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L. J. D. RICHARDSON: *Agma*, a Forgotten Greek Letter. (Reprinted from *Hermathena* lvii.) Pp. 15. Dublin: Hodges, Figgis & Co., 1941. Paper, 6d.

IN this interesting and informative paper, Mr. Richardson is concerned primarily to show that *ᾄγμα*, the name for γ used as the symbol for the guttural nasal (as in *ᾄγγελος*), is not the same as the word *ᾄγμα* meaning 'fragment'. The term *Agma* was certainly first used by some grammarian; but whether he invented it by the somewhat complicated and not altogether convincing process suggested by Mr. R. or was attracted by the actual word *ᾄγμα* because it contained the sound in question and was approximately *γάμμα* with the first two letters transposed, who shall say? A more important question, to my mind, is how γ came to represent the guttural nasal. Most authorities hold that by assimilation in words like *ἄγνός*, *ἄγμός*, *ᾄγμα*, γ became nasalized and then the same symbol was used to express the similar nasal in words like *ᾄγγελος* (previously, according to this view, spelt *ἄνγγελος*). It is a little difficult to see what attitude Mr. R. adopts towards this question. I should add that *Agma* has not been so completely forgotten as Mr. R. suggests, although he can certainly refer to a long list of writers who do not mention it. He is a little unjust to Hirt, who does mention it on p. 206 of his *Greek Grammar*; and also to Brugmann, who discussed it in *Curt. Stud.* 4, 103. It receives adequate treatment in Brugmann-Thumb, p. 85; Schwyzer devotes considerable space to it in *Griech. Gramm.* i. 214, 215, and, in English, a good account will be found in Sturtevant, *Pronunciation*², pp. 64, 65.

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Trinity College Dublin

[57]

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AGMA, A FORGOTTEN GREEK LETTER.

THE new edition of Liddell and Scott has the following article:—

“ ἄγμα, τό (ἄγνυμι) *fragment*, Plu. *Phil.* 6; *fracture*, Pall. in *Hp.* 12. 27 IC. II = κλέμμα, Hsch. III = *nasalized g*, Ion ap. Prisc. *Inst.* 1. 39.”¹

This is an improvement on the entry in the 8th edition, which briefly reads “ ἄγμα, τό (ἄγνυμι, ἔαγα), *a fragment*, Plut. *Philop.* 6,” in that it now records the use of the word as a phonetic term. But it is also misleading: for it implies that the word in the sense ‘nasalized g’ is derived from ἄγνυμι. This *may* be its origin, and it is true that a case of sorts could be argued for the semantic connection: agma, *i.e.* the first ‘γ’ in ἄγγελος, might be described, I suppose, as a ‘broken’ sound, in as far as the contact which the tip of the tongue makes with the palate in *n* is not established in *ng* (γϞ)—compare ἀν-γελος with ἄγγελος. But this nomenclature would be based, in reality, on a perversion of the facts: failure to make contact is not a broken contact. I prefer to regard ἄγμα III as an entirely different word, owing its origin to the sound it connoted. It is thus an onomatopoetic label and takes its due place among the other similarly formed members of the alphabetic hierarchy.

When the γράμματα Καδμήϊα (or Φοινικίῃα)² took on Hel-

¹ This account is amplified by further citations under I in the final *Addenda et Corrigenda* (Part X).

² Herodotus, V, 58–9.

lenic denizenship, the naturalisation of their names was not completely successful, as they remained indeclinable. The names of the Greek alphabet were, in fact, curiously simple-complex: they were, in the first place, primitive onomatopoes; they were nouns, yet inorganic entities akin almost to interjections; they were also, in origin, Semitic nouns with objective meanings ('ox,' 'house,' 'camel,' etc.), but for the Greeks they must have been quite meaningless; they were rough-hewn into the image of Greek neuter nouns,³ yet they remained impatient of declension. I do not know if the part played by the word *γράμμα* in this re-shaping of a borrowed system has been pointed out: but it seems to me likely that *γράμμα*, a 'key-word' as well in meaning as in form, set the fashion by suggesting *γράμμα* as the Hellenised reincarnation of the Phoenician or Aramaic⁴ name which appears in the closely related Hebrew and Syriac as גִּמְלָה, גִּמְלָה (*gāmāl*, *gīmel*) and ܓܘܡܠ (*gomal*). The type thus established, the other pseudo-*mn*-neuter disyllabic forms followed by analogical levelling, *aleph* becoming ἄλφα, *bēth* βῆτα, etc. Analogy certainly played a strong part among such unanchored elements. ἦτα and θῆτα (from *hēth* and *tēth*) gave ζῆτα (from *zayin*): πει (from *pē*) gave ξει, φει, χει, ψει (new non-semitic letters). An ancient Greek phonetician, then, analysing ἄγγελος and seeking to put an alphabetic name of

³ A tendency probably assisted by the fact, pointed out by Canon Isaac Taylor (*Alphabet*, Vol. II, p. 24, ed. 1883), that the Semitic speech with which the Greeks first came into contact was a dialect of, or more akin to, Aramaic. Aramaic had an emphatic extension of the root ending in *-ā*, with the vowel in the preceding syllable dropped. The Hebrew *gīmel* would thus appear as *gimlā*.

⁴ I am not raising the difficult question of the identification or localisation of the contacts. It is generally agreed that there were probably more than one, and at different times. A useful summary of recent controversy on this subject will be found in M. N. Tod's 'Progress of Greek Epigraphy, 1933-4' in the *Journal of Hellenic Studies*, LV, 1935, pp. 176-8.

this pattern on the nasalized guttural $\gamma\textcircled{\text{a}}$ represented conventionally in writing by the first γ , would naturally call it $\gamma\textcircled{\text{a}}\text{-}\mu\alpha$, i.e. ‘ $\gamma\gamma$ ’- $\mu\alpha$, which would become (or be written) $\text{ᾗ}\gamma\gamma\mu\alpha$ or $\text{ᾗ}\gamma\mu\alpha$.⁵

Here two confirmatory points must be observed. 1. The ‘sonant’ in $\gamma\textcircled{\text{a}}\text{-}\mu\alpha$ is helped out by α , agreeably to the universal rule of Greek phonology (both ‘pre-ethnic,’ e.g., ἄδικος for $*\eta\text{-}\delta\text{ikos}$, and later, e.g., Hdt.’s κεχωρίδεται ⁶ for $*\text{κεχωριδνται}$). 2. $\text{ᾗ}\gamma\mu\alpha$ with one γ probably at one time represented the sound of $\text{ᾗ}\gamma\gamma\mu\alpha$ (or later of something very close to it, perhaps even ἄμμια). Cf. Wright, *Greek Grammar*, § 189, “medial $\gamma\nu$, $\gamma\mu$ became $\gamma\textcircled{\text{v}}$, $\gamma\textcircled{\text{m}}$, as in $\gamma\text{ιγνῶσκω}$, $\gamma\text{ίγνομαι}$, ἄγμός . At a later period $\gamma\textcircled{\text{v}}$ was simplified to ν , as $\gamma\text{ινῶσκω}$, $\gamma\text{ίνομαι}$.” And in § 155 he writes ἄγμός as ἀγμῶς . But this is a debatable question in Greek pronunciation, and is still more vexed in Latin (see Buck, *Comparative Grammar*, § 198 b, for a brief summary of arguments for and against Latin gn as $\gamma\textcircled{\text{n}}$). In the absence of a diacritical mark such as the tilde or of special letter-symbols as in Sanskrit such variations in nasal quality must remain uncertain.

In crying ‘distinguo’ between two words $\text{ᾗ}\gamma\mu\alpha$ I am suggesting no more than what already obtains in στίγμα . There is 1 στίγμα , from στίζω , and 2 στίγμα (or στίγμᾱ), an alphabetic name which arose much later for the ligature ς (= $\sigma\tau$). Likewise, it is only a chance that no declinable noun σίγμα from σίζω happens to be recorded (as have been σιγμός and σίξις), to stand beside the onomatopoeic and

⁵ I suggest that the particular ending chosen ($-\mu\alpha$) came from the association with $\gamma\acute{\alpha}\mu\mu\alpha$, as $\text{ἄ}\gamma\mu\alpha$ and $\gamma\acute{\alpha}\mu\mu\alpha$ were so often combined in $-\gamma\gamma\text{-}$ (= $\gamma\textcircled{\text{a}}\text{-g}$).

⁶ Mr. Gordon Quin reminds me that a more exact analogy is provided by the Greek treatment of $*r$ and $*l$, which with the auxiliary vowel a become $\alpha\rho$, $\rho\alpha$ and $\alpha\lambda$, $\lambda\alpha$.

indeclinable⁷ *σίγμα* (or *σίγμα*). By an unlucky perversity of human oversight *σίγμα* is the only alphabet-name which Boisacq fails to discuss in its place in his *Dictionnaire étymologique* (3rd ed., 1938): I have little doubt, however, that, while *σίγμα* is not a direct noun-formation from *σίζω* but is primarily onomatopoeic, it probably came, when it was licked into Greek shape with final *-a*, under the influence of a potential *σίγμα* from *σίζω*, especially if it was already carrying with it a feeling for mu conjoined with a guttural from a recollection of the Semitic *sāmekh*.⁸

A word should be said here about the sound *agma* itself. In combination a nasal tends to take its quality from the succeeding consonant (*e.g.*, *impellere*; *amita* but Old French **ante*, Eng. *aunt*). Brugmann (I, § 189) states that the parent Indo-European possessed four different kinds of nasals; labial *m*, dental *n*, palatal *ñ* (corresponding to his palatal guttural *ê*) and velar *ŋ* (corresponding to *g*). Sanskrit—as well as

⁷ *Σίγμα* does not seem to be generally declinable before Eustathius (twelfth century). Eustathius has, in addition to case-forms like *σίγματος* and *σίγμασιν*, such symptomatic derivatives as (Εὐριπίδης δ) *φιλοσίγματος* and *σιγματίζω*. On the other hand, *σιγματοειδής*, 'crescent-shaped,' was earlier: but in some cases this may be a false reading for the alternative *σιγμοειδής*. It is instructive that *γαμμοειδής*, *δελτοειδής*, *λαβδοειδής* are found, not *γαμματοειδής*, κ.τ.λ. (Incidentally, note that *αλφοειδής*, *αλφώδης* was a medical term of different origin, coming from *αλφός*, 'leprosy'.) It is certain, then, that *σιγμοειδής* was the earlier and more 'regular' formation from *σίγμα* indeclinable. *σιγμός*, of course, would have given this form too, but did not. *σιγμός* indeed was itself used as a phonetic term (= 'sibilant') in the second century B.C. by Dionysius Thrax, and thenceforward.

It is noteworthy that these neuter letter-names in *-a* resisted analogical declension for so long. Democritus is strangely out of his time in declining them—Frag. 20: τὰ ὀνόματα τῶν στοιχείων ἄκλιτά εἰσιν . . . παρὰ Δημοκρίτῳ δὲ κλίνονται· λέγει γὰρ δέλτατος καὶ θήτατος (Schol. on Dion. Thrax, p. 184). But *δέλτατος* and *θήτατος* are *unica* which do not invalidate the norm. Democritus had peculiar notions respecting the alphabet: he affected the Ionian spelling *γέμμα* and used *μῶ* for *μῦ* (Frag. 19).

