standard works of Newberry, Petrie, and Alan Rowe produced no good parallel.[1] "Ladder" legs are well known from the thirteenth to the sixteenth dynasties and even in the eighteenth,[2] and the cross patterns with bars between the intersecting horizontal and vertical lines are familiar enough, but nowhere has the writer been able to find anything which approximates this "ladder" motif at Beitin. There can be no doubt as to the date of the scarab impression. Its style conforms closely to that of the late Hyksos period.[3] The design as a whole is a characteristic conventionalization of Egyptian signs, and has no particular meaning other than the word *nefer*, the symbol of excellence, fineness, or beauty. The owner, prompted by a belief in the efficacy of similars, may have felt that the scarab-impression would bring him good luck or at least ward off ill. In any event, to find a "ladder" at Bethel is unusual!

THE LISTS OF ZERUBBABEL (NEHEMIAH 7 AND EZRA 2) AND THE HEBREW NUMERAL NOTATION

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The lists of Nehemiah 7 and Ezra 2 in the Masoretic text show a number of differences. The accompanying table indicates that out of 153 individual numerals or ciphers 29 are different, by a straight count.[1]

The question arises as to the causes of these differences, since both lists seemingly refer to the same occasion and the same facts. Some students have supposed that the lists are from different occasions and that therefore the changes represent growth in the community. However, an even casual examination will disclose that this cannot be so—though it might certainly be true that some numbers represent revisions based on additional information.

Nor does the proposition that confusions might have occurred because letters of the alphabet may have been used for numerals commend itself, upon closer investigation.

Some difficulties might be traced to the present form of the text, where all numbers are spelled out in words. Thus Azgad 2000 to 1000

[1] The cross patterns in Flinders Petrie, *Hyksos and Israelite Cities* (London, 1906), Plate IX, Nos. 140, 188, 189, all Yehudiyeh scarabs, may be compared; see also his *Buttons and Design Scarabs* (London, 1925), Plate IX, Nos. 372, 374, and the Yehudiyeh scarabs 1527, 1528. But these all conform much more closely to the ribbed patterns. Among the inscribed jar handles, the double lines are common, but the only ones in the Palestine Museum of Antiquities which seem to have anything suggesting "rungs" are the Shebna seal from Tell en-Nasbeh, the Bakyah seal from Ain Shems, and possibly the Shaban seal from Tell ed Duweir. But even in these the "ladder" motif is by no means clear.

[2] Petrie, *Buttons and Design Scarabs*, p. 18.

[3] Mr. Lankester Harding, Père de Vaux, Père Couroyer, and Père Vincent all reached the same conclusion independently upon examination of the impression.

[1] The significance of the divisions of this list, the circumstances of its organization and contents, will form another study.

and Bethel-Ai 100 to 200 might mean the loss of a dual *mem* or *vice versa*. And Arah 775, which is the only number in which the digits stand before the tens ("seven hundred five and seventy"), should most prob-

The Lists of Zerubbabel in Nehemiah 7 and Ezra 2 Compared

	Neh.	Diff.	Ezra
Parosh	2172		2172
Shephatiah	372		372
Arah	652	+ 123	775
		[+ 105	757]
Pahath-moab	2818	- 6	2812
Elam [first]	1254		1254
Zattu	845	+ 100	945
Zaccai	760		760
Binnui (Bani)	648	- 6	642
Bebai	628	- 5	623
Azgad	2322	-1100	1222
Adonikam	667	- 1	666
Bigvai	2067	- 11	2056
Adin	655	- 201	454
Ater-Hezekiah	98		98
Hashum	328	- 105	223
Bezai	324	- 1	323
Hariph (Jorah)	112		112
Gibeon (Gibbar)	95		95
Bethlehem and Netopha	188	- 9	123 56
Anathoth	128		128
Beth-azmaveth	42		42
Kiriath-jearim, Chephirah, Beeroth	743		743
Ramah, Geba	621		621
Michmas	122		122
Bethel, Ai	123	+ 100	223
Nebo	52		52
Magbish	---		156
Elam second	1254		1254
Harim	320		320
Jericho	345		345
Lod, Hadid, Ono	721	+ 4	725
The Senaah	3930	- 300	3630
Priests:			
Jedaiah	973		973
Immer	1052		1052
Pashhur	1247		1247
Harim	1017		1017
Levites:			
Jeshua	74		74
Asaph Singers	148	- 20	128
Gatekeepers	138	+ 1	139
Temple Servants	392		392
Delaiah, Tobiah, and Nekoda	642	+ 10	652
All the Qahal	42360		42360
Slaves	7337		7337
Singers	245	- 45	200
Horses	736		736
Mules	245		245
Camels	435		435
Asses	6720		6720

