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Subtractive Versus Additive Composite Numerals in Antiquity

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1. Introduction

The numeral systems all over the world have the common characteristic that
the lowest numbers are referred to by a basic set of (different) words which
bear no formal likeness to one another, but which can be grouped in a series
in such a way that the minimal difference in meaning between the
successive members is "one." This basic set may run to "ten" or "five,"
even to "two" or "three" only, but once it is exhausted the universal method
to make further numerals is to combine the members of the basic series or
to form derivatives of them.

In the Indo-European languages this procedure starts with numbers
higher than "ten," or can be shown to have started there in former times,
because phonetic change may have blurred the original coherence: "eleven,"
"twelve" were once derivatives of "one" and "two," but these pairs have
phonetically drifted apart. The connection, however, between e.g. "six,"
"sixteen," "sixty" and "seven," "seventeen," "seventy" is clear: compounds
like "sixteen" have a meaning in which the numerical values of the
components "six" and "-teen" (a variant form of "ten") have been added
together and are therefore termed *additive* numerals, while in the
multiplicative numeral "sixty" the value of "six" is multiplied by "ten"
("-ty" being originally a variant form of "ten").

On the other hand, there are languages in which the basic set of
numerals is much earlier exhausted. In Wolof, a language spoken in modern
Senegal, "six" is "five-one," "seven" is "five-two," etc., "ten" being a
totally different word; and the same holds good of ancient Sumerian.[1]

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[1] A. Falkenstein, *Das Sumerische* (Leiden 1959) 40–41. The notable instance of languages
not having numerals other than the basic set are those of the natives of the Australian
Continent. They either count "one, two, many" or "one, two, three, many." Cf. R.M.W.

Addition and *multiplication*, however, are not the only arithmetical procedures used in forming further numerals from the basic set. A third method is *subtraction*. In Yoruba, one of the languages of modern Nigeria, "eleven" up to "fourteen" are referred to by compounds meaning "one over ten," "two over ten," etc., "twenty" by a new word which bears no likeness to any member of the basic set of numerals, while "fifteen" up to "nineteen" are compounds meaning literally "five short of twenty," "four short of twenty," etc. These latter five are then *subtractive* numerals. This subtractive procedure is followed not only in 25 to 29, 35 to 39, etc., but also for the uneven decads 50, 70, 90 up to 170, where the base can be analyzed as 10 short of three times 20, 10 short of four times 20, etc.[2] Just as the additional method, subtraction is in some languages operative already between "five" and "ten." In modern Finnish the numerals for eight and nine are derivatives for the words for "two" and "one" respectively, and are therefore subtractive from the numerical value of ten.

In the modern Germanic, Romance, and Slavic languages subtraction is not employed, but the English way of indicating the time combines both addition and subtraction: "A quarter past nine" and "half past nine" are additive, but "a quarter to ten" is subtractive.

In the following survey of the most important and best known ancient languages around the Mediterranean Sea we shall also introduce a further distinction between systematical and incidental subtractives, for it is clear that the additive "twenty nine" is part of the numeral system of the English language, while subtractive expressions like "thirty less one" and "one short of thirty" are not.

2. Latin

The numeral system of the Romans contained both additives and subtractives: *undecim*, *duodecim* up to *septendecim* on the one hand, *duodeviginti*, *undeviginti* on the other; *viginti-unus* up to *viginti-septem*, then *duodetriginta*, *undetriginta*, and so on in the further decads, the highest subtractive actually recorded being *undecentum* (Pliny, *Nat. Hist.* 7. 214).

The Roman figures used to indicate these subtractive numerals do not normally correspond with the linguistic peculiarity of the latter. *Duodeviginti* is written as XVIII or XIIX (so *CIL* V 2499) which are additions of X and VIII or IIX. *Undeviginti* is XVIIII or XIX (Dessau nos. 1999 and 2000), likewise additions of X and VIIII or IX. An example of a Roman subtractive figure actually reflecting the subtractive value of the numeral for which it stands is IIL for *duodequinquaginta* in *CIL* X 3427.

Dixon, *The Languages of Australia* (Cambridge 1980) 107–08, 120.

[2] E. C. Rowlands, *Yoruba* (London 1969) 106–07. The word for "200" is a new word and not 20 x 10. Consequently "190" is "10 short of 200."

Note that the basic numerals *quattuor*, and *sex* up to *novem* are likewise incongruously represented by the subtractive and/or additive figures IV, VI, VII, VIII/IIX, VIIII/IX.[3]

This rather striking characteristic of Latin, which distinguishes it from most of the other Indo-European languages, is not commented on by Leumann in his historical grammar,[4] although Sanskrit offers a close parallel. For by the side of the additive *navadaśa*, 19, there also occurred the subtractive *ūnaviṃśatiḥ*, "twenty less," in which *ūna-* is short for *ekona*, "less one." This alternative method could be used for all the decads plus nine up to 99, and has survived, apparently as the only method, in a number of modern Indian languages.[5]

Incidentally Latin authors used instead of the additive *undecim* up to *septendecim* the subtractive *duodeviginti* and *undeviginti* numerals formed in a different way. As the series 11 – 19 was in itself heterogeneous, there were attempts to replace the two subtractives (18 and 19) by numerals formed on the analogy of *undecim - septendecim*; and so Livy uses *octodecim* in 39. 5. 14 *tetrachma Attica centum octodecim milia*, and Scaevola in *Digesta* 33. 2. 37 *usque dum filia mea annos impleat octodecim*.

The dictionary of Lewis and Short also contained a lemma *novendecim* with references to Livy 3. 24 and Livy, *Epitome* 18 *cum annos novendecim haberet*. However, at 3. 24 the editions have *undeviginti*, while the 18th periocha does not contain the passage quoted. It is found in the 119th, in which it is said that Octavian was appointed consul *cum XVIIII annos haberet*. The lemma is no longer present in the new *OLD*.[6]

More often the whole series 11 – 19 was replaced by numerals of the types *decem (et) . . .* or *. . . (et) decem*, both being used, for instance, by Cicero in his *Pro Roscio Amerino* 7. 20 *fundos decem et tris* and 35. 99 *tribus et decem fundis*. Most probably these numerals were formed in imitation of the compounds with *viginti*, *triginta*, etc., such as *viginti et septem . . . tabulas* (Cicero *Verr.* 4. 123), *septem et viginti* (Plautus *Merc.* 430), *tres et viginti pondo* (Varro *De re rustica* 2. 4. 11). Further instances up to 19 are:

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[3] This shows by the way the danger of making inferences about the linguistic nature of a numeral system from its graphic representation by numerical symbols. In the same way the Maya figures for 6, 7, 8, 9 are combinations of a horizontal stroke and one dot, two dots, etc. The corresponding numerals, however, are four mutually different *prefixes* which in their turn bear no formal likeness to those for "five" and "one," "two," etc. either; see A. M. Tozzer, *A Maya Grammar* (New York 1977) 98–99.

[4] M. Leumann–J. B. Hofmann–A. Szantyr, *Lateinische Grammatik* I (München 1963) 293.

[5] M. Monier-Williams, *A Sanskrit – English Dictionary* (Oxford 1964⁴ repr.) 221a. Cf. J. Beames, *A Comparative Grammar of the Modern Aryan Languages, to wit, Hindi, Panjabi, Sindhi, Gujarati, Marathi, Oriya and Bangali* (Delhi 1966, repr.) II 136.