⁸ The Hebrew name; the Aramaic was *simkhā*.

having an entirely pure resonant nasalization—adds a cerebral or cacuminal *n*⁹, and carefully distinguishes between its six nasals graphically, having evolved most elaborate rules controlling their exact use and intermutation. Towards the other extreme of carelessness English has, apart from *m*, only one symbol *n*, and by the combination *ng* covers a somewhat illogical assortment of sounds (ɲ in *hanger*, ɲ-g in *hunger*, *n-g* in *un-girt* and *n-dj* in *ungerminated*). In *hanger* it is the English convention to represent by the symbol *ng*, and in *hunger* by the symbol *n*, a sound which is not *n*. This same sound it was the convention in Greek to represent by γ, although it was not *g* either. In neither language was it felt desirable or necessary to invent a new symbol for this sound which was neither *n* nor *g*. But some Greeks at least distinguished between γ = *g* and γ = ɲ: they called the former gamma, the latter agma. In Gothic we find the same convention as in Greek: *atwaggēljō* = εὐαγγέλιον; *tuggō*, *drigkan*, *siggan* correspond to ‘tongue,’ ‘drink,’ ‘sink.’¹⁰ When that great spelling reformer, the poet Accius, proposed writing *aggulus*, *agceps* for *angulus*, *anceps*, he was aware of the problem but was misled by the Greek model. Otherwise he might have employed a special letter for the special sound, as had been done long before his time in India by generations

⁹ A non-Indo-European sound usually said to have arisen in Sanskrit from contact with Dravidian neighbours (see, *e.g.*, Macdonell's *Sanskrit Grammar* and, for a recent statement of the view, Graff, *Language and Languages*, 1932, pp. 216, 361-2). But it is only right to add that the opposite theory of indigenous development had had its champions from time to time: Professor W. H. Ferrar, the late Fellow of this College, following Georg Bühler's “On the Origin of the Sanskrit Linguals,” devoted an Appendix in his unfinished *Comparative Grammar* to an exposition of arguments in favour of a native origin.

¹⁰ But in a few words *ggw* stands for *g-gw*, not *ng-gw* (Wright, § 151).

of subtle phoneticians.¹¹ But another point should be noted. King and Cookson say (*Compar. Grammar*, p. 58), what was sufficiently near the truth for their day and for practical purposes, “*n* is always assimilated to the character of the following consonant: *e.g.*, it is guttural in ἐγκαλίω, dental in ἐντέλλω, labial in ἐμποδών.” But just as the modified quality of the nasal in combination is here falsely written γ before κ, so the ν before τ and the μ before π represent sounds which are not quite the same as pure intervocalic *n* and *m*.¹² Modern phoneticians also speak of the *t* and *p* here as being different from *t* and *p* not in combination.¹³ But there should be reasonable limits set to subtlety.

¹¹ Śikshā (‘Phonetics’) was one of the six sciences included in the body of interpretation known as the Vedāṅga. “The ancient Indian grammarians had by the fifth century B.C. arrived at scientific results unequalled by any other nation of antiquity” (Macdonell).

¹² In any case Greek used ν and μ (and λ and ρ) for both breathed and voiced sounds. Probably τὸν ἵππον, ἀριθμός, φλοῖστος and χρόνος were *tonh ippon*, *aritmhos* (not *arit-h-mos*), *phloiszbos* (not *p-h-loiszbos*) and *krhonos* (not *k-h-ronos*), as pointed out by Edmonds, *Comp. Phil.*, pp. 48–9. The full significance of this is realised when we remember that *lh*, for instance, is not *l-h* but more close to *h-l* and is used conventionally to represent the Welsh *ll* (*i.e.*, breathed *l*). Similarly *nh* is not a truly aspirated *n* (= *n-h*)—nor, of course, like the Portuguese *nh*, a nasal palatal—but is a symbol for a breathed *n* which was heard in the pronunciation of the English *know* as *hnow* as late as the eighteenth century. Again, the initial λ, ν, μ, ρ of λήγω, νιφάς, etc., (which lengthened a preceding short final vowel in Homer) differed from the simple λ, ν, μ, ρ of λύω (Eng. *loose*), etc. λήγω was *hλήγω* for *σλήγω (Eng. *slack*), νιφάς was *hνιφάς* for *σνιφάς (Eng. *snow*).

¹³ Cf. Sapir, *Language*, p. 44, “probably not one English speaker out of a hundred has the remotest idea that the *t* of a word like *sting* is not at all the same sound as the *t* of *teem*, the latter *t* having a fullness of ‘breath-release’ that is inhibited in the former case by the preceding *s*.” And on p. 56 he speaks of the two *t*-sounds as “noticeably distinct.” I rather suspect that Sapir’s “one in a hundred speakers” should really be “one in ten thousand”! Similarly Sweet, *Primer of Phonetics*, § 94, points out differences at the other end of a plosive sound: in *put back your hat* there is no ‘recoil’ or final breath-glide after the first *t* as there is after the second *t*. The three ‘moments’ of a plosive—implosion, tension, explosion—are clearly described and discussed by Grammont, *Traité de Phonétique*, pp. 36–45: either or both implosion and explosion may be omitted, but not tension.

Agma, as a name, has suffered a most undeserved obscurity, especially as compared, say, with the renown of false sampi.¹⁴ It is a convenient *terminus technicus*, and should have commended itself to modern users for its brevity (in the place of 'nasalised guttural'), just as 'schwa' is so much easier to use and repeat than 'indeterminate vowel.' It does not occur in the *N.E.D.* (though Lindsay used it as English), in the grammars and works of Brugmann, Hirt, King and Cookson, Curtius, Wright, Giles, Edmonds, Meillet and Buck, in the Greek etymological dictionaries of Prellwitz and Boisacq, in recent books on the Greek language (*e.g.*, by Atkinson and Semenov), in the epigraphical works of Larfeld, Collitz, Dittenberger, Cauer and Hicks and Hill, in Isaac Taylor's *Alphabet* and articles on the alphabet in the Encyclopedias, or in (*e.g.*) Grammont's large *Traité de Phonétique* (1933).¹⁵ Even in Lindsay fate has been unkind to

¹⁴ Properly removed from L. & S.⁹ (though it occurs in as late a work as Buck's *Comp. Phil.*, 1933). Sampi is not older than the fourteenth or fifteenth century (Keil in *Hermes*, XXIX, p. 267, actually says "than the second half of the seventeenth century"), and even then was not applied to a letter but to a numeral. Sir Edward Maunde Thompson states the common view that the name of the numerical sign came "from *san* + *pi*, so called from its partial resemblance, in its late form, to the letter *pi*." But it may not have even that dignity of origin, if Jannaris (*Class. Quarterly*, I, 1, 1907) is right in suggesting that it may be merely $\omega] \sigma \ \& \nu \ \pi i$. The name of the letter may have been $\sigma \acute{\alpha} \nu$ originally, though $\sigma \acute{\alpha} \nu$ may also have been applied generally to sigma, as it certainly was by the Dorians (Hdt., I, 159). There was a confusion in Greek between the names and the respective serial positions of the borrowed Semitic sibilants. But the correct later (though still ancient) name for 'sampi' was παρακύσμα, which is acknowledged by L. & S.⁹ (p. 1562) in the article on Μ (eighteenth letter in the 'proto-Etruscan' abecedaria) but is curiously overlooked in its proper lexical position in the dictionary. See also F. W. G. Foat in "Sematography of Greek Papyri" (*J.H.S.*, XXII, 1902, pp. 144-5) and in "Tsade and Sampi" (*ibid.*, XXV, 1905, pp. 339 and 364) on the name Sampi.

¹⁵ I regret that I cannot consult Roberts' *Greek Epigraphy* or the books of S. Reinach and Kirchhoff, Jannaris' *Historical Greek Grammar*, Larfeld's summary of the state of Greek alphabetology or recent

agma. It still appears in the Index to the small issue of his *Latin Language* (the *Short Historical Grammar*, 2nd ed., 1915, the book more likely to be in the hands of the student) but has disappeared, as a name, from the text! And not only so but the reference in the Index is to the wrong page of the text. Accius' proposed *aggulus* really appears on p. 8. Although my primary intention was to correct the false etymology (or at least false association) given in L. & S.⁹ to the alphabetic ἄγμα, I hope that I have also succeeded in restoring Agma not merely to life but to its rightful place in the Greek alphabet. It had a sort of shadowy home at the end of the Ionic alphabet of twenty-four letters, existing there as a name but not as a symbol.¹⁶ Should it be asked why agma, then, does not appear in any Greek abecedaria, the answer is that it does—as γ. The sign γ was both gamma and agma, just as the single symbol c with us has two values, k and s. Ion not merely describes the convention of writing γ, viz., agma, for the sound γ, but actually speaks of agma as "the twenty-fifth letter of the alphabet." Part of the passage is quoted by Lindsay, *Latin Language*,

works on the alphabet such as that of Clodd or Direnger's *L'Alfabeto nella storia della civiltà* (Florence, 1937), and many of the articles noticed by M. N. Tod in his biennial account of the progress of Greek Epigraphy (in *J.H.S.*).

¹⁶ I am reminded of a curious and amusing parallel of sorts hailing from Ireland. Not so many years ago, when one passed by the open windows of a National School in the country one used to hear the alphabet being chanted within, and it invariably ended in a mysterious way, viz., "x y z and." Enquiry brought to light the fact that this was a slurred pronunciation of "x y z and," and that this strange ending owed its existence to the fact that the National Board had issued a large poster of the alphabet for class recitation to which ampersand had been added at the end to make three lines of equal length! Thus,

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	&

§ 10¹⁷: here is the whole of the relevant citation from Priscian (*Inst. Gram.*, I, 39—Keil's *Grammatici Latini*, II, p. 30):—

sequente g vel c, pro ea [sc. litera n] g scribunt Graeci et quidam tamen vetustissimi auctores Romanorum euphoniae causa bene hoc facientes, ut 'Agchises,' 'agceps,' 'aggulus,' 'aggens,' quod ostendit Varro in primo de origine linguae Latinae his verbis; "ut Ion scribit, quinta vicesima est litera, quam vocant agma, cuius forma nulla est et vox communis est Graecis et Latinis, ut his verbis: 'aggulus,' 'aggens,' 'agguilla,' 'iggerunt.' in eiusmodi Graeci et Accius noster bina g scribunt, alii n et g, quod in hoc veritatem videre facile non est. similiter 'agceps,' 'agcora.'"

This is the only place where agma is named, though the sound is described elsewhere. I had been reluctant to identify Varro's Ion offhand with Ion of Chios (although the Chian is the only Ion of literary history) on account of the latter's early date and because I was misled by an omission in L. and S.⁹ In the Prosopographia of the new edition Ion of Chios is described as *elegiacus*, *historicus*, *lyricus*, and *tragicus*. Agma would be mentioned only in a prose work and a history does not seem a likely *milieu* for discussion of phonetics. I am therefore deeply grateful to Professor Rudolf Pfeiffer of Oxford for drawing my attention to the fact that Ion of Chios also ranks as a philosopher and that

¹⁷ Lindsay is perhaps unjustifiably tendentious in speaking *passim* of "the Agma," seeing that one does not normally refer to "the alpha," "the beta," etc. But the definite article is only a measure of rarity or unfamiliarity, just as the schoolboy beginning to read Homer meets with "the digamma." Later he may come to more familiar terms with 'digamma.'