ably be assumed to follow the regular formula ("seven hundred fifty and seven") to read Arah 757, the Hebrew being simply a plural *mem* and feminine ending interchanged. Perhaps once a whole number has

been skipped, as Magbish 156, or 45 dropped so that Singers 245 became 200. However, the last item may have been subject to a different vicissitude: we notice another number 245 just one line down, and it could be that an original 200 was unconsciously completed into a 245 by *lapsus oculi*. There are a number of such possibilities: Parosh and Shephetaiah (72 and 72), Binnui and Bebai (648, 628), Adonikam and Bigvai (67 and 67), Hashum and Bezai (323, 223), Bethlehem and Anathoth (188, 128), Michmas and Bethel (122, 123). A like assimilation might explain Adin 55 from 54. A scribe or a reader accustomed to chanting the scriptures with certain tones or cadences and rhythms would be more liable to such slips. And yet this does not provide an adequate explanation for all the differences in the lists.

Now it is a well known fact that in ancient Aramaic documents vertical strokes were used for digits and horizontal strokes for tens. The vertical digit strokes were generally grouped together in threes. The horizontal strokes for ten had generally a downward hook on the right, and they were placed one above the other to form a double hook for twenties, this double hook taking on the appearance of a wide figure " 3 " with a small tail (three score and ten would therefore become three double hooks and one single). For the hundred a stylized *mem* was used plus vertical strokes for units to indicate how many hundred; for the thousand an abbreviation of the word plus strokes for units and a hook for ten and double hooks for twenties to indicate how many thousand. The system had certain affinities to the hieroglyphic numeral notation and also to the cuneiform.

This system is attested by the Aramaic papyri from Egypt from the 6th to the 4th centuries B. C., by Aramaic endorsements on cuneiform tablets from Mesopotamia at least from the 7th century onward, by Aramaic ostraca found in Palestine (Samaria excavations), by Phoenician inscriptions from the 4th century onward, by Nabatean a century before and after the beginning of the era, and by Palmyrene in the 2d and 3d centuries A. D.

In addition to this, Nabatean and Palmyrene also had a special sign for " 5." In Nabatean it looked like our hand-written 5, only lacking the top-stroke; in Palmyrene it consisted of a vertical stroke with an angular downward side-stroke from the left, almost in the shape of a printed letter " y." Neither Egyptian Aramaic nor Phoenician inscriptions have yet shown such a sign; their digits run by unit strokes up to nine. However, some early Mesopotamian Aramaic scribes appear to have used such a sign, for in an Aramaic endorsement from 680 B. C. the cuneiform sign for seven is represented by a sign very much like the later Palmyrene sign for " 5 " plus two vertical strokes. Here we might have evidence of an early ancestry for the later Palmyrene and Nabatean signs.[2]

[2] See Mark Lidzbarski, *Handbuch der nordsemitischen Epigraphik* (1898), vol. 1, p. 199; compare also *CIS*, II, 17. Other later endorsements do not show a sign for " 5." For instance, A. T. Clay, in *Business Documents of Murashu Sons of Nippur* (Univ. of Penn. Museum Publ. of the Bab. Sec., vol. 2, nr. 1, 1912), in an appendix printed fifty-four Aramaic dockets, mostly from the time of Artaxerxes I and Darius