[6] Ch. T. Lewis–Ch. Short, *A Latin Dictionary* (Oxford 1966, repr.) 1219b; cf. P.G.W. Glare, *Oxford Latin Dictionary* (Oxford 1982) 1194c, 2092a s.v. *undeviginti* (Liv. 3. 24. 10).

13: *decem tres/tria* in Livy 29. 2. 17; 37. 30. 8; 37. 46. 3; 45. 43. 5 (he uses *tredecim*, however, at 36. 45. 3)

17: *decem septemque* in Nepos *Cato* I 2; Vulg. 2 Chron. 12:13; *decem et septem* in Vulg. 3 Reg. 14:21; 4 Reg. 13:1; etc.; *decem septem* in a bilingual Latin-Greek inscription at Ephesus A.D. 103–104: *sestertia decem septem milia nummum*; the amount is expressed otherwise in the Greek part: δηνάρια τετρακισχείλια διακόσια πεντήκοντα (Dessau no. 7193); *septem decem* in Aulus Gellius 10. 28, perhaps quoted from Tubero *Hist.* I.

18: *decem et octo* in Caesar *Bell. Gall.* 4. 19. 4 (but *duodeviginti* at 2. 5); Eutropius I 1; Vulg. Judices 3:14; 10:8; 20:25; etc.; Luke 13:4, 11, 16.

19: *decem et novem* in Livy 40. 40. 13; 45. 43. 5 (he uses, however, *undeviginti* at 3. 24. 10; 23. 44; 4. 34. 10. 4); Vulg. Jos. 19:38; 2 Sam. 2:30; etc. *decem novem* in Caesar *Bell. Gall.* 1. 8; Tacitus *Hist.* 2. 58 (but *undeviginti* in *Ann.* 12. 56).

It is difficult to say to what extent the mss. represent in this respect the original wording of the authors. During the manuscript tradition fully written numeral words may have been copied as figures or vice versa, but if the mss. were reliable here, our instances seem to indicate that some authors used different types side by side. The reason for doing so may have been their desire of stylistic variation. One passage, however, points rather to the opposite inclination: in 45. 43. 5 Livy combines within one passage *decem tria, decem et novem* and *viginti et septem*, probably for uniformity's sake, instead of the rather dissimilar *tredecim, undeviginti* and *viginti et septem*.

The new formations did not succeed in supplanting the series *undecim* up to *quindecim*, which have survived, be it in a modified form, in Italian, French, Spanish, and Portuguese, *sedecim* also in Italian and French. Only *septendecim* and both the subtractives *duodeviginti* and *undeviginti* are no longer extant in the Romance languages and were definitely replaced by the newer compounds. The Vulgate version of the Bible has *undecim* up to *sedecim*, then *decem et septem, decem et octo, decem et novem*,[7] and in old French likewise *dis e set, dis e uit, dis e nuef* (ca. 1190 A.D) occur. Apparently these new formations were not popular for 11 to 15/16; they may have sounded somewhat learned because of their likeness to Greek τρεισκαίδεκα (classical Attic) or δέκα καὶ τρεῖς and δεκατρεῖς (both

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[7] *duodeviginti* at 2 Sam. 8:13 is present only in the edition of the Abbey of St. Jerome (*Biblia Sacra iuxta latinam vulgatam versionem ad codicum fidem cura et studio monachorum Pont. Abbatiae S. Hieronymi in urbe* (Rome 1926–1972); the Sixto-Clementina had *decem et octo*, see B. Fischer, *Novae Concardantiae . . .* (Stuttgart–Bad Cannstatt 1977) 1669 .

Hellenistic).[8] It is, however, difficult to say why then exactly *septendecim*, which is no longer present in the Vulgate, was the exception. Only in Rumanian the complete series 11 – 19 has been given up and replaced by compounds meaning "one above ten," "two above ten," etc., which are, moreover, usually shortened to "one above," "two above," etc.

The replacement of the subtractives for 28, 38, . . ., 98, and 29, 39, . . ., 99 is certainly to be explained from the analogy of the numerically preceding *viginti-unus . . . viginti-septem*, etc. An instance outside of the Vulgate is present in Seneca *Ep. ad Luc.* 77. 20 (*Sattia) quae inscribi monumento suo iussit annis se nonaginta novem vixisse*, whereas *undecentum* is used once by his contemporary Pliny the Elder (*Nat. Hist.* 7. 214). The Vulgate version does not contain any subtractives between 20 and 100.[9]

Another kind of subtractives could be used when one wanted to express that a specific number, usually a "round number," that is a multiple of decads, was almost but not wholly involved. These were no compounds but word groups, as appears from the varying order of the constituent elements, and consisted of a) the numeral not attained; b) the word *minus*; and c) a second numeral expressing the shortage.

A well-known instance is found in Paul's Second Letter to the Corinthians 11:24: *A Iudaeis quinquies quadragenas una minus accepi*, "Five times I have received at the hands of the Jews the forty lashes less one" (RSV). As this instance goes back via the Greek to a Hebrew— Aramaic expression ensuing from a rather specific motive, it will be discussed in 5. 2. Ovid, however, offers a less complex example in *Met.* 12. 553–55, where Nestor, the son of Neleus, relates that his eleven brothers had all been killed by Hercules, but does so as follows:

> bis sex Nelidae fuimus, conspecta iuventus!
> bis sex Herculeis ceciderunt me minus uno
> viribus.

This is a poetical way of saying what Apollodorus elsewhere phrased in prose as: "He killed Neleus and his sons, except Nestor" (*Bibl.* 2. 7. 3). The phenomenon can be paralleled by many modern instances. But why is it done? Because psychologically it is not the same to say "ninety-nine" or "a hundred less one." The former is certainly less impressive, as shopkeepers know by instinct that an article sells more easily at the price of 99 cents than for one dollar.[10] For that reason alone it is less correct to translate the passage from Paul quoted above as the New English Bible does:

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[8] E. Schwyzer–A. Debrunner, *Griechische Grammatik* I (München 1968⁴) 594; F. Blass–A. Debrunner, *Grammatik des neutestamentlichen Griechisch* (Göttingen 1965¹²) par. 63.

[9] See Fischer, *Novae Concordantiae* 1669, 5293.

[10] See the remarks by J. Gonda, "Varia over indonesische telwoorden," *Bijdragen tot de taal-, land- en volkenkunde* 109 (1953) 25–27.

"Five times the Jews have given me the *thirty-nine* strokes"; but see 5. 2.

3. Greek

About the numerals in the oldest Greek that we have—Mycenaean—nothing can be said, because in the Linear B script all numbers (and there are many of them) are written in figures. As soon as numbers were written as words, that is in Homer, it appears that there are additives for numbers between decads, not only for the lower up to "seven and . . ." (ἕνδεκα *Il.* 2. 713, δώδεκα *Il.* 1. 25, δυώδεκα *Il.* 2. 637, δυοκαίδεκα *Il.* 2. 557, ἐκκαιδεκάδωρος *Il.* 4. 109, ἐπτὰ δὲ καὶ δέκα *Od.* 5. 278, ἓν καὶ εἴκοσι *Il.* 13. 260, δύω καὶ εἴκοσι *Il.* 2. 748, πίσυρές τε καὶ εἴκοσι *Od.* 16. 249, etc.), but also for those that contain "eight and . . .," "nine and . . .": ὀκτωκαιδεκάτη (*Od.* 5. 279), ἐννεακαίδεκα (*Il.* 24. 496) or perhaps ἐννέα καὶ δέκα. One may indeed ask the question whether composite cardinals are in Homer compound words already or word groups yet. Passages like *Od.* 5. 278–79 ἑπτὰ δὲ καὶ δέκα μὲν πλέεν ἤματα ποντοφορεύων· ὀκτωκαιδεκάτη δ' ἐφάνη ὄρεα σκιόεντα rather seem to indicate the latter (cf. *Od.* 16. 249).

