JN FORMULAS AND GROUPS

GRATITUDE to Professor Blegen is of many kinds, for he has done so much to bring the third and second millennia B.C. to life and order on both sides of the Aegean. Not least should be the thanks of the happy few who will continue for many years to find in the tablets which Professor Blegen discovered the innermost details of Pylian economy and society.

Continued examination of the Jn bronze-allotment texts [1] may serve two purposes: 1) a new understanding of scribal practices through the collection and interpretation of formulaic phrases; 2) a new insight into the grouping of smith through the examination and comparison of bronze-allotment amounts. As far as the first point is concerned, the reasoning is as follows: comparatively small differences in records which are for the most part patterned and formulaic demand explanation; if the records which share a particular peculiarity are also different from all the others in some material respect, the peculiarity could be shown to arise from a difference in content; where, as here, records which share a particular formula are in general no more closely related to one another in other respects than to records which employ a different formula, it is probable that the reason for the differences and similarities is not inherent in the material of the record but is a matter of presentation only. If the series of tablets were the work of various scribes, differences in formula and pattern might be related to differences in hands; but if, as here, the bulk of the comparable material (all but Jn 658, 706) is by one hand, the only possible explanation of divergence in presentation must be sought in the records from which the present tablets were compiled or copied.

Certainly scribes of the central organization would always have been dependent on records sent or brought in from the outlying districts. Whether those documents were written by local scribes or by agents from the central organization is immaterial as long as it is unlikely to the point of impossibility that one scribe could cover all the districts. That is, the slight variations which appear in the midst of overall uniformity should be attributed to the idiosyncrasies of individual scribes from whose records the present tablets were more or less unthinkingly copied. How this may have been and what some of the peculiarities are will appear below in the analysis of records for bronze-allotment totals.

[1] The texts here in question are those from Pylos which record allocations of bronze to smiths; Jn 829 is not included. For earlier studies see Ventris and Chadwick, *Documents*, pp. 352-356 (with bibliography); L. R. Palmer, *Mycenaean Greek Texts*, pp. 279-286; M. Lejeune, "Les forgerons de Pylos," *Historia*, X, 1961, pp. 409-434; M. S. Ruipérez, "En torno a la serie Jn de Pilo," *Minos*, VIII, 1963, pp. 37-50; G. Pugliese Caratelli, "I bronzieri di Pilo Micenea," *Stud. class. e orient.*, XII, 1963, pp. 242-253; H. Geiss, "Some Remarks on PY Jn 725 and other Texts," *Mycenaean Studies*, 1964, pp. 27-35.

I—Jn 601	II—Jn 725	III—Jn 431, 433, 389
Heading: *po-wi-te-ja ka-ke-we ta-ra-si-ja e-ko-te*	*e-ni-pa-te-we ka-ke-we ta-ra-si-ja e-ko-te*	431 *a-pe-ke-i-jo ka-ke-we ta-ra-si-ja*[*e-ko-te*]
No. Men: 14	26 (or 27?)	10
Amounts: range from 4 to 12 M	no individual amounts	range from 4 to 7 M
Other: *to-*[*so*]*-de e-pi-da-to 7 qa-si-*[*re*]*-u pa-qo-*[*si-jo*]		*qa-si-re-u a-pi-qo-ta*
Total: *to-so-pa ka-ko* AES 3 M 12[+	]*ka-ko* AES 2 M 18	*to-so-de ka-ko* [AES 1] M 24
* * * *	* *	* *
Heading: *to-so-de a-*[*ta-ra-si-jo ka-ke-we*]		*to-so-de a-ta-ra-si-jo ka-ke-we*
No. Men: between 5 and 9		15
* * * *	* * *	* *
Heading:	]*-nu-we-jo*	433 *a-pe-ke-e ka-ke-we po-ti-ni-ja-we-jo ta-ra-si-ja e-ko-te*
No. Men:	5	6
Amounts:	range from 3 to 5 M	range from 3 to 6 M
Total:		*to-so-de ka-ko* [ ]M 27
* * * *	* * *	* *
Heading:	*a-ke-re-wa ka-ke-we*	389 *a-ka-si-jo-me ka-ke-we ta-ra-si-ja e-ko-te*
No. Men:	4	3
Amounts:	no individual amounts	range from 1 M 2 N to 3 M
Other:		*to-so-de e-pi-da-to pa-si* M 6
Total:	*to-so-de ka-ko* AES M 12	*to-so-de ka-ko* AES M 27

Fig. 1.

(The second paragraphs of Jn 433 and 389 have been omitted, for the sake of saving space and because the material which they present is not particularly relevant; both have the *to-so-de a-ta-ra-si-jo ka-ke-we* heading; Jn 433 then goes on to list both men and numbers of men; Jn 389 merely lists five men.)