As for the Hebrews themselves, there is no doubt they too employed the same principles of numeral notation. Hebrew ostraca from the kingdoms regularly show vertical strokes for units. But furthermore, the Hebrew ostraca from Samaria (before the Assyrian destruction) show also more than twenty occurrences of what has been judged to be "15," consisting of a sign for "10" looking like a Greek *lambda*, and a sign for "5" like an early *gimel* having an upright with a horizontal top-stroke to the left.[3] Evidently the same signs were used in the Tell ed-Duweir letters (before the Babylonian destruction of Judah): the strokes for units are plainly present, the "10" has been identified, as in letters 9 and 10, and W. F. Albright has cautiously read also the sign for "5" in letter 9, which seems plain enough from Lankester Harding's hand copy published by H. Torczyner.[4]

It is therefore clear and certain that the Hebrew language also wrote its numerals in the way characteristic of the age; definitely vertical

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II. Thirteen of these, at least, show a vertical stroke for "1," a horizontal stroke for "10," doubled for "20." In seven cases a digit number of from 5 to 7 is present, but in each of these the numeral is represented by the corresponding unit strokes without the use of a sign for "5." A sign for "5" from Egypt (fifth century B. C.) has been suggested by Emil G. Kraeling, *The Brooklyn Museum Aramaic Papyri* (1953), pp. 260-263, in Papyrus Kraeling 11, line 4. However, this seems rather the second stroke of a "3" drawn slanting (just a *lapsus calami*), plus a small spot left by an attempt at correction. Actually Anani is withdrawing 2 *prsn* 3 *s'n* of spelt and binds himself to return the same. The letters *KP* are the abbreviation for *KNTN PRSN*, the words already used, readily jotted down by a grain dealer's scribe who was accustomed to shorten such terms thousands of times. The same measures of grain are seen abbreviated in Kraeling 17:3, 4, 5, only with barley (*š*) instead of spelt (*K*); similarly Cowley 63:2, 3, where in line 3 the larger measure is abbreviated, the smaller (*seah*) is not, just as in Kraeling 11:4; compare also Cowley 24 using another measure (*'rdb*) and barley. The measure *prs* must have been very large, something in connection with standard storage cubicles, vats built of clay (found also by excavators at Elephantine, vats rather than *pithoi*), or average transportation loads; such would also certainly constitute standard periodic grain allotments; perhaps compare elsewhere in the ancient Near East the *homer* or *kor* of 11-12 bushels, two-fifths of a cubic meter, which was standard according to Ezekiel 45:11. The extra few *seah* in each case given above might indicate that the grain came or was stored in "loads" which were then adjusted to the standard. (It would hardly seem probable that *KP* || should be read as "double," for if *BYWM* | *BKP* | of Kraeling 7:24, Cowley 15:28, etc., means "at one time," i. e., "in one payment," then *BKP* ||—with the *B* and perhaps rather the dual—should mean "in two payments," i. e., "in two instalments.")

[3] See G. A. Reisner, and others, *Harvard University Excavations of Samaria 1908-1910* (Harvard University Press, 1924), vol. 1, pp. 224-248.

[4] W. F. Albright, *BASOR*, 70 (1938) 16, and 82 (1941) 23; *Ancient Near Eastern Texts*, ed. by J. B. Pritchard (1950), p. 322; compare H. Torczyner, *The Lachish Letters* (1938), p. 133.