Wilamowitz-Moellendorff, recording this citation-at-second-remove of Ion of Chios in No. ccxix of his *Lesefrüchte* (*Hermes*, lxii, 1927, p. 279, footnote 2), is responsible for its inclusion, as Fragment 3a, in the latest edition (fifth, 1934) of Diels' *Vorsokratiker*. My qualm as to the accuracy of the tradition is also felt by Wilamowitz: but he adds "eine solche Spekulation [ist] in der Zeit des Protagoras wohl denkbar, und über die Buchstaben nachzudenken lag dem Ionier in Athen nicht fern."¹⁸ The attribution to Ion of Chios, however, had been made long before by Schneidewin (*Mus. Phil.*, viii, p. 463 sq.).

It is not easy to determine where Ion's remark ends and Varro resumes. The statement '25th letter' is obviously Ion's and there can be little doubt that the name *agma* is also from Ion: but whether *cuius forma nulla est* is an aside of Varro or a continuation of the original passage of Ion is not so clear.^{18a} It is to be noted that Ion is not named as the originator of the nomenclature: Ion spoke of *agma* as a current term.

Marius Victorinus (*Art. Gram.* i, 4, 53—Keil's *Gram. Lat.* vi, p. 16), in correcting the common view that a sound intermediate between *m* and *n* existed in *unquam*, *quamquam*, etc., says that in such words there is rather a sound intermediate between *n* and *g*, and proceeds:

¹⁸ Callimachus, rebutting those critics who charged him with experimenting with too many kinds of metre and of *genre* of composition instead of becoming an outstanding master of one, cited against them the versatility of Ion of Chios and his preëminence in so many branches of literature at once (from a recollection of Professor Pfeiffer's paper on Callimachus read at the Classical Association, 1941). It is curious that L. & S. omits mention of Ion as *philosophus*, especially as it records his *Τριαγμός* ("a philos. work," *sub voce*). There is no indication of the source of Fragment 3a: but it looks as if Ion was also *grammaticus*.

^{18a} It was an unknown commentator in cod. Darmstadiensis 204, followed by Ritschl, who first pointed out that Varro's words extended as far as '*agcora*.'

nam et Graeci, cum scribunt ἄγγελος ἄγγος ὄγκος et similia, si syllabam an sequatur syllaba quae initium habet a g aut a c, convertunt n litteram in g et pro n g scribunt, ut ἄγγελος ἄγκυρα ἄγκιστρα, cum inter n et g medium sonet vocis productae, non ut aliis videtur, inter m et n.

Three pages later (i, 4, 70; Keil, p. 19) Victorinus continues

‘anceps,’ ‘ancilla,’ ‘Angitia,’ ‘angustum,’ ‘anquirit,’ ‘ancora’ iam dixi Attium non per an, sed more Graecorum per ag solitum scribere,¹⁹

and again describes the intermediate sound of agma. The use of such an expression as ‘ag’ to connote the first syllable of these words illustrates the natural tendency to name the symbol therefor ἄγ-μα. The last *testimonium* which must be quoted here is a fragment of the *Commentarii Grammatici* of P. Nigidius Figulus²⁰ cited by Aulus Gellius, *Noct. Att.*, xix, 14, 7, as an example of Nigidius’ style. It reads:—

inter literam n et g est alia vis, ut in nomine ‘anguis’ et ‘angari’ et ‘ancorae’ et ‘increpat’ et ‘incurrit’ et ‘ingenuus.’ in omnibus his non verum n, sed adulterinum ponitur. nam n non esse, lingua indicio est; nam si ea litera esset, lingua palatum tangeret.

¹⁹ *iam dixi Attium* is Ritschl’s correction of a *lectio corrupta*, but the general sense is not in doubt.

²⁰ An injustice has also been done to Nigidius by fate. Most elementary handbooks on Latin Literature speak of M. Terentius Varro as “the most learned of the Romans.” In reality Nigidius shared the title—*M. Varronem et P. Nigidium, aetatis suae doctissimos Romanos* (GELLIUS).

Agma is not named here, but its sound and formation are described with an accuracy which would do credit to a modern phonetician.

Such is the story of forgotten agma.²¹ Incidentally it appears that the entry 'II = κλέμμα' in L. & S.⁹ is also to be regarded with suspicion. It is hard to see how ἄγμα from ἄγνυμι would acquire the sense 'theft.' Voss was surely right in conjecturing κλάμμα (from κλᾱν) in Hesychius here. Suidas indeed glosses ἄγμα by κλάσμα.

A minor problem arises. Can -γγ- occur in Greek as genuine double gamma? Only once in Homer (*Il.* xx, v. 458) does κατά suffer apocope before a word beginning with γ (καὶ γόνυ). Such forms as κάββαλε, κάππεσε convincingly suggest that καὶ γόνυ represents a true double plosive without any nasalisation. This is Leaf's view (*ad loc.*), which he supports by quoting the variant κακ γόνυ of some good MSS. (*cf.* the almost parallel κακ κεφαλήν, *ibid.*, v. 475). Many MSS., how-

²¹ Apart from Lindsay's use of the word, agma seems to occur only in Wilamowitz' footnote establishing the new fragment of Ion (and in Diels⁵ and in texts of Varro and Priscian).

Mr. Gordon Quin has kindly sent me the following communication on the sound and symbol: "I know of no language except Sanskrit which has a special and distinct symbol for *ra*. The reason is probably that it occurred only in conjunction with other consonants in Indo-European languages. The absence of such a *symbol* in the Greek alphabet would account for the rarity of ἄγμα. It is interesting that in Modern English and other Germanic languages *ra* can occur between vowels and at the end of a word. In Irish and Welsh it quite frequently appears at the *beginning* of the word. It is noted *ng* in all Celtic languages, and is called *ngetal*, *gniatal*, *ngútal* ('a reed or rush') by the native Irish Grammarians." To this I can only add that initial *ng* also seems a characteristic feature of the phonology of the vast Bantu and Negro-African families (as one may deduce from the atlas—Lake Ngami, Ngaundere, Ngara in localities as far apart as Bechuanaland, the Cameroons, Nyasaland). But note a separate sign for agma in the Oghams. Have we by any chance a clue in 'agma' to the mysterious word *ogam* ("Ogham-writing was invented by Ogma"—Tract on Ogham in *The Book of Ballymote*), just as their alternative name *Beithluisnin* came from *beith* and *luis*, the names of *b* and *l*? See Macalister, *Secret Languages of Ireland*, pp. 15–30, for their Greek origins: and Bishop Graves in *Hermathena* IV, esp. p. 457.

ever, and early edd. here read *καγγόυυ* in one word, which is, I believe, misleading. L. & S.⁹ in its list (p. 883 *sub finem*) of apocopated forms of *κατά* is rather at fault in not distinguishing the rarity of *κάγ* as compared with the others. There is one other literary instance of *κάγ*—in Sappho, 44, *κὰγ γόνων*,²² but this is a very doubtful reading (obelised, Lobel, p. 46). The natural concurrence of *γ* + *γ* is extremely rare in Greek, as no compounding prepositions can end in *-γ* or in an assimilable *-δ* or *-β*.²³ In Latin, however, *ad* and *ob* gave (e.g.) *aggero* and *oggero*. Here was indeed a pretty problem for the reforming Accius. He had accepted the new Ennian orthography of double consonants (with zest, one imagines, for here surely lay the inspiration for his own proposal to write double vowels also); but in the case of the fairly frequent double *g* the archaic spelling with the single letter would have to be retained by him. Lindsay thus accounts for the curious persistence with which the MSS. offer the highly ambiguous *ager* for *agger* in citations of Lucilius (408 ; 633, Marx).²⁴

²² Whether to accent these forms is another *dubium* (Leaf reads *καγ*, *κακ*, *καδ*, etc., L. & S. has *κάγ*).

²³ As *κ* + *γ* always gives *κγ* in literary texts, e.g. *ἐκγίγνομαι*, there is much to be said for the MS. variant *κακ γόνυ* in the *Iliad*, l.c. In inscriptions, however, such forms as *ἐγγράφω*, i.g. *ἐκ-γράφω*, are frequent. As *ἐκ* may become *ἐγ* in inscriptions before the other voiced sounds *β δ λ μ* and *ν* also, where literary texts have *ἐκ*, the presumption is that the first *γ* in *ἐγγράφω* marks only the voicing of the plosive by assimilation and not the intrusion of an alien nasalisation. Is it too much to suppose that *ἐγγράφω* with gamma (= *ἐκ-γράφω*) was thus distinguished in pronunciation from *ἐγγράφω* with agma (= *ἐν-γράφω*)?

²⁴ If this account of Agma be accepted, then L. & S. should not merely separate *ἄγμα* the sound or letter from *ἄγμα*, -τος (*ἄγνυμι*) but it should mark it as "probably indeclinable." Possibly also, on the analogy of *σίγμα*-*σίγμα*, *στίγμα*-*στίγμα* and other letters, a variant *ἄγμα* should be posited (this was the accentuation of *ἄγμα* I in L. & S.⁹).

A practical corollary to this paper is that those modern purists who, disclaiming the tradition through Latin, follow Browning and set Aischulos and Thonkudides before our troubled eyes, should put their vaunted consistency beyond reproach by writing *Anagke*, *Agechises*, *Paggaiou* and *Iūgx*. *Ananke* is Latin (at least, in part), *pace* Accius!

DOUBLE GAMMA AS TRUE 'DOUBLE-G' IN GREEK

A PROBLEM IN PHONETIC REPRESENTATION

By L. J. D. RICHARDSON

READERS of Greek are so used to pronouncing $\gamma\gamma$, in print or writing, as $-ng-g-$ that the question is seldom, if ever, asked whether $\gamma\gamma$ may in some cases simply represent a plain double gamma.¹ The possibility of such a convention as $\gamma\gamma = -ng-g-$, i.e. $\text{agma}^2 + \text{gamma}$, being overridden in special circumstances is suggested by the parallel that in Gothic, which borrowed from Greek this method of writing the nasal guttural before another guttural,³ the combination ggw , which normally represents $ng-gw$, as in *siggwan* (cf. the English cognate 'sing'), can on occasion stand for $gg-w$, as in *bliggwan* (cf. the cognate 'blow' = stroke). Did any peculiar conditions ever occur in Greek to demand the pronunciation $-gg-$ for $\gamma\gamma$? This paper is the story of a quest. We shall find that several types have been sporadically noticed in unrelated and largely inaccessible quarters, and some not noticed at all: no attempt has been made at integration, to

¹ Throughout this paper discussion of the convention $\gamma\gamma = ng-g$ includes the similar use of $\gamma\kappa$ for $ng-k$, $\gamma\chi$ for $ng-kh$ and $\gamma\xi$ for $ng-ks$.