The fact that two (Jn 601, 725) out of the fourteen comparable Jn records [2] each show a total of 108 M leads immediately to speculation about whether this agreement is coincidental or in some way significant. Speculation may be supplemented by actual inquiry, since the combination on Jn 725 of three groups of smiths shows that the total of 108 M may be made up of various sub-totals and authorizes us to look for other combinations which total 108 M. Immediately rewarding is the combination of Jn 431 and 433, which are certainly two related records written on the same tablet, whether it was broken apart before or after the writing; the first of these shows a sub-total of 54 M, or just one-half of 108; the sub-total of the second is 27 M, or one-half of 54 and one-quarter of 108. It seems both proper and necessary to seek out another tablet to add the last quarter; the only one of those preserved that has a 27 M total happens also, surely not by coincidence, to have the same width as Jn 431 and 433; it is Jn 389.

We have then three clear examples of a group or groups of smiths whose allotments total 108 M. Before testing further the extent and significance of this number, let us look more closely at these three records; see p. 398, Figure 1.

Similarities and Differences among Records, I, II and III

1) Of the seven groups which make up the three records (one in I, three in II,[3] three in III) all five which begin tablets have the same basic heading: [4] toponym or ethnic followed by *ka-ke-we ta-ra-si-ja e-ko-te* (433 adds *po-ti-ni-ja-we-jo* to the *ka-ke-we*); the two which follow the first group on Jn 725 (B and D) have abbreviated headings: simply ethnic; or simply toponym and *ka-ke-we*. This abbreviated form appears in no other record [5] and so may be explained only in relation to other peculiarities exhibited by Jn 725; see below under 2) and 5).

[2] Of the 29 Jn tablets (excluding Jn 829) two belong to a different hand (Jn 658, 706) and so perhaps to a different set (see Appendix), one (Jn 832) is both too different from all the others and too incomplete for inclusion to be anything else but confusing, and twelve (Jn 410, 413, 881, 896, 927, 937, 939, 942, 944, 1065, 1067, 1164) are too fragmentary to be useful in this connection.

[3] That is, the three paragraphs which may be designated A, B and D. Paragraph C was erased and reappears in a different form as Jn 692. An explanation of the erasure is attempted below in the Appendix.

[4] Although Jn 433 was written on the lower half of Jn 431's tablet, the two were purposely broken apart and should count as two tablets, even though they are closely related through the ethnic of 431 (*a-pe-ke-i-jo*) and the toponym of 433 (*a-pe-ke-e*).

[5] The preserved headings of Hand 2 (Bennett, *Atti del 2° Coll. int. Pavia*, 1958, pp. 34 ff.) are as follows:

Jn 310 A	*a-ke-re-wa*	*ka-ke-we*	*ta-ra-si-ja*	*e-ko-te*
Jn 310 B	*po-ti-ni-ja-we-jo*	*ka-ke-we*	*ta-ra-si-ja*	*e-ko-te*
Jn 320	*o-re-mo-a-ke-re-u*	"	"	"
Jn 389	*a-ka-si-jo-ne*	"	"	"
Jn 415	*ru-ko-a_2-ke-re-u-te*	"	"	"
Jn 431	*a-pe-ke-i-jo*	"	"	"

2) Again five of the seven groups show individual amounts of bronze which range from 1 M 2 N to 12 M; the other two (Jn 725 A, D) show no individual amounts. Since individual amounts appear on all other records, this peculiarity of Jn 725 A, D must be explained in terms of that tablet's other peculiarities; see below under 5). Groups which show a range in the individual amounts of bronze (similar to the range above) are also found on Jn 310 B, 320, 415, 478, 693; other groups show identical amounts for all men listed (Jn 310 A, 605, 692, 750, 845 of Hand 2 and Jn 658, 706 of Hand 21). Since the groups with identical amounts for all individuals have no other feature in common which distinguishes them from the groups with ranges and since the two groups on Jn 310, though otherwise so close, differ in this respect, it is likely that this internal distribution was a matter of local option (i. e., at the discretion of each group); the palace then would have simply copied the particular practice as it appeared on the local record.

3) Two of the groups (Jn 601, 389) add an extra amount of bronze to be divided among all; because in each case the extra amount brings the total for the whole group up to 108 M, it may well be that this was the purpose. This kind of addition would then be found only in the last or only group of any particular corporation.[6] Since Jn 725 D, as the last group of that corporation, does not give individual amounts, no extra quantity to be divided among all is necessary. If other groups were associated in corporations we might expect other last groups to show an extra amount to bring the total up to 108 M. But our extant records show no other extra amount at all. Perhaps the reason for this is that the last group in every other corporation employed the system of identical individual allotments rather than the range-system. Both our extra amounts (Jn 389, 601) occur in the context of a range of allotments which suggests that some factor (now unknown) dictated the differing individual amounts and so produced a total which was smaller than the whole group's allotment so that the extra amount had to be divided among all. If, however, the last group of a

Jn 433 *a-pe-ke-e ka-ke-we po-ti-ni-ja-we-jo ta-ra-si-ja e-ko-te*
Jn 478 *wi-ja-we-ra$_2$ ka-ke-we ta-ra-si-ja e-ko-te*
Jn 601 *po-wi-te-ja* " " "
Jn 605 *a-pi-no-e-wi-jo* " " "
Jn 692 *na-i-se-wi-jo* " " "
Jn 693 *a-[ke]-re-wa* " " "
Jn 725 A *e-ni-pa-te-we* " " "
Jn 725 B [ ]*-nu-we-jo*
(Jn 725 C *na-i-se-wi-jo ka-ke-we ta-ra-si-ja e-ko-te*)
Jn 725 D *a-ke-re-wa ka-ke-we*
Jn 750 *a-si-ja-ti-ja ka-ke-we ta-ra-si-ja e-ko-te*
Jn 845 [ ] " " "
Of Hand 21: Jn 658 *ka-ke-we ta-ra-si-ja e-ko-si e-ni-pa-te-we*
Jn 706 " " " *pa-to-do-te.*

[6] For ease of reference the super-group which has a total allotment of 108 M will be called a corporation.

corporation had identical individual allotments these could be either the result of dividing a known number of men into the group allotment or of assigning to men the appropriate number of previously fixed allotments. In either case there would have been no need for an extra amount to be divided among all.