Ostracon OC 1101 from Samaria, probably 8th century, displays what are most likely unit strokes and a sign for "10" of the horizontal variety (E. L. Sukenik, *PEFQS*, 1933, pp. 152-156, pl. III, and W. F. Albright, *PEFQS*, 1936, pp. 211-215). Furthermore a number of weights found at Tell ed-Duweir also carry a sign which appears most obviously to be a "10" (ten-shekel weight), less probably a "5" (double-shekels?); the sign is of the shape and angle of the Greek *lambda*, but possibly of the *gimel*-type "5"; the suggestion that here this sign should be read as an "8" is hardly valid, for the "ten" and "five" shekel weights were common, though they may both have lacked exactness with respect to the shekel (Ezek. 45: 12).

strokes for digit units, obviously a sign for "10," and in all probability a sign also for "5," besides logically some marker for "100" and for "1000."

Now, what numeral notation was used in the lists of Nehemiah 7 and Ezra 2? A tabulation of the differences shown in our table (assuming Arah as 757 and disregarding for the time the loss of Magbish 156 and Singers 45, thus reducing the individual differences to twenty-three) reveals that in thirteen cases a single unit stroke "1" is involved: eleven times either dropped or added, once a "1" and a "5" confused (Lod), once probably a "1" for a "10" (Bethlehem 123 for 132)—and if "5" and "10" were like those of the Samaria ostraca they could easily each be taken for a vertical stroke if damaged. In four cases a single "5" is involved (twice dropped, once added, once substituted for a "1" as already mentioned—or *vice versa*); and twice the difference is "6," but that will be a "5" and a "1." In other words, out of these eighteen individual differences fifteen contain a unit stroke and six have trouble with a sign for "5" (counting here twice those that have both). And besides these only two cases of differences involve other numbers of units, namely once "2" (Adin 600 to 400) and once "3" (Senaah 3930 to 3630). The conclusion appears overwhelming as to the kind of numeral notation this indicates.

So far this applies to the thousands, hundreds, and digits, where unit strokes were used to show the number. Examining the tens, we find the only differences are two "10" and one "20" (Bigvai "20" and "10" confused?), each also a single sign (besides the case of Bethlehem "10" for "1" already mentioned). Thus again we obviously have confirmation of the old numeral notation. And even if some other adjustments are assumed, such as reading the difference for Arah 123, counting the 45 singers, proposing other complications for Adin and Bigvai and for Hasum (were there two?) and even for Bethlehem and Netopha (addition?), this picture does not essentially change.

One more point should be made: a system involving single strokes for units will be cumbersome when digit-numbers go up to 8 or 9 (even if "5" consists of a down-stroke with a side-stroke). And, precisely, in our two lists the highest percentage of differences occurs on the numbers 8 and 9. Of the two "9s" one has lost a "3," and of the ten "8s" seven show differences (four times dropping one stroke, three times a stroke too many to make "9," or *vice versa*, "80" and "90" not involved).

It is not an indispensable assumption that a special sign was used for "5," though several indications favor this; in one case, Adin 655 to 454, a sign for "5" in the difference seems to be contradicted, though here there is most likely some other difficulty (even Codex B on 1 Esdras shows 454).

This then entirely changes the situation with respect to the differences between the two recensions of Zerubbabel's lists. While in some instances there may probably be several explanations for some of the difficulties, the larger share are certainly best explained by the proposition that originally these lists had employed the early Hebrew-Aramaic numeral notation, and the problems are largely inherited from that notation. It is

relatively easy for single strokes to be overlooked or to be miscounted, specially on ancient papyrus, which tended to be fragile and quickly flaked, fractured, or wrinkled.[5] Since it is easier to assume a sign thus overlooked or effaced than added (except where a large number of strokes might cause a miscount), the Nehemiah list may be earlier, there being more minuses from Neh. 7 to Ezra 2 than *vice versa*.

Quite certainly the sanctuary and governor's records held more than one copy of this earliest census of the Jerusalem temple and its Palestinian supporters, for a census like this was in a way a charter and constitution. One copy was preserved in Nehemiah's "papers," with a special note of the governor's goodwill gifts on the census occasion (Neh. 7:5, 70). But the compiler knew that the temple building (and its establishing census) was of Zerubbabel; if there was a temple record, should it not belong with his story? Scribes varied in skill, a revision or two might be made, the records would differ in preservation, continued use would have its effects. Thus we have duplicate accounts slightly varying, an excellent and instructive principle which meets us so often in the Bible, in creation, laws and ten commandments, histories of the kings, even the gospels.