² For a recent discussion of *agma* see L. J. D. Richardson, *Agma, A Forgotten Greek Letter*, in *Hermathena*, LVIII, and J. W. Pirie's notice in *C.R.*, LVI, 2, p. 92. The name *Agma* for α derives from a single passage in Priscian (I. 39). Against Pirie's view that *agma* is not an onomatopoeitically created letter-name (as suggested by me), but simply the existing noun $\acute{\alpha}\gamma\mu\alpha$ ('fragment', from $\acute{\alpha}\gamma\gamma\upsilon\mu\iota$) conveniently pressed into service from its resemblance to $\gamma\acute{\alpha}\mu\mu\alpha$ may be cited the fact that no other alphabetic name was derived in this way. $\sigma\acute{\iota}\gamma\mu\alpha$ is no exception, as is shown by its being indeclinable and by its alternative accentuation $\sigma\acute{\iota}\gamma\mu\alpha$ (i.e. it is not a noun $\ast\sigma\acute{\iota}\gamma\mu\alpha$, $-\tau\omicron\varsigma$, from $\sigma\acute{\iota}\zeta\omega$). Those scholars, e.g. ten Brink, Wilmanns, who emended to $\acute{\alpha}\gamma\gamma\mu\alpha$ in Priscian, must have had a phonetic origin in mind.

³ This orthography also appears in the Runes, which indeed had a special letter (*ing*) for $ng-g$. But the symbol for *ing* has obviously evolved from a ligature of two symbols for *gifu* (= *g*).

consider the question as a whole, and some of the forms, even when recognized, have been left unexplained.

In the first place, it is obvious that the controlling conditions must be very unusual, for *-gg-*, never being original, can ordinarily arise only from contraction or compounding, and, as no Greek word ends in *-γ*, or in a *-β* or *-δ* which would be assimilated to *-γ-* before *γ-*, there can be nothing in Greek comparable with the Latin *aggredior* or *suggero* from *ad* and *sub* respectively. There will be found two ways in which *-gg-* can arise in composition, one in literary texts, the other a vernacular pronunciation where we must look to epigraphy and papyrology for evidence.

1. *Literary Texts*.—In poetry, especially in Homer, *κατά* (and *κατα-*) may suffer apocope, with assimilation of the final *τ*, before a consonant. Thus *καὶ δώματα, καὶ πεδίων* and *κάββαλε* for *κατὰ δώματα, κατὰ πεδίων* and *κατάβαλε* (or *κατέβαλε*). I can find only one instance¹ in the whole corpus of Greek poetry of *κατά* thus treated before a word beginning with *γ*. This is at *Iliad* XX, 458, where editors read *καὶ γόνυ*² or *καγγόνυ* according to choice. Habit here will make the casual reader pronounce the combination as *kangonu*: this is certainly wrong. Leaf alone among the editors (to my knowledge) notes this,³ and cites as confirmation the variant *καὶ γόνυ* of some good MSS. Cf. the *καὶ κεφαλὴν* which occurs a few lines later (v. 475), and, generally, in addition to the *κκ*, *δδ*, *ππ* and *ββ* already illustrated, *καὶ ῥόον, καμμονίη, κάλλιπε*.⁴ The gemination

¹ Other than the very doubtful *καὶ γόνων*, Sappho 44 (Bergk, *bis*), obelized by Lobel.

² Nauck and Leaf in his 2nd ed. print *καγ γόνυ*. For all the MS. variations (which include several strange *voces nihili*), see the exhaustive *apparatus criticus* in T. W. Allen's edition of the *Iliad* (1931).

³ The pronunciation of *καὶ γόνυ* is not discussed by Brugmann² (1900) or Schwyzler (1934), but Kühner-Blass³ (1890), p. 57, recognizes its true sound, as does Schwyzler (1939).

⁴ The only Homeric forms which do not exactly correspond with this model are *κάτθανε*, *καὶ φάλαρα, κάκτανε, κάσχεθε* and *καστορνῶσα*. But the first two are regular accommodations, as the reduplication of verbs with an initial aspirate shows, while *κάσχεθε* (*Il.*, XI, 702) and *καστορνῶσα*

in all these combinations is due to complete assimilation and there is no reason for a nasal to intrude anomalously into one of the forms. *κὰγ γόνυ* is to be sounded *kaggonu*.

It is therefore misleading of Liddell and Scott,⁹ p. 883, F, and of Lobel, *Sappho*, p. xlvii, in view of the uniqueness¹ of this *κὰγ*, to list it without comment with the other frequently occurring types of apocopated *κατά*.

Gamma Geminatum also appears in a modern emendation. In the vexed line 699 of Aeschylus' *Choephoroe* Wilamowitz-Moellendorff in his *editio maior* reads *ἐγγράφεις*. His critical note is '*ἐγγράφει correxi; est ἐκγράφεις*'. He is therefore taking *ἐγγράφεις* as a compound of *ἐκ*, not of *ἐν*; and a nasal sound would have no *raison d'être* in this collocation. But Wilamowitz does not comment on the pronunciation of his word. I owe this reference to Professor W. B. Stanford.

2. *Attic Inscriptions and Papyri*.—One does not turn to epigraphy to look for consistency in spelling. For instance, in Attic inscriptions as in those of other dialects, it is common to find *ν* written as if unassimilated before consonants, and this not only under the influence of the derivation, e.g. *συνμάχων*², *ἐγγραφοι*³, but also in other cases where the etymology is not so clear, e.g. *ἐνγύς*,⁴ or even where the etymology is obscured by this spelling, e.g. *ἐγρανμάτευν*.⁵ Thus the phonetic sequence *n + g*, which rapidly becomes

(*Od.*, XVII, 32) stand for, and should, perhaps, be written, *κάσσεθε* and *καστορνύσα*. Cf. *κασπολέω*, *Sappho*, 81 (= *καταστελῶ*), but contrast the different type of reduction in *κάσμορος* (Hesychius) and kindred forms in dialectical inscriptions. Possibly we should write *κάκκτανε* also.

¹ Just as *Il.*, XX, 458, gives the only instance of apocope resulting in *γ* = *g* usually misread as *ng*, so the only instance I can find in Homer of a correction resulting in the opposite *dubium*, viz. *ν* = *ng* and so better written *γ*, is provided by *ἀνξηράνη* in *Il.*, XXI, 347 (from *ἀνα-ξηράνω*), where some editors read *ἀγξηράνη*. The Dictt. are in two minds about these conjunctions, e.g. L. and S.⁹, Grimm-Thayer *παλιγγενεσία*, Souter *παλιγγενεσία*.

² *C.I.A.*, II, 249, 10.

³ *C.I.A.*, I, 446, 34.

⁴ *C.I.A.*, I, 465, 2.

⁵ *C.I.A.*, II add., 489, b, 3.

$n + g$ in usage, is represented, whether in the body of a root (*ἄγγελος*), in composition (*ἐγγενής*) or between words (*τὸν γραμματέα*), indifferently by $\gamma\gamma$ or $\nu\gamma$. There is no presumption that *ἄγγελος* was pronounced in any way other than was *ἄγγελος*. This apparent interchangeability of $\gamma\gamma$ and $\nu\gamma$ in writing, together with so many other vagaries of orthography, makes it possible to suggest that an occasional spelling $-\nu\gamma-$ for $-\gamma\gamma-$ in a very exceptional word, in which there may be some reason to believe that $-\gamma\gamma-$ represented a true double g , would not be an altogether insurmountable objection to that belief. Appeal will be made later to this 'licence'.

In literary texts $\kappa + \gamma$ always, with the one exception of *ἑγγονος* 'grandchild' (for which see p. 161), gives $-\kappa\gamma-$, e.g. *ἐκγίγνομαι*.¹ But in Attic inscriptions the preposition *ἐκ* regularly becomes *ἐγ-* in composition before $\gamma-$, just as it does before the other voiced sounds $\beta \delta \lambda \mu$ and ν .² The papyri, however, while usually showing *ἐγ-* before $\beta \delta \lambda \mu$ and ν , keep the form *ἐκ-* before $\gamma-$, except in the word *ἑγγονος* 'descendant', 'issue' = literary Attic *ἑκγονος*.³ There are four problems here—the pronunciation of *ἐκγίγνομαι* and its epigraphical equivalent *ἐγγίγνομαι*: the anomalous reversion to *ἐκγίγνομαι* in the papyri: the exception *ἑγγονος* (*ἑκγονος* in texts: and the exception *ἑγγονος* = *ἑκγονος* in the papyri. Of these, the first can hardly be called a problem now: the last three, however, have indeed been noticed descriptively as facts; but I know of no explanation having been put forward.

It is clear that *ἐκγίγνομαι* and *ἐγγίγνομαι* represent the same sound, the textual form being the more conservative.⁴

¹ So also $\kappa + \chi = \kappa\chi$ (e.g. *ἐκχέω*) and $\kappa + \xi = \kappa\xi$ (e.g. *ἐκξέω*).

² Meisterhans, *Grammatik der Attischen Inschriften*, pp. 106–8.

³ Mayser, *Grammatik der griechischen Papyri aus den Ptolemäerzeit*, pp. 225–8.

⁴ Cf. Brugmann (*G.G.*, § 140d), 'das *ἐκ* auch vor die stimmhaften Konsonanten zu stehen kam, z.B. att. *ἐκ βουλῆς*, *ἐκδοσις*, war jedenfalls mehr Schriftgebrauch als Usus der Sprache selbst.'

The -γγ- thus stands for -gg- or for shades of approximation to -gg- ranging from -kg-. This is confirmed by the behaviour of ἐκ before the voiced sounds other than γ-. As the inscriptional forms ἐγ βουλῆς,¹ ἐγ Δήλου,² ἐγλέγειν,³ ἐγ Μακεδονίας⁴ and ἐγ νεωρίων⁵ are normally represented in texts by ἐκ βουλῆς, ἐκ Δήλου, ἐκλέγειν, ἐκ Μακεδονίας and ἐκ νεωρίων, the presumption is that the first γ in ἐγ γαμετῆς⁶ also marks merely the voicing of the plosive κ by assimilation⁷ with the following γ and not the intrusion of an alien nasalization.⁸

The writing of ἐγ for ἐκ before γ occurs also in inscriptions outside Attica. For example, in Dittenberger's *Sylloge Inscriptionum Graecarum*², 177, 62,⁹ ἐγγράψασθαι (= ἐκγράψασθαι) appears in an inscription from Teos. W. Feldmann would emend to ἐκγράψασθαι, but Dittenberger remarks 'sed non est cur emendemus, dummodo hic prius γ non nasalem, sed mediam assimilatione ortam interpretemur, proinde ac modo ἔκγονοι modo ἔγγονοι in titulis legitur'. A true geminate gamma has thus been recognized

¹ *C.I.A.*, IV, 2, 834, b, 68.

² *C.I.A.*, II, 814, a, A, 29.

³ *C.I.A.*, II, 589, 27.

⁴ *C.I.A.*, IV, 1, b, 35, c, p. 65, l. 15.

⁵ *C.I.A.*, II add., 834, c, 12.

⁶ *C.I.A.*, IV, 2, 841, b, 110-11.