4) Two of the groups (Jn 601, 431 A) note the local chief; since there seems to be absolutely no reason why this item should appear in these two instances (and also on Jn 845) but in no other groups, it is probable again that this was a matter of local option and the palace merely copied local records.

5) Six of the groups show totals of bronze allotments; compare also Jn 320, 413, 415, 478, 658, 706, 845. The absence of a total in Jn 725 B makes it like Jn 310 A and B, 605, 692, 693, 750. Here at last a peculiarity of Jn 725 is shared by other tablets which may serve to test any theory devised to explain Jn 725's various peculiarities (the lack of full headings in B and D; the absence of individual amounts of bronze in A and D; the absence of a total in B). Rote copying of local records might be invoked to account for these peculiarities, but this would not so much solve the problem as push it back one step. Not only would two of the practices still be unique but also it would be an incredible coincidence that the only three groups with two unique practices should belong to the same corporation. The most obvious explanation, since all the peculiarities are omissions, is lack of space. And when we note that on this tablet more groups are combined than on any other Jn record, we conclude that the lack of space belongs to the combination at the palace rather than to the local group records.

Before going on to apply this theory in detail to Jn 725 we shall do well to test it by studying the use of space on the other Jn records, particularly as it relates to the presence or absence of totalling lines. The standard pattern for one-group tablets which include totals is as follows:

paragraph of smiths with allotments
one blank line
line with totalling formula
one blank line
paragraph of smiths without allotments.

This pattern appears on Jn 320, 389, 413, 414, 433, 478, 706 and 845; the number of blank lines at the bottom varies on these tablets from none to four. The only other variations seem equally insignificant: two (rather than one) blank lines come after the first paragraph on Jn 320; two lines in the totalling paragraph of Jn 845, one of which gives the *qa-si-re-u*; use of the reverse for additional lines on Jn 706. The only one-group tablets with totals which differ in pattern are Jn 431, 601 and 658: all three omit the blank line between the first paragraph and the totalling line; the third also omits the blank line between the totalling line and the third paragraph. For at least two of these (Jn 431, 658) the omission of blank lines seems to have been

dictated by the likelihood of inadequate space. It may be then that the omission of the totalling formula itself is the result of even more cramped conditions.

Let us look at the format of the tablets without totals:

Jn 310 A—smiths with allotments
one blank line
smiths without allotments
one blank line
slaves
one blank line
310 B—smiths with allotments

Jn 693 A—smiths with allotments
one blank line
B—smiths with allotments

Jn 725 A—smiths with allotments
one blank line
line with total
three blank lines
B—smiths with allotments
one blank line
C—smiths with allotments
line with total
D—smiths with allotments
line with total
two blank lines

Jn 605—smiths with allotments
one blank line
smiths without allotments
one blank line
slaves

Jn 692—smiths with allotments
one blank line
smiths without allotments

Jn 750—smiths with allotments
smiths without allotments

It looks very much as if the blank lines setting off paragraphs were the last things to be sacrificed to the demands of space. Apparently, the first thing to go was the blank line between the smiths with allotments and their total allotment (Jn 431, 601, 658, 725, C, D). The next thing was the totalling line itself (Jn 310, 605, 692, 693). Finally, even the blank line between paragraphs was given up, but the reluctance to go to such lengths is shown by the fact that it happened only once in our texts (Jn 750).[7] A further indication that blank lines were a matter of concern to the scribe may be seen in Jn 389 where the totalling formula was first written in the line immediately following the smiths with allotments, then erased and rewritten so as to leave a blank line.

With this background in the layout of Jn records we may examine Jn 725 in detail. It now seems probable that considerations of space caused the scribe to record the unusually large number of smiths with allotments (26 or 27)[8] in Jn 725 A in paragraph form without individual amounts. Otherwise, what now occupies seven

[7] The arrangement of Jn 658 which leaves no space between the totalling line and the smiths without allotments is not really relevant here, since the lack of names in the second paragraph may mean either that the record was not completed or that in the absence of smiths without allotment this was not considered a new paragraph. In either case the fact that the scribe of Jn 658 is not the same as the regular Jn scribe allows another variable.