Subtractives are, on the other hand, wholly lacking in Homer, and so likewise in Hesiod, Pindar, the Tragedians, and Aristophanes. This does not, however, imply that they did not exist, because poets abandon sometimes the current ways of expressing numbers by using circumscriptions. Hesiod, for instance, uses τρισεινάδα, "27th day," instead of ἑπτακαιεικοστήν (*Op.* 814, cf. τρεισκαιδεκάτην *Op.* 780); Aeschylus paraphrases τριακόσιαι by τριακάδας δέκα and διακόσιαι καὶ ἑπτὰ by ἑκατὸν δὶς . . . ἑπτὰ θ' (*Pers.* 339; 343). So when Pindar uses τεσσαράκοντα καὶ ὀκτώ (*Pyth.* 9. 113), this may be the numeral which he used in his spoken language, but it is also possible that he has rephrased here a subtractive numeral, and the same may be said for Homer's ἐννεακαίδεκα (*Il.* 24. 496), for as soon as we turn to prose writers it appears that subtractive numerals existed as well.

If we leave aside subtractive expressions which contain indefinite elements, such as Isaeus 11. 43 "1000 drachmae but for a trifle," Herodotus 1. 202 "all but one," Plutarch *Caesar* 30. 3 "all but a few," we may discern within the exact subtractions three types which differ a little in meaning:

A) *pure* subtractives: "forty ships less one"; the things subtracted and those from which they are subtracted belong to the *same* kind.

B) *impure* subtractives: "three drachmae less two obols," the things subtracted are of a *different* kind.

C) *combinations* of A and B: Herodotus 9. 30 ἕνδεκα μυριάδες ἦσαν, μιῆς χιλιάδος πρὸς δὲ ὀκτακοσίων ἀνδρῶν δέουσαι, all together "there were eleven myriads of men less one thousand and eight hundred";

this subtraction is *pure* because ultimately men are subtracted from men, *impure* because formally a chiliad is subtracted from myriads which are different things, although the whole is semantically equivalent to "110,000 less (1,000 + 800)." In the majority of the cases, except those of class B, the subtracted numeral (e.g. 2) is smaller than the one that otherwise would have had to be added (8 in this case). Only once, in "300 less 8" (Thuc. 4. 38. 5) is the subtracted number larger, and in "120 less 5" (Diod. Sic. 13. 14. 4) the numbers would be equal. In all cases, however, the speaker/author takes care to mention provisionally a round number which is higher than the one he would have mentioned otherwise, according to the additive method that is. But this does not imply that in the sentence the round number always precedes the subtracted number. Both orders occur; in Aristotle *Rhet.* 2. 14. 4 περὶ τὰ ἑνὸς δεῖν πεντήκοντα (*sc.* ἔτη) the round number follows the small subtracted one.

Formally, that is according to the terminology which is used, the subtractives show the following diversity:

1. Verbs (ἀπο-, κατα-)δεῖν, almost always a participle with the shortage in the genitive case, e.g. Plutarch *Pomp.* 79. 4 ἑξήκοντα μὲν ἑνὸς δέοντα βεβιωκὼς ἔτη. Aristotle *Rhet.* 2. 14. 4 quoted above is the only instance of an infinitive construction.

2. Verb δεύειν: Apoll. Rhod. 2. 974–75 τετράκις εἰς ἑκατὸν δεύοιτό κεν εἴ τις ἕκαστα πεμπάζοι (sc. ῥέεθρα), "four times would one miss in a hundred if one would count each of the streams."

3. Verbs (ἀπο-)λείπειν, participles, but in different constructions. With genitive in Diodorus Sic. 13. 14. 4 τριήρεις μὲν ἐπλήρωσαν πέντε λειπούσας τῶν ἑκατὸν εἴκοσι, "they manned triremes five missing of the 120" (the same in Isocrates 12. 270 γεγονὼς μὲν ἔτη τρία μόνον ἀπολείποντα τῶν ἑκατόν). With dative Josephus *Ant.* 4. 238 πληγὰς μιᾷ λειπούσας τεσσαράκοντα, litt. "40 stripes falling short by one" (the same *Ant.* 4. 248).

4. Preposition πλήν: Hdt. 1. 202 τὰ πάντα πλὴν ἑνός.

5. Preposition παρά with accusative: Paul, 2 *Cor.* 11:24 ὑπὸ Ἰουδαίων πεντάκις τεσσεράκοντα (*sc.* πληγάς) παρὰ μίαν ἔλαβον, "five times I have received at the hands of the Jews the forty lashes less one" (RSV). Although this passage will be dealt with in a special paragraph (5. 2) because of its Jewish background—together with Josephus *Ant.* 4. 238; 248 quoted above—some remarks are to be made here as to the way it is treated in Bauer's lexicon to the New Testament.[11] The parallel material

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[11] W. Bauer, *Griechisch - Deutsches Wörterbuch zu den Schriften des Neuen Testaments* (Berlin 1958⁵), s. v. παρά.

there adduced consists of quotations from classical authors which are *impure* examples because "days" are subtracted from "years," etc. (Hdt. 9. 33; Jos. *Ant.* 4. 176; P. Oxy. 264. 4 (see below)), or there are no definite cardinal numerals involved (Plut. *Caes.* 30. 5 see above). Of course, they do illustrate the use of παρά in subtractive constructions, but there is a better parallel which matches Paul's wording in every respect: Dio Cassius 58. 20. 5 τῷ γοῦν ἐπιόντι ἔτει, . . ., πεντεκαίδεκα στρατηγοὶ ἐγένοντο· καὶ τοῦτο καὶ ἐπὶ πολλὰ ἔτη συνέβη, ὥστε ἔστι μὲν ὅτε ἐκκαίδεκα, ἔστι δ' ὅτε παρ' ἕνα ἢ καὶ δύο χειροτονεῖσθαι, "next year there were 15 praetors, . . ., and for many years the following also happened, (namely) that at one time 16 praetors but at another time one or even two fewer were chosen." A comparable remark is made by Dio at 59. 20. 5 but there it runs: ἔστι δ' ὅτε ἐνὶ πλείους ἢ καὶ ἐλάττους.

With regard to the motivation of the subtraction the different kinds that we distinguished above (indefinite, pure, impure, combined) are not alike. The cases in which either the round number or the subtracted number or both are rendered by an indefinite numeral or adjective are always clearly motivated: "all but a few" (Plut. *Caes.* 30. 3), "one thousand drachmae but for a trifle" (Isaeus 11. 43), "fifteen talents but for a trifle" (Lysias 19. 43), "not much short of ninety years" (Polybius 12. 16. 13). In these latter three cases the shortage is considered to be so insignificant that it is not deemed worth to be specified.