⁷ But in many traditional phrases and combinations the assimilation was probably not direct but due to the voicing of the original sigmatic form ἐξ. ἐξ Διός, i.e. *eks dios*, gave *ekz dios*, which in turn gave *egz dios*, and finally *eg dios* (Brugmann, op. cit., § 113, 140d). This will explain the form ἔσγονος (for ἐγζ-γονος, from ἐξ + γονος) found in Boeotian, Cretan, Thessalian and occasionally in other dialects, where a different way of reducing the cluster *gzg* was followed.

⁸ I note no tendency in one's own speech to nasalize just because two voiced gutturals chance to come together: *big goose* does not drift towards *bing goose* (but see footnote 2 on page 166 on the 'irrational nasal').

⁹ = *S.I.G.*³, 344. For this reference to the third edition (not accessible to me) and much other help on epigraphical points I am greatly indebted to Professor J. M. R. Cormack. He has given me καὶ γὰρ καὶ θαλατταν in *S.I.G.*³, 179.9 (Boeotia), but adds that it is very dubious, as 'the majuscules read ΚΑΠΠΑΕ'.

by epigraphists.¹ Furthermore, we must conclude that ἐγγράφω, with gemination of gamma (= ἐκ-γράφω) was distinguished in pronunciation from its homograph ἐγγράφω, with agma (= ἐν-γράφω).²

In inscriptions, however, this ambiguity was often (? conveniently) avoided by the chance of the habit, as already mentioned, of writing ἐνγράφω for the latter. I believe that the same principle, avoidance of ambiguity, was *deliberately and consistently* followed in the papyri. But here the method employed was to retain the form ἐκ before γ alone of the voiced sounds. Hence ἐκίγνομαι (pronounced *egg-*), but ἐγβάλλω, ἐγλείπω, etc.

The twofold and doubly anomalous ἔγγονος, however, merits some attention. Why should this form appear in the papyri, contrary to the practice in other words? ³ I believe that this spelling is due to the influence of an established orthography which obtained in earlier Attic Greek, an orthography which reflected a peculiar pronunciation that went with a special meaning. The dictionaries give ἔκγονος 'child', 'descendant': this is the normal form and the general meaning. But (e.g.) Liddell and Scott ⁴ also lists, as a separate but related word, the form ἔγγονος, with the key 'properly *grandson*'. It then cites instances of ἔγγονος used for ἔκγονος, as 'simply *descendant*', but notes that in the passages cited the MSS. vary between the two forms (as may well be

¹ So also Mayser, *op. cit.*, p. 228, 'ἔγγονος (sprich eggonos, nicht engonos)'; and Kühner-Blass, pp. 57, 178 ('mit *gg*, nicht *ng*'): Schwyzler, p. 179, footnote 10 ('noch seltener als *bb* und *dd* ist *gg*, geschrieben *γγ* oder *κγ*'): W. H. D. Rouse, *C.R.*, XVIII, 5, p. 277 ('the latter being *eggonos*'). But when Hicks and Hill, *Greek Historical Inscriptions*², p. 313, dismiss the frequent occurrence of ἔγγονος for ἔκγονος as 'a mere misuse of one word for another', they fail to see the problem. It is obvious that they posit two words, ἔκγονος and ἔγγονος, automatically sounding the latter as *eng-gonos* and assuming the derivation ἐν + γονος.

² But such is the anarchy in epigraphical forms that ἐκγράφω is found standing for ἐν-γράφω in *S.I.G.*³, 742, 29, Ephesos I⁴ (see Schwyzler, I, p. 317).

³ Ἐκγονος is very occasionally found, e.g. in Pap. Tebtunis, I, 79, 85 (c. 148^a).

expected). Liddell and Scott, however, offer no suggestion as to the pronunciation of ἔγγονος (which a casual reader would certainly sound as *engonos*). It is true that at the end of the article Liddell and Scott state 'ἔγγονος may represent ἔκγονος (q.v.), both forms are found in Attic Inscriptions up to *circa* 300 B.C. '; but I think this is a note on the derivation, not on the sound, of the word. There can scarcely be any doubt about the derivation: Liddell and Scott is correct, the word is a compound formed from ἐκ, not from ἐν—surprising though this be. For by all the laws of Greek orthography, ἔγγονος should represent ἐν-γονος and be pronounced *engonos*. But the sense is against this, and ἔκγονος and ἔγγονος are almost certainly doublets. I hazard an explanation of this puzzle, as follows. The original compound, undoubtedly, was ἔκγονος (cf. 'off-spring'), with the general sense of 'progeny', and this sense remained with ἔκγονος. But the word came to be applied in particular to the young progeny in the household, especially the grandchildren.¹ It became a nursery word, with an 'advanced' or 'easy' pronunciation of *-kg-* as *-gg-*. It was also, no doubt, used hypocoristically. Now doubled consonants are a feature of the pronunciation of *Kosenamen*, as is shown in, e.g. *μικκός*, *τίτθη*, *πάππα* and many proper names,² and though the doubling here is not *ab initio* but mainly due to the easement, in familiar speech, of a consonantal cluster, it was, however, agreeable to the use of the word and possibly at first served the practical purpose of distinguishing between the two meanings of what was once the same word. However that may be, there is little doubt that in ἔγγονος, pronounced *eggonos*, we have a genuine example of double-*g* written γγ in a Classical Attic word.

The pronunciation *eggonos*, in this very intimate use of the word, was only an anticipation of what ultimately happened

¹ The grandchildren had a very special place at Athens, particularly in relation to their grandparents, from whom they were named.

² Cf. Brugmann, *G.G.*², § 120 note; Buck, *Comp. Greek and Latin Grammar*, § 209a; Buck, *Greek Dialects*¹, p. 71; etc.

to ἔκγονος ('descendant') and all similar words. The speed and degree of assimilation would depend on the familiarity of the compound: one can assume that in a ἀπαξ λεγόμενον or unusual coinage, or in a word in which the force of the prefix was specially marked, the tendency would be to retain longer than elsewhere a clearer enunciation of the prefix ἐκ- as *ek-*. Thus in English we make use of an abnormal change of stress accent to emphasize, by clarity of utterance and phonetic detachment, a prefix which is ordinarily unstressed, e.g. the occasional use (in colloquial or 'incorrect' speech) of 'ré-form', instead of the normal 'réform', to signify 'to form again', or the sentence 'I said "óbstruct", not "cónstruct"' (the normal *obstrúct* and *constrúct*).¹ This ability to hold, or to recover part of, the original etymology throws some light on the Attic doublets ἔκγονος and ἑγγονος. As compared with ἑγγονος 'grandchild', the word ἔκγονος retains to a varying degree some mental association with ἐκ—just as its English counterpart 'offspring' excites in a greater or less degree, in proportion as it consciously echoes 'off', the notion of origination attached to that particle. But the awareness of ἐκ will become very slight indeed with repeated use and with the ever closer degree of assimilation which follows wider currency. The spelling ἑγγονος (for 'descendant') in the papyri represents accurately what came to be the common phonology of all ἐκγ- words, but the double-*g* it was possible in this word alone to render thus by a purely phonetic orthography because the spelling ἑγγονος (for 'grandchild') was already long-established and familiar as the traditional representation of the sounds in the phoneme *eggonos*.

The numeral ἑξ was treated rather like ἐκ in inscriptions and papyri. While ἑξ and ἔκ appear indiscriminately before a breathed consonant, e.g. ἑξ ποδῶν by the side of ἔκ ποδῶν,

¹ This principle operates within limits. No degree of emotional emphasis will restore the original *ky* for normal *gg* in such a word as *blackguard*: this is because the phoneme *black* has ceased in this compound to carry any relevant meaning, cf. *cupboard* which is now crystallized with -*bb*.

before a voiced sound the forms $\acute{\epsilon}\zeta$ and $\acute{\epsilon}\gamma$ occur, e.g. $\acute{\epsilon}\zeta\delta\acute{\alpha}\kappa\tau\upsilon\lambda\omicron\varsigma$ and $\acute{\epsilon}\gamma\delta\acute{\alpha}\kappa\tau\upsilon\lambda\omicron\varsigma$. The last is found in *C.I.A.*, II, 834, b, II, 11, with the anomalous spelling $\acute{\epsilon}\gamma\gamma\delta\acute{\alpha}\kappa\tau\upsilon\lambda\omicron\varsigma$. A nasalized guttural cannot be intended here. Rather we are now introduced to $\gamma\gamma$ as a writer's variant for γ , the result either of a personal fondness for gemination or of an error due to graphical contamination with other forms. Double gamma occurs sporadically elsewhere in this way. For instance, in an inscription from Isaura (Galatia) given in *Inscriptiones Graecae ad res Latinas pertinentes*, Vol. III, No. 285, we find the phrase $\text{Ἀσκληπιῶ καὶ θεᾷ Ὑγγίᾳ}$. Ὑγγίᾳ must take its place with the not infrequent $\sigma\acute{\eta}\lambda\lambda\eta\nu$, $\gamma\acute{\epsilon}\gamma\rho\alpha\phi\phi\epsilon\nu$, $\Sigma\epsilon\beta\beta\alpha\sigma\tau\acute{o}\varsigma$, etc., and is significant for our inquiry only in so far as it shows that $\gamma\gamma$ did not inevitably and exclusively stand for *ng-g* for this inscriber.¹ In the papyri, too, we have, e.g., $\acute{\epsilon}\gamma\gamma\lambda\omicron\gamma\acute{\iota}\zeta\epsilon\tau\alpha\iota$ in *Pap. Lond.* I, p. 39, 41.

But $\gamma\gamma$, appearing as a variant for γ , is not always attributable to error or idiosyncrasy. In Ἀγγνούσιος ,² by the side of Ἀγνούσιος (demesman of Ἀγνοῦς), Brugmann finds³ an attempt to indicate the sound *wn*, a recognizable stage in the phonetic drift from $\gamma\acute{\iota}\gamma\nu\omicron\mu\alpha\iota$ to $\gamma\acute{\iota}\nu\omicron\mu\alpha\iota$ (but see *infra*, p. 173). Again, with this compare such spellings in the papyri as $\pi\rho\acute{o}\sigma\tau\alpha\gamma\gamma\mu\alpha$ (*Pap. Leid.*, 'Dream of King Nektonabos,' 3, 5, Wilcken).

3. *Non-Attic Inscriptions*.—Nothing very certain can be deduced from the welter of divergent forms in the inscriptions other than Attic. But one probable treatment of *gg* occurs

¹ A similar 'pointer' may be sought in the later use (borrowed from the Romans) of doubling final letters as an abbreviation to represent plurality. I cannot find a doubled gamma, simply; but in the case of the three co-emperors we have ΑΥΓΓΓ (= AUGGG), *Athenische Mitteilungen*, xxiv, 210 (listed by M. Avi-Yonah, *Abbreviations in Greek Inscriptions* = Supplement to Vol. IX of the *Quarterly of the Department of Antiquities in Palestine*, 1940). This convention still allows us to write edd. for 'editors' and pp. for 'pages'. But we should not use '22' to indicate 'a number of 2's', for 22 already has an accepted and exclusive significance of its own.

² *C.I.A.*, II, 1698, 3.