[8] The next largest group has only 17 (Jn 750).

lines would have required at least twelve by the average maintained in other equivalent paragraphs.[9] Presumably he could omit the individual amounts because they were identical; this requires that the number of men be 26, each with 3 M, so the mutilated end of line 3 had only one name. The scribe then continued in accordance with the usual pattern, leaving one blank line and recording the total allotment in the next. His next move is at first puzzling, since he left three lines empty instead of the expected one, an extravagance particularly notable after the thrifty care shown in the first paragraph. But when we note that the *to-so-de a-ta-ra-si-jo ka-ke-we* rubric is missing here, it seems probable that the scribe wished to leave open space for at least one line of smiths without allotment. That he was right in expecting at least one such smith is indicated by the fact that the only group in the bronze allotment records (except on this tablet) which omits this rubric is Jn 693.

In Jn 725 B the scribe reduced the usual heading to the simple ethnic (or toponym?), omitting *ka-ke-we ta-ra-si-ja e-ko-te*. Apparently he was still feeling pressed for space but could not repeat the space-saving form of listing which he had used in 725 A because here the five smiths have different and unequal allotments. But by omitting three words from the heading and also the totalling formula he saved two lines so that he could again leave a blank line before 725 C. The practice of such economy thus far suggests that he did not know how much more he would be expected to write on this tablet, but the single empty line here compared to the three empty lines after 725 A above suggests that he was sure that there were no smiths without allotments in this group.

Since the two groups which he had already recorded had a combined allotment of 96 M, the third group which was to be added should have a sub-total of 12 M. When the scribe cast around for the final group to round out the corporation total of 108 M, he must have picked up by mistake the preliminary list of *na-i-se-wi-jo* because its total was 12 M. Only when he had copied that completely did he discover (or someone pointed out to him) that *na-i-se-wi-jo* did not belong to this corporation. Because there seemed to be room enough on the tablet (especially if he drew the final lines rather closer together than those above) for the proper group from *a-ke-re-wa*, he did not erase C enough to replace it with D but just to cancel it. When he actually began to write paragraph D, however, he thought he might be cramped for space if he copied the usual heading in full (i.e., *a-ke-re-wa ka-ke-we ta-ra-si-ja e-ko-te*) so he left off the last two words; he also used again the space-saving device of paragraph A by omitting the individual amounts of the smiths' allotments. This was possible because the total allotment was equally divided among the four smiths.[10]

[9] Of the 60 lines in smiths-with-allotments paragraphs of Jn 310, 320, 389, 415, 431, 433, 478, 601, 605, 692, 693, 750 and 845 (omitting Jn 658 and 706 as belonging to another hand) 51 lines have two names with their amounts and only nine lines have three names. The average is 2.15 names to a line.

[10] Obviously this reconstruction of the way in which Jn 725 was written can not be proved;

This survey of all the bronze allotment records through a comparison of the three corporations has demonstrated the overall uniformity which must stand as the strongest argument for extending the concept of corporations to the other records. The following tablets, comparable in every way to the five which made up the three corporations above, are available for assignment to other corporations:

No.	Toponym/Ethnic	Smiths with Allotments		Total Allotment
310 A	*a-ke-re-wa*	8	1 M 2 N each	12 M
310 B	*po-ti-ni-ja-we-jo*	4	2-3 M range	11 M
320	*o-re-mo-a-ke-re-u*	12	3-5 M range	56 M
415	*ru-ko-a₂-ke-re-u-te*	7	4-5 M range	34 M
478	*wi-ja-we-ra*	7	3-4 M range	26 M
605	*a-pi-no-e-wi-jo*	6	1 M 2 N each	9 M
692	*na-i-se-wi-jo*	2	6 M each	12 M
693 A	*a-*[*ke*]*-re-wa*	3	4-8 M range	16 M
693 B	*a-pu₂-we*	7	3-4 M range	26 M
750	*a-si-ja-ti-ja*	17	1 M 2 N each	25 M 2 N
845	[ ]	8	1 M 2 N each	12 M

If the association of groups in corporations was an indication of geographical proximity the assignment of these groups would be comparatively easy. Let us look then to see to what extent geographical relations play a role in the three corporations above: I) since *po-wi-te-ja* is alone in its corporation, no relative geography is involved; II) the ethnic (*a-pe-ke-i-jo*) and toponym (*a-pe-ke-e*) of Jn 431, 433 are as obviously related as are the two tablets, but since neither appears elsewhere in the Pylos archives we have no indication of location, either absolute or relative to the *a-ka-si-jo-ne* of Jn 389, also a *hapax legomenon*; III) although *a-ke-re-wa* as one of the Nine Towns has a well-defined geographical context, neither *e-ni-pa-te-we* nor]*-nu-we-jo* appears on any other tablets and so can not be related either to *a-ke-re-wa* or to each other. Obviously, insufficient evidence makes it impossible to determine whether the three corporations are geographical in character. But if the construction of other corporations with total allotments of 108 M each should prove to involve geographical proximity, the reasonableness of this as an organizing principle would provide welcome confirmation both of the corporations set up and of the geographical relations in Jn 431, 433, 389 and in Jn 725. Certainly the collocation of *a-*[*ke*]*-re-wa* [11] and *a-pu₂-we* on Jn 693 favors such an assumption since these two recur in reverse order in various lists of the Nine Towns (Cn 608, Jn 829, Vn 20).

its chief virtue is that it not only points up the inconsistencies in the record but also suggests a consistent explanation of how they came to be.