Likewise when dissimilar things are subtracted (class B) these things are always in themselves relatively small fractions of the units from which they are subtracted, so that the motivation of the subtraction is self-evident. Hdt. 2. 134 "He (the pharaoh Mycerinus) left a pyramid as well but one much smaller than that of his father (Cheops); each of its sides falls 20 feet short of three plethra (*i.e.* 300 feet)"; Jos. *Ant.* 4. 176 "When forty years but for thirty days had passed, . . . "; especially in Greco-Egyptian accounts and contracts on papyrus these subtractions—usually by παρά with accusative—are very frequent: "I agree that I have sold to you the weaver's loom belonging to me measuring three weaver's cubits less two palms" (P. Oxy. II 264. 2–4; A.D. 54). This cubit, γερδιακὸς πῆχυς, probably equalled five palms.[12] The method is almost normal in the Byzantine period in prices expressed in (x) νομίσματα (χρυσοῦ) παρά (y) κεράτια, or "(x) golden solidi less (y) siliquae" (*i.e.* 1/24 solidus), of which Preisigke listed selection-wise over a hundred instances.[13] The *keration* was both a coin and a weight, and at least in a number of these cases the subtraction is not so much motivated by the wish to mention an amount in round numbers as by the fact that nominally the number of solidi was correct indeed but that these golden coins through abrasion had no longer their correct weight. This

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[12] That is, if it was the same as the linen weaver's cubit (λινοῦφικὸς πῆχυς). See F. Preisigke, *Fachwörter des öffentlichen Verwaltungsdienstes Ägyptens* (Göttingen 1915) 118.

[13] F. Preisigke, *Wörterbuch der griechischen Papyrusurkunden* . . . III (Berlin 1931) 348a–b.

appears from P. Cairo Masp. 70. 2 which contains the line, "the solidi were found to be seven keratia less" (VIth cent. A.D.).

A very special instance of dissimilar subtraction—also quoted by Bauer—is Hdt. 9. 33 ἀσκέων δὲ πεντάεθλον παρὰ ἓν πάλαισμα ἔδραμε νικᾶν Ὀλυμπιάδα. At first sight this seems to suggest that he won in four events (jumping, running, throwing the discus and the javelin) but lost in the wrestling and hence was no Olympic victor. The parallel version in Pausanias 3. 11. 6–8 states clearly, however, that he (Teisamenos) had won in two events (running and jumping), which implies that his opponent (Hieronymus) had won in the other two. On the other hand, it is known that in the final event, the wrestling, one had to be floored thrice to be the looser, and since *palaisma* also means "wrestling bout," the meaning of the whole is not so much that he won in two events, like his opponent, but lost in the final one, but rather that he won in two events and two wrestling bouts, like his opponent, but lost only the third decisive wrestling bout.

The passages in which numerical substantives are subtracted from numerical substantives or from numerals (class C) are formally not different from the kind which we have just discussed, but as, for instance, μία χιλιάς and χίλιοι are semantically hardly different, we shall discuss these cases together with the pure subtractions (class A).

The motivation of the following subtractions of small numbers from large numbers is always evident, also to our modern mind: 110,000 but for 1,800 (Hdt. 9. 30), 20,000 less 2,000 (Dion. Hal. 7. 3. 2), 10,000 less 300 (Thuc. 2. 13. 3), 1500 less 15 (Hdt. 2. 7), 300 less 8 (Thuc. 4. 38. 5), 160 less 2 (Aristotle in Diog. Laert. 5. 27), 130 less 2 (Hdt. 1. 130), 120 less 5 (Diod. Sic. 13. 14. 4), 100 less 4 (Apoll. Rhod. 2. 974–5), 100 less 3 (Isocr. 12. 270).

The most natural motivation is, of course, always that one which is provided by the context itself, as in Hdt. 9. 70 "the Greeks were in a position to kill in such a way that of the 300,000 men of the (Persian) army —less the 40,000 with whom Artabazus had fled—not even 3,000 of the remaining soldiers survived." The above quoted instance of "130 less 2" (Hdt. 1. 130), although its motivation seems clear, may nevertheless belong rather to the category with which we shall deal now, that of "decads less two/one." For although the total number of occurrences is rather small, Herodotus—in compound numerals above 20—appears to have a slight predilection for using subtractives with "less two/one," of which he has nine instances,[14] instead of additives with "and eight/nine" which he uses five times. If we assume the subtractives to be here the rule, we can offer reasonable explanations for at least four out of these five "additive exceptions."

[14] 1. 14. 16. 130. 214; 2. 157; 4. 1. 90; 5. 52; 6. 57.

Two of the occurrences of ὀκτὼ καὶ εἴκοσι ἔτεα (1. 106; 4. 1) happen to refer to the same span of time in history, to wit the number of years that the Scythians were ruling the Near East. In 1. 106 where he mentions these 28 years for the first time, he expresses them by an additive numeral because their mention happens consciously in anticipation of 4. 1—the first paragraph of his "Logos Skythikos"—where the 28 years will get a very specific illustration. He mentions these years twice there, first by using the subtractive ἔτεα δυῶν δέοντα τριήκοντα, with the reference ὡς καὶ πρότερόν μοι εἴρηται back to 1. 106, next by using again the additive ὀκτὼ καὶ εἴκοσι ἔτεα, and telling us what was so curious about these years, namely that their Scythian wives, who had stayed at home, had meanwhile had intercourse with their slaves and given birth to a new generation of men, and when the Scythians returned from Asia they were met by an army consisting of these young men. The alternating use of "additive" and "subtractive" here is no coincidence; note also the shift in the position of the substantive ἔτεα in these three phrases. A comparable situation is present in 6. 27 where he tells that the inhabitants of Chios had sent a company of a hundred young men to Delphi of whom only two returned. Next he goes on to explain what had happened to the ἐνενήκοντα καὶ ὀκτώ: an additive construction because the subtractive is already implied in the foregoing. These cases then betray a reluctance to repeat identical expressions, which is certainly also responsible for the varying order of τεσσεράκοντα καὶ τριηκόσια καὶ χίλια ἔτεα versus μυρίοισί τε ἔτεσι καὶ χιλίοισι καὶ πρὸς τριηκοσίοισί τε καὶ τεσσεράκοντα in 2. 142, and of ἑξήκοντα καὶ τριηκόσιοι versus τριηκόσια καὶ ἑξήκοντα in 3. 90. In short, it seems that in the context of these subtractives it is stylistic variation that was responsible for the use of the additives.

In 7. 186, however, this explanation does not work. We read there that the total number of the Persian army resulting from the foregoing addition amounted to πεντακοσίας τε μυριάδας καὶ εἴκοσι καὶ ὀκτὼ καὶ χιλιάδας τρεῖς καὶ ἑκατοντάδας δύο καὶ δεκάδας δύο ἀνδρῶν or 5,283,220 men. Although it would have been possible to use here καὶ δυῶν δεούσας τριάκοντα, this subtraction is probably avoided because the result would not be a round number—as in 9. 30—since there are still three additions to be made here. No explanation at all can be given for 8. 48 ἀριθμὸς δὲ ἐγένετο ὁ πᾶς τῶν νεῶν, πάρεξ τῶν πεντηκοντέρων, τριηκόσιαι καὶ ἑβδομήκοντα καὶ ὀκτώ. The exception introduced by πάρεξ did certainly not prevent the subtraction here, because πάρεξ and subtraction are found together elsewhere (1. 130); this passage must remain an exception.[15]

With "18," however, the usage seems to be the opposite of the

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[15] Hdt. 3. 89: 70 + <8> μνέας has been left out because it is due to a conjecture; it rather had to be <8> + 70, cf. J. Enoch Powell, *A Lexicon to Herodotus* (Hildesheim 1960 repr.) 100 *s.v.* εἴκοσι.

foregoing: he uses six times ὀκτωκαίδεκα,[16] while δυῶν δέοντα εἴκοσι is found only once (1. 94). Neither the additives nor the subtractives seem to be used for a special reason, except perhaps ὀκτωκαίδεκα σταδίους ἢ εἴκοσι in 1. 126, where variation may have been the reason for suppressing another εἴκοσι (δυῶν δέοντας).