No variants in these lists are traceable with any probability to difficulties with numerals written by the use of alphabetic letters. Evidence of confusion between similar letters is absent. It follows that the old Hebrew-Aramaic numeral notation of strokes and signs was transcribed directly into words spelled out. While the earlier numeral notation was used in the Hebrew kingdoms, and later in the time of the Persian control, the idea of using letters for numerals was received from the Greeks (or, anyway, at the time of Greek influence) and appears first, as far as we now know, on the Maccabean coins. It is significant that the earliest Jewish coins have distinct Greek motives and imitations.[6] Popular adoption of the new notation may have hastened the transcription of the earlier biblical system into spelled-out words, but the letters-for-numerals system itself does not seem ever to have been used in the Hebrew Scriptures except much later as chapter and verse numeration.

It is to be hoped that this feature of the transmission of Hebrew documents will be more fully illumined.[7] The change may be one of those rather significant little signs of what took place when Judaism moved intellectually from the Aramaic world of the Achemenian Empire to a western Hellenistic world (which continued into the Roman). Text-critically it might be informative.[8]

[5] The Aramaic papyri from Egypt (both Sayce-Cowley and Kraeling publications) show examples of such vicissitudes; evidently in two cases (Sayce-Cowley D = Cowley 8, and Kraeling 6) a sign for "20" ("day 21 of Mesore," "day 28 of Tammuz") has disappeared in a crease or in a small break even where the superficial reading or restoration is seemingly clear without that sign; similar situations for unit strokes of "1" can hardly be enumerated here, the appearance of the numeral in "year 9" of Sayce-Cowley J (= Cowley 25) is one of the typical possibilities. See also date in Sayce-Cowley E.

[6] *The Biblical Archaeologist*, 9:1 (Feb. 1946) 13, 15.

[7] Evidence of numerals among the Dead Sea finds has not yet been published and was not available for this study.

[8] Certainly the principles of the numeral notations employed by the Hebrews must

In conclusion, as for the lists in Nehemiah 7 and Ezra 2, while at first glance these textual-numerical differences may seem detrimental, actually they greatly enhance the value of the lists, as they bring out much of their real nature and age—remains of ancient census lists made by the builders and supporters of the restoration and reform sometimes called " the Second Temple," documents vested with reality and antiquity by the very blemishes and signs of use they exhibit.[9]

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be investigated carefully also in the interpretation of the king lists, annals, and possible other records which may underlie the Old Testament book of Kings; elaborate manipulations of " accession " and " non-accession " reckonings or spring or autumn new years as sometimes resorted to seem less plausible for explaining problems of single units of digit numbers, to the exclusion of other factors, one of which is the numeral notation itself.

[9] The Greek of Ezra 2 and Nehemiah 7 (Second Esdras 2 and 17) corresponds closely to the Masoretic text: Codex A and S have retained (re-introduced) Magbish 156 in the Nehemiah portions; Codex S reduplicates Asen 223 for Hashum (Asoum, Asem; were there two?); there are disturbances in Arah, Azgad, Adin, where we have found secondary trouble at work in the Masoretic; numerals have dropped out in Zattu, also of the Nehemiah portion; probably three cases show a mishearing involving *eta* and *beta*, as used in Greek numeral notation.

First Esdras (" Greek Esdras," Third Esdras in the Latin) presents variations quite intriguing; there are two sets or patterns of deviations, Codex B and Codex A; the former is demonstrably secondary to a common Hebrew, in large part distorted by severe copying trouble, the latter tertiary, if we may say so, descending from the text of B but returning to the Greek of Second Esdras for corrections. See the author's article in a forthcoming number of *ZAW*.