[11] Lejeune's effort (*Historia*, X, 1961, p. 432) to discredit the reading *a-*[*ke*]*-re-wa* seems to me both transparently motivated and unsuccessful.

Since groups on both Jn 310 and 693 are identified with *a-ke-re-wa*, the possibility that these groups are related to the *a-ke-re-wa* group of Jn 725 D must not be overlooked, and this may very well give us a start on the fourth corporation. That is, if the corporations were made up in a geographical order, it would be likely that a fairly large community might have to be split up among two, especially if it was already divided up internally. Thus, one section of *a-ke-re-wa* provided the four smiths with allotments who fill out the Jn 725 corporation, another provided the eight smiths of Jn 310 A. That this latter was the true or " spiritual " center of *a-ke-re-wa* is suggested by the four smiths designated as *po-ti-ni-ja-we-jo* in Jn 310 B. So we are not surprised to see a third section of *a-ke-re-wa* providing three smiths with allotments on Jn 693 A. With the *a-pu₂-we* group of seven smiths on Jn 693 B we are so well launched on the make-up of Corporation IV that there is literally only one way of completing it from the extant records; that is, by the addition of Jn 415 and Jn 605, necessarily in that order so that the final group is one with identical individual amounts so that no extra amount is needed:

No.	Toponym/Ethnic	Smiths with Allotments		Total Allotment
310 A	*a-ke-re-wa*	8	1 M 2 N each	12 M
310 B	*po-ti-ni-ja-we-jo*	4	2-3 M range	11 M
693 A	*a-[ke]-re-wa*	3	4-8 M range	16 M
693 B	*a-pu₂-we*	7	3-4 M range	26 M
415	*ru-ko-a₂-ke-re-u-te*	7	4-5 M range	34 M
605	*a-pi-no-e-wi-jo*	6	1 M 2 N each	9 M
				108 M

Unfortunately, the addition of Jn 415 and 605 supplies little evidence concerning geographical proximity since *ru-ko-a₂-ke-re-u-te* is *hapax legomenon* and the various contexts of *a-pi-no-e-wi-jo* (An 37, 207, Mn 1408, Nn 228, Vn 130) do not provide geographical definition.

A fifth corporation may be put together, but lack of geographical information [12] renders that criterion useless:

No.	Toponym/Ethnic	Smiths with Allotments		Total Allotment
320	*o-re-mo-a-ke-re-u*	12	3-5 M range	56 M
478	*wi-ja-we-ra*	7	3-4 M range	26 M
750	*a-si-ja-ti-ja*	17	1 M 2 N each	25 M 2 N
				107 M 2 N

[12] Jn 320 *o-re-mo-a-ke-re-u* is *hapax legomenon*; although *wi-ja-we-ra* of Jn 478 and *a-si-ja-ti-ja* of Jn 750 appear on other tablets, no connection can be established between them. This is probably the result of *wi-ja-we-ra's* limited context: *pi-*82*, *a-pa-re-u-pi* and *ma-ro-pi* in Cn 643 and 719. *A-si-ja-ti-ja* appears more often but ordinarily without geographical context; the only certainty is that it is one of the so-called Seven Towns (Jn 829, On 300).

Whether the absence of the final 2 N necessary to make a total of 108 M is a serious objection to this corporation is difficult to determine, especially as long as the significance of the 108 M is obscure. That the 108 M is significant, however, is confirmed by the closeness of these group allotments (56 M, 26 M, 25 M 2 N), whatever the corporation make-up may have been, to the half and quarter of 108. Various explanations of the 108 M might be suggested, but there is not now enough evidence to choose among them: 1) 108 is readily divisible by 2, 3, 4, 6, 9 and 12 and so makes a total convenient for a variety of uses; 2) 108 might have been the basic allotment (1 M 2 N each) of an original corporation of 72 men which was later divided in a variety of ways;[13] 3) 108 M is nine-tenths of 120 M (4 L) and might indicate a system in which the bronze distributed was tithed by the central authority, so that of every 120 M 12M were kept and only 108 M distributed.

Of the fourteen more or less complete Jn records of this type and hand (see note 2 above) only Jn 692 and 845 have not been assigned. If we may judge from the fragments of similar tablets, at least one and more probably two other corporations must have existed. That is, the evidence suggests that virtually all of the tablets in this series of records are represented; this is suggested by the way in which the Archives Room and Annex were destroyed and excavated, with only those fragments completely lost which fell close enough to the walls to be pulled out by the stone robbers or which were high enough in the fill to be carried off by the plow; the apparent fact that several other series of tablets are 80 to 100% completely represented by tablets and fragments (e.g., An *o-ka* tablets, En-Eo series, Es records, Ma and Ta tablets) makes it likely that the survival rate of the Jn series was similar. At any rate, it seems highly improbable that as many Jn tablets are missing as the chart of Lejeune (*op. cit.*, p. 429) suggests; in this he shows that in various Ma and Na records smiths are mentioned in connection with several toponyms which are not represented at all in the Jn series but should be, according to Lejeune. In this connection a rather puzzling peculiarity of Pylian toponymy should be noted: the surprisingly large number of place-names relative both to the likely limits of a Mycenaean kingdom and to the number of place-names in the probably more extensive geographical coverage of the Knossos tablets. If we use the lists in *Documents*, pp. 150 ff. as a rough indication we see that there are only about 55 toponyms at Knossos in contrast to *ca.* 155 at Pylos. Still more impressive is the fact that almost two-thirds of these 155 (101) appear in association with only one ideogram; that is, in the N series appear about 36 place-names which appear nowhere else; similarly about