In the work of his younger contemporary Thucydides, the use of subtractives is still more pronounced. Additives with eight or nine are not found at all, and instead subtractives with "two" or "one" are used eleven times, six of which are "20(th) less two/one";[17] "300 less 1" (4. 102. 3) is of course an instance which is very clearly motivated.

Further instances from prose are: Hippocrates Aff. 9 and Loc. hom. 6, both "20 less 2"; IG I 374. 405–17 (=CIA I 325) "20 less 1," "30 less 1," although the figures added have an additive structure; Xenophon Hell.1. 1. 5 "20 less 2," but on the basis of Thuc. 8. 108. 1–2 one would expect here "22" instead, so there may be an error here; Xenophon has ὀκτωκαίδεκα in Anab. 3. 4. 5; 7. 4. 16; Plato Leg. 5, 738a has "60 less 1" but ὀκτωκαίδεκα in Leg. 2, 666a and 8, 833d (the latter, however, in the close context of εἴκοσι, cf. Hdt. 1. 126 above); Aristotle Rhet. 2. 14. 4 (1390b10–11) "50 less 1"; Hist. anim. 3. 20 (522a30-31) "20 less 1"; Polit. 5. 9. 23 (1315b36) δυοῖν δέοντα εἴκοσι (sc. ἔτη) is preceded in the same paragraph by ὀκτωκαίδεκα, cf. Hdt. 4. 1 above; Plutarch Pomp. 79. 4 "60 less 1."

As compared to the language of the poets, in which as far as "18" and "19" are concerned, additive constructions occur right from the start and subtractives are absent, it is a remarkable fact that so many of the latter are to be found in prose, and that some of the additive competitors can be shown to occur there in stylistic opposition to subtractives.

This raises, of course, the question of which of the two is to be considered to represent the more original situation. In view of the rather low frequency of additives for "18," "19," etc., one wonders at least why so many grammars in their survey tables of the numerals suggest that addition was the norm here and subtraction the exception. Only Jannaris presents both as equivalent possibilities for older Greek,[18] but adds that subtraction formed no part of the spoken language.[19]

Especially with regard to subtractions from lower decads as "20" and "30," of which the motivation is no longer apparent in contexts where much higher numbers play a role, we may also reckon with the possibility that in prose some of them were replaced in the course of the long manuscript

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[16] 1.126; 2. 100. 111. 175; 3. 50; 8. 1; the numeral for 19 does not occur.

[17] 5. 16. 3; 7. 31. 4; 7. 53. 3; 8. 6. 5; 8. 17. 3; 8. 102. 1; the remaining are found at 2. 2. 1; 5. 68. 3; 8.7; 8. 25. 1.

[18] A. N. Jannaris, An Historical Greek Grammar Chiefly of the Attic Dialect (Hildesheim 1968, repr.), par. 645 and 642–43 (pp. 172–73).

[19] ibid. par. 643.

tradition, first by figures which were later "reworded" as additives, or immediately by the latter. This assumption seems quite plausible in view of the variation of numeral versus figure which occurs, for instance, in the New Testament manuscripts.

An intermediate stage is to be seen in *IG* I no. 374 in which the subtractions "20 less 1" and "30 less 1" are accompanied by figures which in Greek always have an additive structure. We believe therefore that some cases of ὀκτωκαίδεκα and ἐννεακαίδεκα in earlier prose are not original but due to the replacement process just sketched, either immediately or indirectly via the stage of figure notation. Only when a subtractive was motivated, as in 2 *Cor.* 11:24, could it resist such a rewording, and at best the higher numeral was written as a figure, here in mss. F and G: μ̄ παρα μιαν. In other cases, however, replacements are not exceptional in the New Testament. At John 5:5 the readings of the numeral vary between τριακοντα και οκτω, τριακοντα οκτω, and λη´, and instead of the frequent δωδεκα some mss. have δεκαδυο at Luke 9:17; Acts 19:7; 24:11; etc.[20]

Although this cannot be proved by textual variants, it seems not farfetched to assume that in early prose these lower subtractives were slightly more frequent than in the present state of the mss., also because the uncial (stage of the) tradition of these works must have been twice as long as that of the New Testament writings.

With regard to the subtractives in Classical Attic Jannaris remarks: "This clumsy circumlocution was hardly proper to popular speech even in *A* (*i.e.* Classical Attic) times. As a matter of course it is unknown to *N* (*i.e.* Neohellenic)" (see n. 19). This conclusion does not seem to follow with necessity from the facts as described above and is therefore not very convincing. For it is equally well possible that the use of subtractives for "18," "19," etc., was the original situation which was kept up in the everyday spoken language and in prose up to the beginning of the fourth century B.C., parallel to the situation in Latin up to the Principate.

The motivation for these subtractions from "20" may originally have been the same as that illustrated above for other numerals. In a very simple rural society "20" may have been at first a relatively high number. Not many persons owned that much sheep or cattle, but "20" lost this connotation of course, as soon as situations arose in which higher numbers were involved. The subtractives once formed may have persisted for a very long time, as Latin shows.

The spoken language as well as prose writing was probably much more conservative in this respect than the poets, who can be shown to have been innovative in specific areas of style and language. They increased, for

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[20] Xenophon has the Koine-form δέκα-πέντε only in *Anab.* 7. 8. 26, elsewhere he uses πεντεκαίδεκα (*Anab.* 4. 7. 16, etc.). *Anab.* 7. 8. 25–26, however, are generally considered to be an appendix added by a later editor.

instance, their means of varying their usage by admitting elements from other dialects, such as Aeolic πίσυρες by the side of Ionic τέσσαρες, and were also responsible for the birth of many new compounds, like those beginning with ποικιλο-, etc. They may have been the first to replace the "clumsy" subtractives, and then it is no coincidence that, for all we know, the first additives with "8" and "9" occur in poetry: τεσσεράκοντα καὶ ὀκτώ in Pindar *Pyth.* 9. 113 (474 B.C.) and ἔννεα καὶ δέκα in Homer, *Il.* 24. 496.

The gradual substitution of the subtractives, which is halfway in Herodotus, would then be comparable to what happened to the ordinal numerals. In the Attic inscriptions up to the time of Augustus[21] the compound ordinals consisted of two ordinals with intervening καί: τρίτος καὶ δέκατος, "thirteenth." This too is a rather "clumsy" way of formulating which again had its exact parallel in Latin *tertius decimus* etc., and was henceforward substituted by the type τρεισκαιδέκατος. This latter type, however, was already used by Homer, *Od.* 5. 279 ὀκτωκαιδεκάτη. Herodotus made use of both types, at least according to the mss. tradition: in 3. 93–94 he has in a series the ordinals from τρίτος καὶ δέκατος up to εἴνατος καὶ δέκατος, but elsewhere τεσσερεσκαιδέκατος (1. 84) and ἑκκαιδέκατος (2. 143 twice). Thucydides likewise has the double ordinals, nine times,[22] and ἑπτακαιδέκατος only twice, at 4. 101. 1 and 7. 28. 3; but here several editions, such as Hude's and Forster Smith's, nevertheless read ἑβδόμη καὶ δεκάτη and ἑβδόμῳ καὶ δεκάτῳ, just as elsewhere, following Krüger's conjecture; these two exceptions may indeed be due to later copyists. So if we assume that the "clumsy" double ordinal type was the original construction which was kept up in the spoken language, in prose writings and in inscriptions, it again seems likely that the type τρεισκαιδέκατος was introduced by poets; Pindar's ἑβδόμα σὺν καὶ δεκάτα. (*Pyth.* 4. 10) shows, however, that they could use the older type as well. Herodotus' use of both types of ordinals, like his use of both subtractives and additives, either reflects a transitory stage in the spoken language, or it is a conscious enlargement of his stylistic repertoire.