³ *Indogermanische Forschungen*, V, 380.

in Cretan. The Attic *πρέσβυς* (= *pres-g*u-s*) and related words appear with delabialization in some dialects, e.g. Boeotian *πρεσγέιες* (plural). In Cretan, too, the original form seems to have been **πρεσγυς*, which by the phonetic sequence *sg > zg > gg* should give **πρεγγυς*. The spelling usually found, however, is *πρεῖγυς*, cf. *πρειγευτάς*, *πρεῖγων*, *πρεῖγιστος* (= Coan *πρήγιστος*). Schwyzler¹ thinks that 'pregg- probably gave preig-'. But late Cretan inscriptions offer the form *πρεγγευτάς*. Buck² calls this a hybrid form—without expressing an opinion as to its pronunciation. One thing seems certain, that it does not stand for *preng-*. It is probably a representation of *gg* by *γγ*. In the variant *πρειγευτάς* Buck finds, as does Boisacq³, a secondary base *πρεισ-*, cf. Thessalian *πρεισβεία*, a form adverse to the compensatory lengthening required by Schwyzler.³ It seems likely, then, that Cretan had two original forms, **πρεσγυς* and **πρεισγυς*. This must be Brugmann's view⁴ when he says 'Kret. *πρεγγευταί* = *πρεσγευταί* und *πρειγευταί* (*γ* = *γγ*) = *πρεισγευταί*'. The important point for our inquiry is that here we have two different ways of attempting to commit Greek *gg* to writing, viz. by means of (i) *γγ*, (ii) *γ*.

Another clue is worth following, though it must end in a query. The common Greek verb *αἰρέω* is replaced in the Aeolic group of dialects (and in Elean) by *ἀγρέω*, which shows itself rarely elsewhere.⁵ In literary Lesbian *ἀγρέω* is familiar through Sappho (e.g. *τρόμος παῖσαν ἄγρει*), and the verb frequently occurs in the inscriptions of Mytilene and other parts of the Asiatic Aeolic area. But in the Thessalian of Pelasgiotis (Larissa) *ἐφάγγρενθεν*⁶ posits a

¹ *G.G.*, I, p. 216.

² *Greek Dialects*¹, § 86, 3a.

³ Kühner-Blass is not clear on the point. In § 34 : is said to be substituted for *σ* in *πρεῖγυς*, but in § 153, note 2, *πρεῖσγυς* is given as an original form.

⁴ *G.G.*, § 112, 3.

⁵ Homer uses the imperatives *ἄγρει*, *ἀγρεῖτε* only as exclamatory particles (cf. *δεῦρο*, *δεῦτε*), and has the derivatives *αὐτάγρετος*, *παλιν-άγρετος*, *πυράγρε*, *ζωγράφω* and *μοιχάγρια*. The related noun *ἀγρε* is of wider provenance.

⁶ Buck¹, 28⁴¹ = Cauer², 409⁴¹.

form *ἀνγρέω*.¹ Buck (§ 58c) thinks that 'the aspirate, as well as the *ν*, is probably due to contamination with some other word'; but Schwyzer (pp. 231-2) asks if *ἀνγρέω* may not stand for **āggp-* 'mit expressiver Verdoppelung des *γ*'. Schwyzer is here discussing the tendency, particularly in the *Koinē*, to write a parasitic nasal in the place of the first *p*, *b* and *t* in *pp*, *bb* and *tt* (e.g. *Καμπαδοκία, κάμβαλε, γλῶντας*).² If Schwyzer is correct in his surmise, we have the practice here extended to a guttural, *νγ* being written for *γγ* (= *gg*), a possibility I suggested earlier in this paper.

The frequent apocope of *ποτί* (= *πρός*) and the less common apocope of *μετά* in Aeolic inscriptions give two instances of *gg*, which is written *κγ*: viz. Thessalian *ποκγραψαμένας* and Boeotian *Μέκγαιο* (genitive).³

Occasionally a nasalized guttural lost its nasal quality by dissimilation when a nasal preceded, e.g. Delphian *ἀνεκκλήτως* for *ἀνεγκλήτως* and in the papyri *ἐπάνακκον* for *ἐπάναγκον* (*Berliner Urkunde*, I, 50, 13).⁴ The resultant sound is sometimes written as a single guttural in the papyri (e.g. *μετήνεκα*, *Pap. Lond.* I, pp. 42, 131). Theoretically, this dissimilation would give *gg* when the second guttural was voiced. But the ambiguity of the symbol *γγ* makes it impossible to detect this, if it occurred. A spelling with a single *γ* (for *γγ* = *gg* replacing original *ng*), on the pattern of *μετήνεκα*, would be significant, but I have been unable to find an example.

¹ So too Lesbian *ἀγρεῖς*, but Thessalian (*προ*-)*ἀνγρεῖς* (from Crannon, Buck¹, 31¹⁸ = Cauer², 400¹⁸) = (*προ*-)*αἰρεῖς*, in meaning.

² This 'irrational nasal', when not merely a habit of writing but a representation of a sound, may be connected in Asia Minor with a nasal intonation derived from the native languages of the region (Buturas in *Glotta*, 1913, pp. 170 ff.: D. Emrys Evans in *C.Q.*, XII, p. 165, who cites *ἀνγαθόν* from Miskamos and *θυγγατρί* from Kozanli). For other examples of the 'irrational nasal', in the representation of Latin words in Greek papyri, see Meinersmann's study referred to later, e.g. *ῥεγκαντος* = *recantus*, *σεμφελλιον* = *subsellium*, *Βρανταννικος*. Perhaps the English *messenger* (French *messager*), *passenger*, *scavenger* and *nightingale* may be compared.

³ Kühner-Blass, I, 1, p. 178; Schwyzer, p. 179, footnote 10, and p. 231. I do not know what to make of the Delphian *ἐγγ Ματροπόλεως*.

⁴ Brugmann, *G.G.*², § 124, 3, gives these as instances of 'Fernassimilation'. He is followed by Buck (§ 69, 3). But Mayser (op. cit., § 37) prefers

Let us now turn to testimony of quite a different order, that of the transliterations in Greek of foreign words which contained *-gg-*. The prophet Haggai comes to mind at once. This name appears in the LXX as *Ἀγγαῖος*, with some slight variants, e.g. *Ἀγγαῖος* and *Ἀγγεος*. Here *-γγ-* represents *-gg-*. While admitting that the word is not Greek and therefore not direct evidence in respect of Greek phonology, we can still claim that this spelling shows that it was not felt impossible in Greek orthography to represent *-gg-* by *-γγ-*. But what of other Hebrew names with *-gg-*? Here comes to light a strange fact—not, I think, of scientific importance, but worth noting as a curiosity—viz. that the Biblical Hebrew personal and place names which contain *-gg-* can be counted on the fingers of one hand. This is indeed surprising, since the occurrence of double-*g* is quite frequent in Hebrew. For instance, every Hebrew noun and adjective beginning with gimel has that letter doubled after the article: and all what we may call ‘Ayin Gimel’ verbs must have the central consonant doubled in certain tenses. From a study of the lists in Nöldeke, in Gray’s *Hebrew Proper Names* and the various Concordances, I can find only Haggai, Haggeri, Haggi and his descendants the Haggites, Haggiah, Haggith, and Hor-Haggidgad. Of these the second and the last are spurious instances and are represented otherwise in the LXX. This leaves only four, which are obviously of the same type (all with initial heth). Their forms, respectively, in the LXX are *Ἀγγαῖος*; *Ἀγγεῖ* (and *δῆμος ὁ Ἀγγεῖ*); *Ἀγγια* var. *Ἀμά*; *Ἀγγεῖθ*, *Ἀγγιθ*, *Ἀγιθ*, *Φεγγεῖθ*, *Φεργιθ* and omitted.

The same equivalent also appears in the very few Hebrew words, not being proper names, which chance to be trans-

to regard such forms as due to simple assimilation (of *v* to *k*), the nasalization of the first guttural being shed in the process. But all his examples have a *v* in the adjoining syllable, before or after, which suggests that Brugmann (following Kretschmer) was right in finding a dissimilative influence. Moulton, in reporting the aorist subjunctive *ἀπενέκκω* (*Class. Review*, xv, 1, p. 37) speaks of its context (*B.U.*, 246) as ‘very illiterate’.

literated. The word Higgaion appears in our English Versions appended to the seventeenth verse of the ninth Psalm, being probably a musical direction. The LXX neither transliterates nor attempts to translate, as it does with the more familiar Selah (which it renders by *διάψαλμα*). But I have found Higgaion represented, in the Second Column of Origen's Hexapla, by *εγγαων* (at ix, 17: by *εγαων* at xcii, 4). This Column provides only two further examples: *αιεγγιθ* (Psalm xxx, 10) for *הַיַּגְגִּידְהוּ* (*hăyaggīdh*) and *εγγιου*¹ (Psalm xxxii, 6) for *יַגְגִּי'וּ* (*yaggī'û*). Again *γγ* = *gg*.

There is one very noteworthy instance where a Hebrew name is not to be found in any lexicon of names found written in Hebrew, but has to be deduced from the Greek transliteration. In the genealogy of Luke III—where there was no immediate Hebrew original,² the Gospel having been composed in Greek—the name *Ναγκαί* of v. 25 was intuitively and correctly rendered Naggae, not Nangae, in the Vulgate (Nagge in the Sixtine and Clementine Recensions) and in our English versions Naggae (A.V.) and Naggai (R.V., Moffatt).³

In the *Hebrew Union College Annual*, published in Cincinnati, Vol. XII (1937), Alexander Sperber reconstructs a grammar and vocabulary of Hebrew based upon the Greek and Latin transliterations of proper names in the LXX and of other words in St. Jerome's *Onomastica Sacra* and the Second Column of Origen's Hexapla. Sperber's entry under *g* is brief and unequivocal—'*ג* is *γ*; the gemination of *ג* is transliterated by *γγ*, for instance *אֲנִי אֵלֹהִים* *ayyei*.'⁴

How can Latin help us, for many Latin words, proper

¹ It is a strange coincidence that this verb should be rendered in the LXX by so similar a form as *εγγιούειν*, especially as the verbs *nāga'* and *εγγίζω*, in their 'lexicon' forms, have so little in common.

² That is, apart from whatever document or census list that was being followed.

³ On the other hand, the true pronunciation of this name is not indicated in Pape-Benseler's, *Wörterbuch der griechischen Eigennamen*.

⁴ I gladly acknowledge my debt to Professor T. H. Robinson for drawing my attention to this useful book.

names and others, appear in Greek inscriptions and papyri? It is the story of 'Haggai and little else' again: such a word as *aggredior* immediately suggests itself, but further search reveals that *-gg-* is unexpectedly infrequent in Latin. There are only three types—compounds of *ad*, such as *aggredior*, *agglomero*, *aggrego*, *aggero*, *agger* (some twenty-two in all),¹ two compounds of *ob* (*oggero*, *ogganio*), and ten compounds of *sub* (*suggero*, *suggestus*, etc.).² The first point to notice about these words is that they would, as likely as not, be written *adggredior*, *subggero*, etc., which renders them useless for our purpose. The second point is that not one of these thirty-five words is of a type which would give rise to a proper name. The hope of finding here a transliteration illustrative for our inquiry dwindles. *Agger*, especially as a topographical place-name as in *Agger Servii* in Rome, and *suggestus* as a military term are the most promising; but I have been unable to find *Agger Servii* transliterated in any Greek literary writer,³ and a combing of the volumes of the *Corpus Inscriptionum Graecarum ad res Latinas pertinentes* brought no instance of any of these words in Greek dress. But my pains were at last rewarded: in a list of Latin words in the Greek Inscriptions of Asia Minor compiled by Professor A. Cameron⁴ there is a single example, τήν σουγγεστίονα⁵ = *suggestionem*. Here again *γγ* = *gg*.

