus-spelling in the cognate *ka-ki-jo* KN So 894.2 \cong **khalkiō* (Nom. Du.).

¹¹ In accordance with Stang's and Diver's hypothesis [cf. *Chr. S. Stang*, *Quelques remarques sur le système consonantique du grec commun*, *Symb. Osloenses* 33 (1957), 27–36, and *W. Diver*, on the Prehistory of Greek Consonantism, *Word* 14 (1958), 1–25] of the proto-Greek combinations *kj*, *tj*, *gj*, *dj*, etc. being at first changed into the geminated *k'k'*, *t't'*, *g'g'*, *d'd'* etc., we think that the assumed two phonemic units were *t't'* and *d'd'* [cf. *A. Bartoněk*, *Vývoj konsonatického systému v řeckých dialektech* = Development of the Consonantal System in Ancient Greek Dialects, Praha 1961, pp. 166].

¹² In this place—as well as in all the following parts of our present study—we prefer to write *-gj-*, *-g'gj-*, *-dj-*, *-tw-* etc. instead of the more complicated *(-)gj-*, *(-)g'gj-*, *(-)dj-*, *(-)tw-* etc. as employed in the paragraph No. 1.

¹³ See Table on p. 94sq.

¹⁴ *I* is the older form of the sign Z.

¹⁵ The sign *F* was regularly used instead of *I* or *Z* in several epichoric alphabets.

¹⁶ The most important exceptions: Central Cretan, Boeotian, Laconian, Elean and the Thessaliotic subdialect of Thessalian with their *ΔΔ*, or later *ΤΤ*—all this being, of course, only a special continuation of the affricate *dz*. See *A. Bartoněk*, *Vývoj* 145 sqq.

¹⁷ The more important exceptions: Central Cretan, Boeotian, Attic and Euboean with their *ΤΤ*, or later sometimes *ΘΘ*, *ΤΘ*, all this being again only a special continuation of the affricate *ts* (see op. cit. in Note 16).

¹⁸ The said spelling *Σ* is typical for Attic-Ionic as well as for the whole Arcadian-Cypriote group of dialects (Pamphylian including), masking here, however, only a special type of the proto-Greek *-(h)j-* [see more on p. 92 sq.]; in other cases the geminated *ΣΣ* is used even in the above-said dialects.

¹⁹ The sign *T* is used several times instead of the expected *ΣΣ* in the Ionic of Asia Minor, the only Arcadian example of the same being, on the other hand, highly problematic.

²⁰ The sign *Ψ* is used several times instead of the expected *ΣΣ* in Pamphylia.

²¹ See *Thumb*—*Scherer* 89.

²² In this place—as well as in the following parts of the present study—we use the expression “sibilant” in the sense of “affricate-sibilant”.

²³ See *Lurja*, *Jazyk* 56. — Nevertheless, according to our opinion, this may be nearly true for some special cases of the Z- spelling, i. e. for the Mycenaean continuation of the original groups *kia*, *k^wia*, *gia* and for the Mycenaean *k* before *e*. See more on p. 99.

²⁴ Proto-Greek *j-*, of course, was changed also into *h-* in a number of words.

²⁵ See, however, also Note 5.

²⁶ For proto-Greek *tw* and *k^wj* we have no reliable S- documentation in Mycenaean; anyhow, even the Z- documentations were, as we have already said, rather uncertain.

²⁷ The Mycenaean *-we-sa* has, of course, of course, logical *e* instead of *a* or *o*, these vocal qualities being regular Greek outcomes of IE *η*.

²⁸ Cf. e. g. *Lejeune's* doubts in *Minos* 6 (1958), 131.

²⁹ As for the expressions “homomorphic” and “inter-morphic” *-(h)j-* see *W. S. Allen*, *Some Remarks of Palatalization in Greek*, *Lingua* 7 (1958), 113–133, esp. p. 125.

³⁰ See *E. Risch*, *Die Gliederung der griechischen Dialekte in neuer Sicht*, *MH* 12 (1955), 61–76, esp. pp. 66 sqq.

³¹ The same area is called “East-Greek” in *W. Porzig's* study *Sprachgeographische Untersuchungen zu den griechischen Dialekten*, *Indg. Forsch.* 61 (1954), 147–169.

³² The expression “proto-Ionic” has here the sense “proto-Attic-Ionic”, the expression “proto-Arcadian” has the sense “proto-Arcadian-Cypriote”.