4. Coptic

During the greater part of its literary existence the Egyptian language was written in various consonant scripts. First in the picture-like hieroglyphs, later also in hieratic, the cursive form of the hieroglyphs, still later also in demotic, which in its turn was a more cursive form of hieratic. These three writing systems were used side by side as late as the Roman period. Only when by the side of these fourth system, the Greek alphabet, also began to

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[21] At least according to K. Meisterhans–E. Schwyzer, *Grammatik der attischen Inschriften* (Berlin 1900³) 163. We are, of course, waiting for Threatte's volume on morphology to appear.
[22] 1. 87. 6; 2. 2. 1; 5. 56. 5; 5. 81. 2; 5. 83. 4; 6. 7. 4; 6. 93. 4; 7. 18. 4; 8. 58.1.

be used for writing Egyptian, which probably was the case already in the second century A.D., this language showed for the first time its vowels. It is therefore only from Coptic, as Egyptian in Greek letters is called, that one can get a clear vision of the structure of the numeral system.

The basic set of numerals ran from "one" to "ten," and included also the decads for "twenty," "thirty," and "forty" as they bear no likeness at all to "two," "three," and "four;" the decads for "fifty" to "ninety," it is true, bear some likeness to the numerals from "five" up to "nine" but not systematically, and it is best, therefore, to consider them as basic numerals, too, just as the words for "100," "1,000," and "10,000." Alternatively, "80" was sometimes expressed or circumscribed as "4(x)20" (cf. quatre-vingts) or "50(+)30" (cf. soixante-dix) and "100" as "5(x)20."[23]

The numbers between the decads were formed in two different ways. First, there were compounds consisting of decad (10–90) and basic numeral (1–9); in these formations the decads 10, 20, 30, 80, 90 and the basic numerals 1–8 had special variant forms. For instance, "ten" was *mêt*, and "seven" was *sasf*, but "seventeen" was *mñt-sasfe*. Second, it was also possible to make word groups consisting of decad + "and" + unit, such as *maabe mñ psite*, "39" (Pach. 99b, 15 ff.) by the side of the compound *mabpsite* (Pach. 96. 9).[24] In these word groups the constituent numerals had no special variant forms. A third, alternative method was to juxtapose a decad and a compound. In this way are formed "50(+)22" for "72," and "50(+)29" for "79"; compare "50(+)30" for "80" above.[25]

Of the Old Egyptian numerals only the basic units as well as those for "100," "1,000," "10,000," and "100,000" were sometimes spelled in full, and are therefore known to us, that is to say of course, only their consonantal skeleton. All other numbers were indicated by figures, "93" for instance by repeating 9 times the sign for "10" followed by three vertical strokes for "3." The historical grammar of Coptic makes it clear, however, that the Old-Egyptian words to be postulated for "50" up to "90" are derivations of some kind from the basic numerals for 5 up to 9, possibly plurals from the formal point of view, as in the Semitic languages.[26]

The numeral system of the Coptic language did not contain any subtractive formations; of Old Egyptian nothing is known in this respect. Incidentally, however, there occur in Coptic subtractive expressions, one of them being, as might be expected, 2 *Cor.* 11:24, which is present in both the major Coptic versions of the New Testament (in the Sahidic and

[23] W. C. Till, *Koptische Grammatik* (Leipzig 1955) 84 (par. 167).

[24] Till, *o.c., ibid.*

[25] Till, *o.c., ibid.*

[26] A. Gardiner, *Egyptian Grammar* (Oxford 1957³), par. 260; E. Edel, *Altägyptische Grammatik* (Rome 1955–1964), par. 395; C. E. Sander-Hansen, *Ägyptische Grammatik*, (Wiesbaden 1963), par. 219.

Bohairic dialects). We refer again to par. 5. 2 for the treatment of this passage.

In the Greek papyri found in Egypt, prices, weights, and other measures are often expressed as a whole with a shortage, especially prices in the Vth–VIIIth centuries. Lists and accounts drawn up in Coptic show this phenomenon, too. Two instances are found on ostraca unearthed at Wadi Sarga and dating from about the same period, the VIth–VIIth centuries.[27]

The first is a shipment account of wine and runs: "+The list of the wines. We shipped from Tuho ten "hands" and six "simpula" which make seven hundred and seventy less one."[28] Apparently the "hands" and "simpula" were larger wine measures, adding up to almost the round number of 770 of a much smaller measure, which number was then preferred to the less surveyable 769, or else "770 less one" might indicate the price, and in that case "one" probably rather represents a smaller unit of currency subtracted from an amount expressed in larger units, comparable to what happens in our second ostracon.

This is likewise an account of a shipment, this time of fodder and barley: " + Lo, nineteen 'artabae' of fodder less one 'oipe,' and nineteen 'artabae' of wheat less two 'oipe' have I sent southward. + Written 10th of Mesore, 6th Indiction."[29] Of the same kind are two more instances: "fifteen years less three months" (*RNC* 40) and "seven holokottina (*i.e.* solidi) less one 'trimesion' (*i.e.* 1/3 solidus)" (P. Jkôw).[30] These four instances all betray the same preference for mentioning rather a higher number less something than a lower number plus something.

5. Hebrew and Aramaic

The numeral systems of the West-Semitic languages (Hebrew and the various Aramaic dialects, including Syriac) were all of the same structure. The basic set of numerals ran up to "ten"; the words for "eleven" to "nineteen" were additive compounds of the basic numerals and "ten"; "twenty" was formally the masculine plural of "ten", which is supposed to have replaced an earlier dual of "ten";[31] the further decads were formally masculine plurals of the basic numerals from "three" to "nine"; the numerals in between were additive wordgroups consisting of decad + "and" + basic, in which the "higher" usually preceded the "lower" element. Apparently the

[27] F. Preisigke, *Wörterbuch der griechischen Papyrusurkunden* . . . II (Berlin 1927) 232b–233a *s.v.* παρά.

[28] W. E. Crum–H. I. Bell, *Wadi Sarga. Coptic and Greek Texts* (Coptica consilio et impensis Instituti Rask - Oerstediani edita III) (Copenhagen 1922) 118 (no. 133); for *simpulum* cf. p. 112.

[29] Crum–Bell *o.c.* 150 (no. 191).

[30] Both instances taken over from W. E. Crum, *A Coptic Dictionary* (Oxford 1939) 593a–b.

[31] H. Bauer–P. Leander, *Historische Grammatik der hebräischen Sprache des Alten Testaments* (Hildesheim 1965 repr.), I 626.

system did not contain subtractive formations. Nevertheless, in post-biblical Hebrew and Jewish Aramaic literature one does find a number of instances of subtractive numerals, be it only with the formula "less one."