It should be recorded here that the companion list of

¹ These figures are only approximate, for many of these words are ἀπαξ λεγόμενα and late, and the number depends on the terminal date chosen. Also it is a question whether, e.g. *aggestus*, *-ūs* and *aggestus*, *-i* are to be reckoned as one word or two, or even, with *aggestio*, *aggestum* and *agger*, all to be referred to a single form *aggero*.

² Latin Dictionaries give only one word with what seems to be a radical *-gg-*. This is *magganum*. But it is a late word of single occurrence (though apparently a prolific parent of derivatives in medieval Latin, see Ducange on *manganatio*, etc.), of doubtful spelling, and almost certainly a borrowing, probably a perverted form of μηχανή.

³ E.g. Plutarch, Dio Cassius, Dion. Hal., Strabo, Appian. *Agger* usually appears as Χῶμα.

⁴ *American Journal of Philology*, LII, No. 207 (1931).

⁵ *Bulletin de correspondance hellénique*, I, p. 33 (1877).

Latin words in the Greek Papyri compiled by Meinersmann¹ does not provide any instances.

The almost total absence of Latin (and Italic) names with a doubled voiced guttural is very strange, in view of the number of other geminations. In the numerous local lists of gentile names in Conway's *Italic Dialects* such forms as Abbia, Addia, Dellia, Mammia, Annia, Tuppuria, Turrena, Dessia and Cottia are frequent, and there is no lack of names with the unvoiced guttural doubled, e.g. Accia, Succonia, Paccia, Vaccia, etc.² Out of close on 4,000 entries only one shows -gg-, namely Eggia.³ Conway says that Eggia occurs once among the Peucetii, once among the Campani, once among the Volsci, infrequently among the Latini, often among the Hirpini—but none of these occurrences, as far as I can discover, are written in Greek letters. I note, however, a form *Eῖa* recorded in Campania, and it is possible that this represents a palatalized pronunciation of Eggia (cf. the Hellenistic *ὀλίος* for *ὀλίγος*).

Professor W. H. Porter has drawn my attention to a strange spelling for which I have found no explanation put forward and, doubtfully, here proffer my own. Editors had written *Γράκχος* in Plutarch for 'Gracchus' as the normally correct form, but the Teubner editor, Sintenis, 'restores' *Γράγχος*, because the best MSS. of Plutarch have *Γράγχος* *passim* (apart from *Γράγγος* once, *perperam*), though *Γράκχος* is the usual form of the name in the MSS. of other authors. Of later editors, Holden (1885) follows Sintenis, his only comment being 'the Greek form of his cognomen is *Γράγχος*, not *Γράκχος*, in S G': but Underhill (1892) keeps *Γράκχος*

¹ *Die lateinischen Wörter und Namen in den griechischen Papyri*, Leipzig, 1927. I regret that I have been unable to see Eckinger, *Die Orthographie lat. Wörter in gr. Inschriften*, Munich, 1892, which may discuss the point. There is nothing relevant in Wilhelm, *Lat. Wörter in gr. Inschrift.*, Wien. Stud., xlv, 1928, or in Dittenberger's earlier studies in *Hermes*, VI (1872).

² Similarly, names with -κκ- are occasionally found in Greek, e.g. *Ὀκκος*, reported by Professor J. M. R. Cormack from Beroea (*Annual of British School at Athens*, xxxix, p. 96).

³ But note the absence of -ff-.

and says in a critical note 'Title; Γράκχοι Cobet C: Γράγχοι Sintenis; so throughout'. There is no attempt here at explanation or discussion. The reference to Cobet is to his *Collectanea Critica* (1878), p. 547, where he says 'Constans propemodum librorum mendum γράγχος pro Γράκχος nollem Sintenisius recepisset, namque perinde vitiosum est Γράγχος ac si quis Βάγχος pro Βάκχος scribere vellet'. This is logical (and seems to be the only reasoned treatment of the problem)—but it does not account for the strange consistency with which the MSS. of Plutarch give the anomalous form Γράγχος. There must be some reason for this. It is to be noted that these same MSS. always offer Βόκχος 'correctly' for King Bocchus. The spelling must reflect some peculiar pronunciation. There is no possibility, of course, that it represents *Grang-khus*: it is, in effect, another clear instance of a violation of the -γγ-, -γκ-, -γχ-, -γξ- convention. But I think it may indicate a popular pronunciation 'Grag-khus' or 'Grag-cus'. If the name Gracchus is connected with *grāculus* 'jackdaw', as seems likely (cf. Gaius = 'jay', 'magpie'),¹ and not with *grācilis*, it is to be observed that a byform of this word, viz. *gragulus*, is found in Varro and the Glosses. Furthermore, since *graculus* is an onomatopoeic formation from the cry 'gra gra' of the jackdaw (cf. Quintilian, I, 6, 37), it is natural to repeat the voiced guttural.²

A more exciting speculation now presents itself. If all Hebrew texts had been lost (as was assumed by Sperber for the purpose of his reconstruction), we should have read the 'Αγγαῖος of the Greek Septuagint as Hangaïos, and have spoken of the prophet Hangae: if we knew nothing of Latin, we should, from σουγγεστίονα, enter *sungestiona* in our list of recaptured Latin words. Is there not a possibility that

¹ Walde³, Ernout-Meillet: not in Lewis and Short.

² The spelling 'Gracchus' for an early Roman *cognomen* is in itself curious, as not being a native orthography. It must indicate an attempt to Hellenize—an affectation not unlike that found in English when the surname 'Backhouse' is written 'Bacchus'. The spelling 'Graccus' is not found before the early Empire, e.g. in Ovid, *ex Ponto*, IV, 16, 31, and *C.I.L.*, VI, 1515.

in some non-Greek person- and place-names which we know only through Greek, names which contain -γγ-, the value of this representation was not *ng-g* but *gg*? Some indications have made me suspicious of certain -γγ- names in the Illyrian-Thracian-Macedonian domain, extending perhaps to Phrygia. There is a town Σίγγος in Chalcidice on the coast of Macedonia: its inhabitants, the Σιγγαῖοι, are mentioned in Thucydides, V (18, 6), and they occur as Σίγγιοι in the Athenian quota lists of cities paying tribute—and it has to be admitted that whereas ΣΙΓΓΙΟΙ occurs thirteen times, ΣΙΝΓΙΟΙ is found three times. But we have already seen that such a spelling as the latter (especially, it seems arguable, in a foreign word) is not a conclusive objection to belief in the possibility of a double-*g*. The town is mentioned once in Pliny (*N.H.*, IV, 10, 37), and there the best MSS. give Siggos. Siggos is read by Mayhoff in his Teubner edition (1906), and is given by Lewis and Short.¹

Farther north in the same area the river Βρόγγος is mentioned by Herodotus as a tributary of the Danube. His description clearly shows that this must be the Serbian Morava. This river appears as Μάργος in Strabo, VII, 12 (Casaub. 318) or 'as some call it, Βάργος' (ibid.), and as Margus in Pliny and later writers. Now the equation Βρόγγος (i.e. *Μπογγος) = Margus = Moráwa strongly suggests that the first γ in Βρόγγος is not the velar nasal but a guttural.

Another suspicious name in the vicinity is Αἰγγρος, cf. Αἰγγροκλῆς²; and, in Phrygian, is Ἀγγδιστις a nasalized or a geminated form of Ἀγδιστις? Of all these and some other names, Βρόγγος seems to me the most likely to harbour a 'concealed gemination'. But I must record that Dr. B. F. C. Atkinson, who has made a special study of Illyrian and

¹ Siggos may be a variant of the not distant Sigeum (Σίγειον), for the pronunciation of which we have the unusual advantage of the direct evidence of a pun (with *κατεσέλασεν*) recorded by Aelian, *V.H.*, xii, 13, Hercher. On the other hand, also in this region, Singidunum (= Belgrade), which shows a nasal, is probably Celtic, as the termination suggests.

² In an epitaph from Thasos, for which see Louis Robert, *Études épigraphiques et philologiques* (1938), pp. 201-2.

Thracian-Phrygian names, believes that the initial *m* in the later form of the word came from assimilation with a following nasal, cf. Bendis > Mendis.¹ My present purpose, however, is not to prove—impossible task—the presence of *-gg-* in any particular name, but to make known its possibility, so that philologists in other fields, who use material embedded in Greek records, may be aware that there is an alternative phonology.²

As a companion piece to this search for instances of *γγ* in Greek = *gg*, it would be instructive to examine the cases in which the symbol *γ* by itself, that is without a following *γ*, occurs with the value *ŋ*—what, in fact, an older generation of scholars would have called *Agma Solitarium*. It cannot occur intervocalically in Greek, as in the English (*paper-*)*hanger*, but arose before a nasal. This ground, however, has been well worked already, and Sturtevant indeed finds here the starting-point of the convention of writing *γ* for *ŋ*. The progression *γίννομαι* > *γίνομαι*, through an intermediate stage *γίννομαι*, has been generally accepted, e.g. by Schwyzler, Boisacq and Sturtevant³; but this has been rather convincingly denied by Ralph L. Ward in a recent article in *Language*.³ Ward, however, does not deny the occurrence of the ungutturalized velar nasal before *μ*. That this must occur can be shown in the following way:—

$$\pi\acute{\alpha}\upsilon\text{-}\omicron\mu\alpha\iota \text{ is to } \begin{cases} \pi\acute{\epsilon}\text{-}\pi\alpha\upsilon\text{-}\mu\alpha\iota \\ \pi\acute{\epsilon}\text{-}\pi\alpha\upsilon\text{-}\sigma\alpha\iota \text{ as} \\ \pi\acute{\epsilon}\text{-}\pi\alpha\upsilon\text{-}\tau\alpha\iota \end{cases}$$

¹ I wish here to express my thanks to Dr. Atkinson for his interesting communications. If his 'law' is to hold good for *Βρόγγος*, he must account for the loss of the following nasal.

² For instance, Ptolemy gives *Γάγγαναι* as the name of a tribe in the West of Ireland, and uses a similar name (doubtful text) in referring to the Llyn peninsula (Carnarvonshire). T. F. O'Rahilly (*Early Irish History and Mythology*, 1946) writes Gangani (p. 10), probably correctly. But there is a chance of its being Gaggani.