[13] It is interesting in this connection that the numbers of men who are allotted bronze in our various corporations are so close to being factors of 72: 14 (Jn 601), 27 (Jn 431, 433, 389), 35 (Jn 725), 35 (Jn 310, 693, 415, 605), 36 (Jn 320, 478, 750). These numbers exhibit a kind of tension between 70 (as a multiple of 7 or 14) and 72 (as a multiple of 6 or 12) which was observed also in the Es records (where 280 and 282 seemed to combine basic sixes and sevens; see my article in *Mycenaean Studies*, pp. 37-52).

the same number occurs in the A tablets and nowhere else; about 12 place-names appear only in the C series, and so on. Some 22 toponyms occur with two different ideograms; about eight each with three and four ideograms and only about 16 with five or more ideograms.

The pattern of distribution and the number of toponyms both point to a likelihood that named areas overlap, with one name having two or more applications so that place-names are not always parallel, but there may be names within names. Just as, for example, Argos may refer to the town, the district or all of Greece, so *pe-to-no*, for example, may refer not only to a town but also to a district. It is even possible that the so-called Nine Town list of Cn 608, Vn 20, etc. is actually a list of nine districts in some or all of which the chief town may have had the same name. Also included in each district and even in each town must have been sub-areas which because of the terrain or the gregariousness of particular producers and craftsmen were devoted to particular kinds of produce. So, for example, in the district of *pe-to-no* there would have been a town *pe-to-no*, both district and town would have had localities or quarters with other names of their own: areas devoted to sheep-raising, lands used for wheat production, others for flax, quarters for bronze-smiths, etc. It is even possible that named areas overlapped in another way: the whole southern part of a district (X) might have been called Y in records accounting for some product which was collected from the area as a whole while some part of the area which was alone in its production of something else might have been called Z; thus Z would be a part of Y which was in turn a part of X; the names of the parts or the name of the whole would be used in accordance with the purpose of the particular record. So for various purposes (usually taxation) a U. S. citizen's residence may remain fixed but be recorded variously in accordance with the particular relevance: village, township, county, state.

This re-examination of bronze allotment tablets has not only attempted to achieve its two original purposes but also suggested an explanation for the multitude of toponyms. That is, it has shown that at least some differences in extant texts result from rote-copying of the records from which they were compiled and that similarity of bronze totals go beyond the scope of coincidence to require an organization of smiths into corporations of various size but equal capacity. The possibility that the corporations were organized geographically combined with the great number of " one-ideogram " toponyms to make reasonable the assumption that places had different names in the context of different functions.

APPENDIX

Of the 17 names (one erased) on Jn 658, 13 indubitably appear also on Jn 725. Three of the remaining four should perhaps also be identified with names appearing on Jn 725 in slightly different form, the difference being possibly the result of mis-pronunciation, misspelling, misreading or even alternate forms:

	Jn 658	Jn 725
1)	*ma-ka-wo*	*ma-ka-ta*
2)	*wa-ḳa-ta*	*ẉa-tu-ta*
3)	*po-ru-e-ro*	*o-ru-we-ro*

1) the *wo* of *ma-ka-wo* is unclear, being damaged by the adjacent break; it could be a slightly malformed *ta*; 2) the editor admits doubt of the *ka* of *wa-ka-ta* in Jn 658, which might therefore be *tu;* 3) the *po* of *po-ru-e-ro* is very faint along the left edge, so that the remaining strokes could as well belong to an *o*; that the glide (semi-vowel *w*) is not always present is seen from a_2-*ra-tu-wa* (An 519.4) and a_2-*ra-tu-a* (Cn 3.3). Because the identification of these three additional names makes the comparison between the two texts both more complete and more challenging, let us assume it for the present.

It seems clear that the order of names in the tablets is related in some way because the number of juxtapositions is too great to have been the result of chance. That is, even if we do not drop out the names that occur on only one, we may see the following pairs:

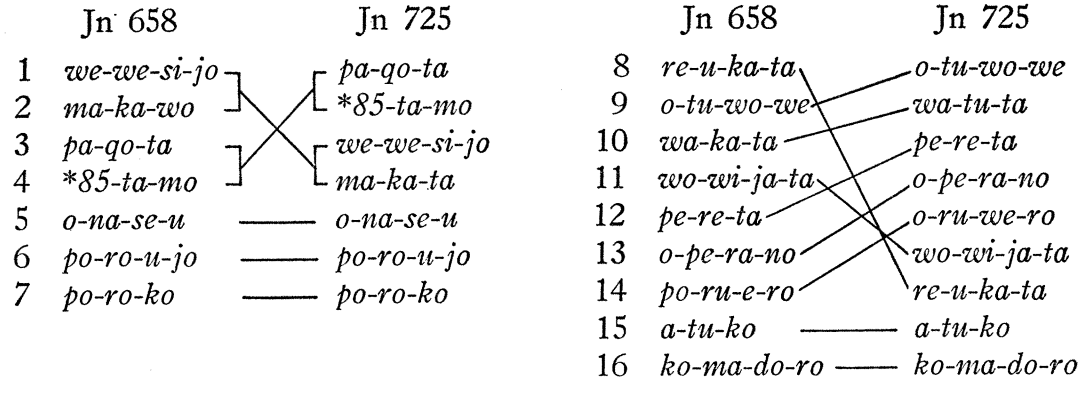
*pa-qo-ta *85-ta-mo* (side by side on both)
po-ro-u-jo po-ro-ko (side by side on 725; over and under on 658)
wa-tu-ta o-tu-wo-we (side by side on both)
wo-wi-ja-ta o-ru-we-ro (over and under on both)
o-ru-we-ro o-pe-ra-no (side by side on both)
a-tu-ko ko-ma-do-ro (over and under on 725; side by side on 658).

Juxtapositions of more than two names have not been listed because that would be to prejudge the question as to the order of reading. For this question (of reading order) these two tablets are of primary importance, but the related question of which tablet is earlier and the nature of their relationship must be considered at the same time. Here at least there are only three possibilities: 1) 658 is the original from which 725 was adapted; 2) 725 is the original from which 658 was adapted; 3) both were adapted from a third list which is no longer extant. Any explanation of the order of reading must show how whichever was the original was read to produce the order of writing in the copy or copies.

Again, we have one piece of comparatively firm ground in the shifting sands of our inquiry: the order or direction of *writing* is certainly from left to right. The spacing makes this clear, as may be seen merely by leafing through the facsimile-drawings in, for example, *PT II*. When names are written in paragraph-form rather than list-form, the direction of writing is also certainly horizontal, but equal certainty is not attainable for those tablets that show names arranged in two (or more) columns. The usually good alignment of the columns suggests either that with considerable foresight room was left for the longest possible name in the first column

when the scribe (writing horizontally) started the second column or that the writing was vertical, first the column at the left, then the column(s) to the right. It may well be that both horizontal and vertical listing occurred, and that the obvious difference beween paragraphs and columns was the result. It is possible and even probable that the same scribe may have used both methods in different situations; so the differences between Jn 725 and Jn 750 caused the same scribe to use the two different forms: 1) the need to conserve space on Jn 725, with 26 names in seven lines as opposed to Jn 750's 17 names in nine lines; 2) the inclusion of individual bronze amounts in Jn 750 and the absence of these in Jn 725. Nor is there any reason to think that the two forms of listing might not be mixed, at least to the extent of sometimes writing two or three names in one column, then switching to the other and bringing it down to the same level. That is, columnar listing opens the way for greater variety in the order or direction of both reading and writing than paragraph-listing. Even in our very strongly left-to-right oriented reading and writing we often find ourselves switching from horizontal to vertical order and back again.

Granted then that the Jn 725 paragraph-list had to be written line by line from top to bottom and left to right, the list from which it was taken must have been readable in that order, i.e. *pa-qo-ta, *85-ta-mo, we-we-si-jo, ma-ka-ta, o-na-se-u, wa-tu-ta, o-tu-wo-we, po-ro-ko, po-ro-u-jo, pe-re-ta, o-pe-ra-no, o-ru-we-ro, a-tu-ko, re-u-ka-ta, wo-wi-ja-ta, ko-ma-do-ro.* By "readable in that order" we should understand not only a paragraph reading from left to right or columns read vertically but also either a paragraph or columns read from right to left or *boustrophedon.* This original could not have been Jn 658, since that list must begin with either *ma-ka-wo* or *we-we-si-jo.* Nor can Jn 658 have been copied from Jn 725; the reason is the same. But the close connection between the orders of the two lists is indubitable and becomes most striking if both are read *boustrophedon,* thus:[1]



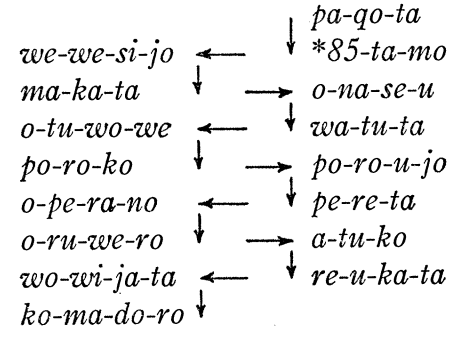
[1] Always omitting the names which do not appear in both and assuming the identity of *ma-ka-wo* : *ma-ka-ta, wa-ka-ta* : *wa-tu-ta, po-ru-e-ro* : *o-ru-we-ro.* On the first point, obviously extra names in either or both lists did not affect the relative order; the absolute order suggested by the numerals here is only for our convenience.