These instances can be divided into two categories: 1. Cases in which there is a deviation, in the sense of a diminution, from a round number given in the Bible or from an otherwise normative count. 2. Cases based upon the principle of the "fence around the Law" ($s^e yag$ la-Torah), developed in post-biblical Judaism.

5.1. Clear instances of deviations from a biblical number: In Exod. 16:35, Num. 14:33–34; Deut. 8:2; 29:5; and Joshua 5:6, it is stated that after the exodus the people of Israel wandered for forty years in the desert. In the Babylonian Talmud (= Bavli), Zevahim 118b, the rabbis say: "The duration of the Tent of meeting (i.e. the Tabernacle) in the wilderness was forty years less one. How do we know that? Because a master said: In the first year (sc. of the exodus) Moses made the Tabernacle; in the second the Tabernacle was set up" (cf. a similar passage ibid. 119a).[32] A comparable case is Talmud, Arakhin 13a: "Whence do we know that it took seven years to conquer (sc. the Land)? Caleb said: "Forty years old was I when Moses the servant of the Lord sent me from Kadesh-Barnea to spy out the land (Joshua 14:7) . . . and now lo, I am this day four-score and five years old (Joshua 14:10)." And a master said: "The first year Moses built the Tabernacle, in the second the Tabernacle was put up, then he sent out the spies. When Caleb passed over the Jordan, how old therefore was he? He was two years less than eighty years old.[33] When he distributed the inheritances, he said: "Now lo, I am this day four-score and five years old" (Joshua 14:10). Whence it follows that it took seven years for them to conquer the land."

An instance of deviation from a round number within Scripture itself is mentioned by the rabbis in Talmud, Bava Bathra 123a: "Why do you find the number seventy in their total (sc. of Jacob's sons and grandsons in Genesis 46:27) and only seventy less one in their detailed enumeration (in Gen. 46:8 ff.)?". This problem was solved by later rabbis in the following way. Pirqe de Rabbi Eliezer 39 reads: "When they (sc. Jacob and his descendants) came to the border of Egypt, all the males were enrolled (sc. in genealogical tables, to the number of) sixty-six; Joseph and his two sons in Egypt (made a total of) sixty-nine." But it is written, "With seventy persons your fathers went down into Egypt" (Deut. 10:22). What did the

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[32] Cf. Josephus Ant. 4. 176 τῶν δὲ τεσσαράκοντα ἐτῶν παρὰ τριάκοντα ἡμέρας συμπεπληρωμένων Μωϋσῆς . . . λέγει τοιάδε· κτλ.

[33] Allowing forty years for the sojourn of Israel in the wilderness. It should be noted here that the same passage recurs in Zeva him 118b where the printed editions have "78," but codex Munich reads "eighty less two."

[34] So the extant mss.; the early editions, however, read "seventy less one" probably on the basis of mss. now lost.

Holy One, blessed be He, do? He entered into the number with them, and the total became seventy, to fulfil that which is said, "I will go down with thee into Egypt" (Gen. 46:4). When Israel came up from Egypt, all the mighty men were enrolled (amounting to) six hundred thousand less one. What did the Holy One, blessed be He, do? He entered into the number with them, and their total amounted to six hundred thousand, to fulfil that which is said, "I will go down with thee into Egypt, and I will also surely bring thee up again (Gen. 46:4)."[35]

Instances with deviations from round numbers not from Scripture but from tradition: Talmud, *Jevamoth* 64a, states: "The divine presence does not rest on less than two thousand and two myriads of Israelites. Should the number of Israelites happen to be two thousand and two myriads less one, and any particular person has not engaged in the propagation of the race, does he not thereby cause the divine presence to depart from Israel?" (cf. a very similar passage in *Bava Qamma* 83a). Talmud, *Sotah* 36b: "(It was stated above that on the stones of the ephod) there were fifty letters, but there were fifty less one! Rabbi Isaac said: One letter was added to the name of Joseph, as it is said, "He appointed it in Joseph for a testimony, when he went out over the land of Egypt" (Psalm 81:6, where Joseph's name is spelt with five letters instead of the usual four, *yhwsp* instead of *ywsp*)." Talmud, *Nedarim* 38a: "Fifty gates of understanding were created in the world, all but one were given to Moses." Very curious is Talmud, *Sanhedrin* 95b: "The length of his (*sc.* Sanherib's) army was four hundred parasangs, the horses standing neck to neck formed a line forty parasangs long, and the grand total of his army was two million six hundred thousand less one. Abaye inquired: Less one *ribbo* (ten thousand), one thousand, one hundred, or one? The question stands over." Not in every case it is clear how a tradition of these round numbers (22,000; 50; 2,600,000) has come into being,[36] but for our purposes that is not important.

It should be added here that in some isolated instances in the Aramaic dialect of the Jerusalem Talmud the Greek loan-word παρά is used in its subtractive meaning: *Eruvin* 20b *shov'in min shov'in ha' ḥamishah 'alafin para' me'at*: 70 x 70 = 5000 - 100. *Demai* 24c *ḥada' para' ṣivḥad*: one minus a little bit. Cf. *Kethuvot* 30d.[37]

In general the principle is clear: a given round number, mostly either biblical or traditional, is the point of departure, and deviations from it to below are indicated by a subtractive way of counting.

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[35] G. Friedlander's translation *Pirqe de Rabbi Eliezer* (London 1916) 304, slightly revised.

[36] For other instances see *Niddah* 30a (sixty less one) and *Eruvin* 83a (seventy less one).

[37] See G. Dalman, *Grammatik des jüdisch-palästinischen Aramäisch* (Leipzig 1905 repr. Darmstadt 1960) 134 (par. 23).

5.2 The same holds for the category to be discussed now, but
nevertheless it is dealt with separately because the relevant material is
concerned with the principle of "a fence around the Torah." This principle
(formulated in Mishna *Avoth* I 1) can be described as follows: In order to
avoid that a commandment in the Torah be transgressed, rules are developed
that create a margin of safety (a "fence") around the commandment.[38] This
can best be illustrated by presenting the material under discussion. In the
Torah, in Deuteronomy 25:3, it is said: "They may give him forty strokes,
but not more; otherwise, if they go further and exceed this number, your
fellow-countryman will have been publicly degraded." The explicit
injunction "not more" made people be aware that it would constitute a
serious transgression if the person concerned would receive more than 40
strokes. Hence, as a "fence" it was ordained in post-biblical Judaism that,
for safety's sake, the punishment would consist of "forty less one" strokes,
so that, even if the executor would make a mistake in counting and inflict a
stroke too much, the man or woman would not get more than 40. Hence
the Mishna, *Makkoth* 3. 10, states: "How many stripes do they inflict on a
man? Forty less one ('*arba'im ḥaser 'aḥat*), for it is written, "by number
forty," (that is) a number near to forty".[39] For the same reason the apostle
Paul writes in 2 Cor. 11:24 ὑπὸ Ἰουδαίων πεντάκις τεσσεράκοντα
παρὰ μίαν ἔλαβον,[40] which shows that the principle is older than the
Mishna, as can also be inferred from Josephus *Ant.* 4. 238 ὁ δὲ παρὰ
ταῦτα ποιήσας πληγὰς μιᾷ λειπούσας τεσσαράκοντα τῷ δημοσίῳ
σκύτει λαβών κτλ. Cf. *ibid.* 248 πληγὰς τεσσαράκοντα μιᾷ
λειπούσας λαμβάνων κτλ. (but note that in *Ant.* 10. 77 and *Bell.* 6. 270
Josephus uses τριακονταεννέα). Two Targums (*sc.* Onkelos and Pseudo-
Jonathan, Aramaic paraphrastic translations of the Old Testament) render
Deut. 25:3 as follows: "Forty (stripes) may be laid upon him, but with one
less shall he be beaten, (the full number) shall not be completed, lest he

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[38] G. F. Moore, *Judaism in the First Centuries of the Christian Era* I (Cambridge, Mass.
1927) 259: "Avoth I 1 'Make a fence for the Law', that is, protect it by surrounding it with
cautionary rules to halt a man like a danger signal before he gets within breaking distance of the
divine statute itself."