³ XX, 2 (1944). Ward's main points are that other words with *-γν-* (e.g. *ἀγνός*) do not show this development and that the evidence of Modern Greek is adverse.

$$\phi\theta\acute{\epsilon}\gamma\gamma\text{-}\omicron\mu\alpha\iota \text{ is to } \begin{cases} * \acute{\epsilon}\text{-}\phi\theta\epsilon\gamma\gamma\text{-}\mu\alpha\iota > \acute{\epsilon}\phi\theta\epsilon\gamma\mu\alpha\iota \\ * \acute{\epsilon}\text{-}\phi\theta\epsilon\gamma\gamma\text{-}\sigma\alpha\iota > \acute{\epsilon}\phi\theta\epsilon\gamma\xi\alpha\iota \\ * \acute{\epsilon}\text{-}\phi\theta\epsilon\gamma\gamma\text{-}\tau\alpha\iota > \acute{\epsilon}\phi\theta\epsilon\gamma\kappa\tau\alpha\iota \end{cases}$$

The forms in the last column are obviously little more than simpler ways of writing the consonantal groupings (and indicating some loss of voice in the 2nd and 3rd persons): the 1st person $\acute{\epsilon}\phi\theta\epsilon\gamma\mu\alpha\iota$ will thus be *ephthengmai*. The only question that arises is the extent of this process. Did γ before μ always become *agma*? The spelling *πραματεία* for *πραγματεία* in Hellenistic papyri has been held to suggest that it did; but I am inclined to believe that it did not, in such a case as this where the γ represented an original gamma without a nasal. In $\acute{\epsilon}\phi\theta\epsilon\gamma\mu\alpha\iota$ there was a nasal in the root, or at any rate an infixed nasal, whereas there was no nasal to start with in $\acute{\pi}\acute{\epsilon}\phi\lambda\epsilon\gamma\mu\alpha\iota$ (from $\acute{\pi}\lambda\acute{\epsilon}\kappa\omega$). The onomatopoetic letter-name $\acute{\alpha}\gamma\mu\alpha$ is sometimes cited as further evidence of the extension of nasalization. But this rests on the assumption that this word is the same as the noun $\acute{\alpha}\gamma\mu\alpha$ from $\acute{\alpha}\gamma\kappa\upsilon\mu\iota$. I believe that the letter $\acute{\alpha}\gamma\mu\alpha$ (indeclinable)—? or $\delta\gamma\mu\alpha$ —pronounced *angma*, stands with $\acute{\epsilon}\phi\theta\epsilon\gamma\mu\alpha\iota$, while $\acute{\alpha}\gamma\mu\alpha$, -*τος* 'fragment' is *agma* like $\acute{\pi}\acute{\epsilon}\phi\lambda\epsilon\gamma\mu\alpha\iota$ (*peplegmai*).

One point more. If, as we have seen, $\text{-}\gamma\gamma\text{-}$ can, on rare occasions, have the value of *gg*, would it ever have been distinguished from the conventional $\text{-}\gamma\gamma\text{-}$ by a diacritical mark? It seems a fantastic hope to search for this. Yet I have found that in Lobel's *Sappho* (1925), which is mostly a transcript of papyrus fragments, Lobel records in the critical apparatus that the name *Γογγυλα* in v, 4 is written *Γογ'γυλα* in the papyrus. Lobel does not comment on this. The same manner of writing this name also seems to occur in i, 11, but there the book-text is fragmentary. Now this lection sign ', which was known as the *κορωνίς*, was employed to indicate separation. A familiar use is in *Crisis*, to show that *χοῦτος* is to be divided into the two words *καί* and

οὗτος.¹ Elsewhere in Lobel's edition of Sappho and in his Alcaeus I find the *κορωνίς* used (i) oftenest, where our printed texts similarly mark elision—that is, showing that two closely connected words are to be separated, (ii) occasionally, where syllabic division is necessary, e.g. *αἰδρεία*, (iii) a few times between words to show their separation. Therefore it appeared feasible that this very strange *κορωνίς* in *Γογ'γυλα* might indicate that the gammas were to be sounded apart from each other, which would seem to imply that they were both gammas and not agma gamma. It is also to be remembered that Sappho's dialect was Aeolic, a characteristic of which was its doubled consonants. But Sir Harold Bell, to whom I referred the point and who has shown himself most interested and helpful, tells me that nothing can be deduced from this *Γογ'γυλα* here, because the papyrus in which it occurs happens unluckily, to be one of the latest in Lobel's collection, sixth century A.D. or even seventh, and by that time, he informs me, scribes were using lection signs indiscriminately.² But he adds that the lectional signs have not yet been made the object of a systematic study, and it may be that some evidence will still turn up to show that our coronis here is the blind memory of something that was once significant.³

¹ A common error among editors is to write *χοῦτος*. The coronis, as Housman pointed out (*C.R.*, xxxix, p. 80), is distinct from the smooth breathing, though identical with it in form. In *χοῦτος*, the aspiration is shown by the *χ*, the crasis by the coronis. Actually, these remarks *passim* refer more strictly to the *ἀπόστροφος* than to the *κορωνίς* proper, but the latter term is commonly used.

² Sir Harold Bell gives me the following examples from P. Oxy. 2235 (A.D. 598): v. 12, . . . *υἱ'νεοφύτα*; v. 16, *γεουχικά'αγροικικά*; v. 19, *τας'συνηθείας*; v. 20, *δε'δεδωκεναι*. In the first three of these, the coronis, as well as separating the words, is a sign-post against gemination. Some medial examples are: P. Oxy. 1653 (A.D. 306) *βαυλ'λιου*; P. Oxy. 1881 (A.D. 427) *εγ'γραφου* (but *σιγγουλαριων*); P. Oxy. 1882 (A.D. 504) *εγ'γυησαντο*, *αμ'μωνικος*; P. Oxy. 1837 (early VI) *αγ'γιον*, *πεμ'πι* (but *σιγγουλαριος*). It is obvious that, whatever the original use of the coronis, the later employment tended to be indiscriminate.

³ Since this was written I have discovered that J. M. Edmonds was the first to publish this fragment in England in a little book entitled *The New Fragments of Alcaeus, Sappho and Corinna* (Cambridge, 1909), and he had the following note on v. 4: 'M. γογ'γ i.e. Goggyla not Gongyla? For *gg*,

To sum up :—

We have found $\gamma\gamma = gg$ in the following :

1. In literature, in a poetical form, $\kappa\acute{\alpha}\gamma \gamma\acute{o}\nu\upsilon$.
2. In Attic literary prose, $\acute{\epsilon}\gamma\gamma\omicron\nu\omicron\varsigma$ 'grandchild'.
3. In Attic inscriptions where (e.g.) $\acute{\epsilon}\gamma\gamma\rho\acute{\alpha}\phi\omega$ is the correct phonetic representation of what was traditionally spelled $\acute{\epsilon}\kappa\gamma\rho\acute{\alpha}\phi\omega$ in literary texts following the etymology.
4. In the papyri, $\acute{\epsilon}\gamma\gamma\omicron\nu\omicron\varsigma$ 'descendant'.
5. In inscriptions other than Attic some sporadic instances, e.g. late Cretan $\pi\rho\epsilon\gamma\gamma\epsilon\nu\tau\acute{\alpha}\varsigma$.

6. In transliterations of foreign names, e.g. $\acute{\Lambda}\gamma\gamma\alpha\acute{\iota}\omicron\varsigma$, $\sigma\omicron\upsilon\gamma\gamma\epsilon\sigma\tau\acute{\iota}\omicron\nu\alpha$ from Hebrew and Latin for certain, and, possibly, hitherto unsuspected instances from lost languages.

Contrariwise, we have noted gg represented in Greek in the following ways :—

1. Regularly in inscriptions and transliterations, and abnormally in the other types listed above, by $-\gamma\gamma-$.

2. Regularly in literary texts and in the papyri, and exceptionally in Thessalian $\pi\omicron\kappa\gamma\rho\alpha\psi\alpha\mu\acute{\epsilon}\nu\alpha\varsigma$ and Boeotian $\acute{M}\acute{\epsilon}\kappa\gamma\alpha\sigma$, by $-\kappa\gamma-$.

3. Sometimes in inscriptions, by a confusion, by $-\nu\gamma-$, as possibly in Thessalian $\acute{\alpha}\nu\gamma\rho\acute{\epsilon}\omega$ and in Attic $\acute{\Sigma}\acute{\iota}\nu\gamma\iota\omicron\iota$.

4. Rarely by $-\gamma-$, as in Cretan $\pi\rho\epsilon\gamma\gamma\epsilon\nu\tau\acute{\alpha}\iota$ and in imprecise transliterations as in $\acute{\alpha}\gamma\epsilon\sigma\tau\alpha$ (*vide infra*).¹

in Boeotian, cf. Meister-Ahrens, p. 266 ; in Lesbian when $\kappa\acute{\alpha}\tau$ became $\kappa\acute{\alpha}\gamma$ before γ , $g + g$ prob. resulted, not $ng + g$; cf. $\kappa\acute{\alpha}\kappa \kappa\epsilon\phi\acute{\alpha}\lambda\alpha\varsigma$ (sic) Alc. 41 and Sa. 44 $\kappa\acute{\alpha}\gamma \gamma\acute{\epsilon}\nu\upsilon\omega\upsilon\upsilon$ (*M. \kappa\alpha\gamma\gamma\omicron\nu\omicron\varsigma*). This query of Edmonds seems to have passed unheeded.

¹ Throughout we have used the terms 'gemination' and 'double- g ' without reference to phonetic theory. I should prefer the terms 'lengthening' and 'long g ', as I adhere to the view that so-called doubling is only the prolongation of the 'moment' of tension of a single plosive.

Lengthening rather than true doubling is indicated by several factors in Greek and Latin. Geminated consonants were written singly in the earliest stone inscriptions, and approximate transliterations of *geminata* often show only a single consonant. I find the following glosses in Suidas. $\acute{\alpha}\gamma\epsilon\sigma\tau\alpha$: $\pi\omicron\lambda\epsilon\mu\iota\kappa\acute{o}\nu \mu\eta\chi\acute{\alpha}\nu\eta\mu\alpha \acute{\epsilon}\kappa \lambda\acute{\iota}\theta\omega\upsilon \kappa\alpha\acute{\iota} \xi\acute{\upsilon}\lambda\omega\upsilon \kappa\alpha\acute{\iota} \chi\omicron\upsilon \acute{\epsilon}\gamma\epsilon\iota\rho\acute{o}\mu\epsilon\nu\omicron\nu$. . . (the same under $\acute{\epsilon}\gamma\epsilon\sigma\tau\alpha$). $\acute{\alpha}\kappa\epsilon\sigma\sigma\alpha$: $\acute{\rho}\omega\mu\alpha\acute{\iota}\kappa\acute{o}\nu\tau\iota \mu\eta\chi\acute{\alpha}\nu\eta\mu\alpha$. . . $\omicron\iota \delta\acute{\epsilon} \acute{\rho}\omega\mu\alpha\acute{\iota}\omicron\iota \xi\upsilon\nu\acute{\epsilon}\theta\epsilon\sigma\alpha\nu \tau\acute{\eta}\nu \lambda\epsilon\gamma\omicron\mu\acute{\epsilon}\nu\eta\nu \acute{\alpha}\kappa\epsilon\sigma\sigma\alpha\nu \tau\acute{\eta} \acute{\rho}\omega\mu\alpha\acute{\iota}\omega\upsilon \phi\omega\nu\acute{\eta}$. These must all be attempts to render the Latin *aggestum*.