[39] This "by number forty" is arrived at by the rabbis by linking up the final word of Deut.
25:2 *b'mispar*, "by number," with the first word of Deut. 25:3 '*arba'im*, "forty." Thus they tried
to give a biblical basis to their deviation from the biblical number. See L. Krauss, *Sanhedrin -
Makkot* (Die Mischna IV 4–5) (Giessen 1933) 369–70. Cf. the Talmudic discussion of this
Mishna in *Makkoth* 22b: "if it were written 'forty in number,' I should have said it means forty
in number, but as the wording is 'by number forty,' it means a number coming up to the forty"
(Soncino translation).

[40] On the question of how Paul could have incurred this maximum penalty see A. E. Harvey,
"Forty Strokes Save One," in A. E. Harvey (ed.), *Alternative Approaches to New Testament
Study* (London 1985) 79–96.

should add to smite him beyond those thirty-nine and he be in danger."[41]

There is another instance in the Mishnah that is sometimes referred to in this context,[42] wrongly in our opinion. In *Shabbath* 7. 2 the context is a discussion of the types of work forbidden on sabbath. The text runs: "The main classes of work are forty less one (*'arba'im haser 'ahat*)." The same tradition is found in the Midrash, *Numbers Rabbah* 18. 21: "The principal categories of work (forbidden on sabbath) are forty less one." At first sight one would expect that there is a fixed number 40 in Scripture or tradition relating to this issue. But there is no such number, and if it were there, the Mishnah would make no sense, for the principle of "a fence around the Torah" would demand in that case *more*, not *less* than 40 kinds of forbidden labour. So this principle cannot be at work here, and it is very hard to say what is the reason for this specific way of counting here. Sidney Hoenig's suggestion, "The 40 mentioned biblically in the case of *malkot* (punishment by lashes) was utilized for application in a parallel manner for the sabbatical prohibitions,"[43] is not and cannot be proved. Even if that would apply to the use of the number 40, it definitely does not apply to the formula "40 less 1," since the "fence-principle" is operative in only one of the two cases, not in both. One might, however, suggest that the use of "40 less 1" instead of "thirty-nine" in the case of forbidden kinds of work may have been a rather mechanical transfer of terminology which existed already longer (for the 39 strokes), to a different situation in which the same number (39) played a role, albeit without the same background. It is, therefore, interesting to see that in the Midrash *Mekhilta de Rabbi Ishmael*, Shabbata 2 (III p. 206 Lauterbach) it is stated in connection with Exod. 35:1 ("And He said unto them: These are the words etc."): "Rabbi says: This includes the laws about the thirty-nine (*sheloshim we-tesha'*) categories of work prohibited on the Sabbath which Moses gave them orally." The fact that in this passage the usual additive numeral is used makes clear that "forty less

[41] See also H. L. Strack - P. Billerbeck, *Kommentar zum Neuen Testament aus Talmud und Midrasch* III (München 1926) 527–28. J. le Moyne, *Les Sadducéens* (Paris 1972) 239. G. F. Moore, *Judaism* II–III (Cambridge, Mass. 1927–1930) II 27–28, III 171. Characteristically, the later Syriac version of 2 *Cor.* 11:24 uses about the same words as the Mishnah: *'arba'in'arba'in hasir hada'*, "each time forty less one" (Peshitta *ad loc.*; cf. Vulgate *quadragenas* instead of *quadraginta*). It is uncertain whether the terminology in *Acta Pilati* (*Evang. Nicodemi*) 4:3 (λέγουσιν οἱ Ἰουδαῖοι τῷ Πιλάτῳ· ὁ νόμος ἡμῶν περιέχει· ἄνθρωπος εἰς ἄνθρωπον ἐὰν ἁμαρτήσῃ, ἄξιός ἐστιν λαμβάνειν τεσσαράκοντα παρὰ μίαν, ὁ δὲ εἰς θεὸν βλασφημῶν λιθοβολίᾳ λιθοβολείσθαι αὐτόν) depends upon 2 *Cor.* 11:24 or shows independent knowledge of Jewish custom.

[42] E.g. W. H. Roscher, *Die Zahl 40 im Glauben, Brauch und Schrifttum der Semiten*, Abh. der phil.-hist. Klasse der kön. sächs. Akad. der Wiss. 27:4 (Leipzig 1909) 25. This study by Roscher is a supplement to his *Die Tessarakontaden und Tessarakontadenlehren der Griechen und anderer Völker*, Berichte über die Verhandl. der kön. sächs. Ges. der Wiss., phil.-hist. Klasse 61 (Leipzig 1909).

[43] See S. B. Hoenig, "The Designated Number of Kinds of Labor Prohibited on the Sabbath," *Jewish Quarterly Review* 68 (1978) 205.

one" had not become a fixed expression in relation to types of work forbidden on Sabbath, unlike the forty less one strokes. Also clear is the fact that the forty less one types of work are later than the forty less one strokes (Paul precedes the Mishna by one and a half century). One might suggest that the number of types of work prohibited on Sabbath—performance of which made one liable to beating[44]—was worked out to match the number of blows in the beating and therefore the same form of numeral was used.[45] But this is no more than an educated guess. It seems to be impossible to state with certainty what was the background in this case.

6. Conclusions

It may have become clear that the principles operative behind the use of subtractive numerals are definitely not the same in all languages discussed in this article. For Latin it was already known that subtractives were very old elements that remained in use for a long time (till the first centuries of our era) but then gradually disappeared and hence are no longer part of the Romance languages. As to Greek, however, subtractives have either been totally neglected by modern scholars or considered to be a rare and clumsy irregularity in the otherwise additive system. Now it turns out to have been a usage of much wider currency than has always been thought. Most probably it was, as in Latin, an element of the early spoken language that has persisted in prose writings till the end of the Classical period. Contrary to the classical languages, in Semito-Hamitic languages (Egyptian, Coptic, Hebrew, Aramaic) subtractives have never been part of the numeral system. Hence there are considerably fewer instances, but, as far as Hebrew and Aramaic are concerned, in almost all these cases it could be demonstrated that the use of subtractives was caused by the existence of a normative round number from which there is a deviation to below. To this category, and only to this, belongs the only passage in the Bible where a subtractive numeral occurs, 2 *Cor.* 11:24.

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[44] Flogging is the punishment for all kinds of violations, by overt act, of negative biblical injunctions (Mishna, *Makkoth* 3:1–9); see H. H. Cohn, *Encyclopaedia Judaica* 6 (1972) 1349; Z. W. Falk, *Introduction to the Jewish Law of the Second Commonwealth* II (Leiden 1978) 160.

[45] We owe this suggestion to Prof. Morton Smith of New York (letter of 25 September 1985).