The way in which the relationship between the two orders is demonstrated by *boustrophedon* reading, even though Jn 725 at least could not have been written in this order, suggests that an original from which both derive might be constructed by assuming that it was read *boustrophedon* for one of the copies. Since the demands of Jn 658's order of writing are not nearly so strict as those of Jn 725 (because the columns may combine vertical with horizontal writing) the original list must be constructed on the basis of Jn 725's order and then tested on Jn 658. A little experimentation soon shows: 1) that the original list must have been of the columnar type, since paragraph-listing does not allow enough flexibility in reading to give two orders different only by so much; 2) that the Jn 725 order can not have been arrived at by a vertical or retrograde reading of the original since an original so constructed could not by any consistent reading give the order of Jn 658. More experimentation showed that the most probable archetype was as follows:

Archetype

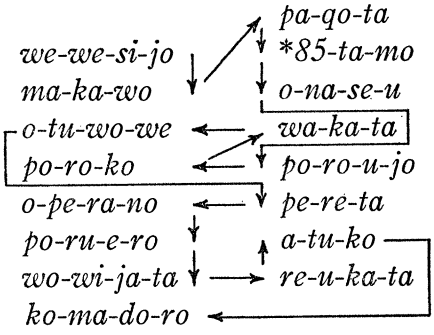
	pa-qo-ta
we-we-si-jo	**85-ta-mo*
ma-ka-ta	*o-na-se-u*
o-tu-wo-we	*wa-tu-ta*
po-ro-ko	*po-ro-u-jo*
o-pe-ra-no	*pe-re-ta*
o-ru-we-ro	*a-tu-ko*
wo-wi-ja-ta	*re-u-ka-ta*
ko-ma-do-ro	

Archetype as read for Jn 725 order

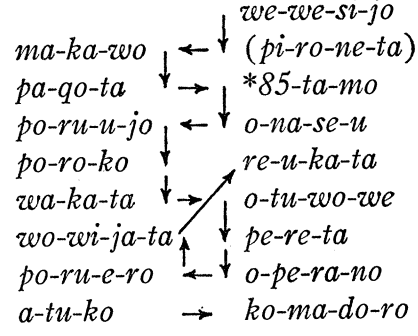


Simple *boustrophedon* order of reading of the two columns gives the names as they were written on Jn 725. One can almost see the scribe (or the man who was dictating to him) with a finger keeping his place as he zigzagged down this list and added names from other records as well. The reading order of this archetype which gives a possible writing order of Jn 658 may be shown thus:

Archetype as read for Jn 658 order



Order of writing on Jn 658



Reading of the archetype proceeds in an orderly fashion vertically in the left column for two lines, then across to bring the right column down to the same point; after *o-na-se-u* the expected next step would have been one or more names in the right column before going back to the left column, but the reader's finger must have slipped and skipped the line with *o-tu-wo-we* and *wa-ka-ta* so that *po-ro-u-jo* and *po-ro-ko* came next, and it was necessary to go back and pick up *wa-ka-ta* and *o-tu-wo-we*; starting again at *pe-re-ta,* crossing, and going down two names meant recrossing and having to backtrack to *a-tu-ko* and finish off with *ko-ma-do-ro.* This jerky and paranoiac reading must result from unresolved conflict between vertical and horizontal methods, while *boustrophedon* is an example of an even more satisfactory resolution of this conflict than the more modern but less efficient left-to-right movement in each successive line.

Writing order of Jn 658: the second column is started first at the end of the heading and continued with a second line,[2] but then the first column must also be started and continued with a second line; the pattern of two vertical steps followed by a horizontal slide (simply *boustrophedon*) continues through *po-ro-ko* where, either by inadvertence or through improvident hopes of increasing efficiency, the vertical steps were increased to three. On crossing over to the second column the writer missed a line and once more valiantly tried three vertical steps. Then crossing back to the first column he not only backtracked to fill the line which he had just missed but also the one previously missed in the second column. Finally the last two names were added on the last line.

Although by studying the order of the repeated names in Jn 725 and Jn 658 we have observed the variety possible in the direction of reading and writing, we are no nearer than before to a solution of the problem which tablet was written first. Fortunately, however, one other item of evidence is more useful for this purpose: of all the similar Jn records which list allocations of bronze, only Jn 658 and 706 are written by a different hand. Unless we are to imagine a dramatic situation in which, on the day before the destruction of the palace, a new scribe, was beginning to revise and rewrite all Jn records but succeeded in finishing only two, it is most likely that the record (Jn 725) which is in the same hand as all the others is the one that belongs to the official set and that the variant version (Jn 658) served another purpose. That is, if both Jn 658 and 725 were drawn up on the basis of an earlier list (last years's?), Jn 658 with its smaller number of smiths and larger allotments may have been an interim record made before the new information concerning the applicants or candidates for the current issue of bronze arrived. Based on a previous list, it served only, as it were, to reserve the *ca.* 80 M of bronze; that it was written before all the information was in is confirmed by the absence of names after the regular *to-so-de*

[2] In a columnar list where the direction of writing may shift as it may not in a paragraph-list, we must include the extra name (*pi-ro-ne-ta*).

a-ta-ra-si-jo formula of the second paragraph. Then when more information came from *e-ni-pa-te-we* with the names of several new candidates for bronze, the final list was recorded on Jn 725.[3] The peculiarities of even this final list show that *e-ni-pa-te-we* differed from other towns, perhaps enough to justify the oddity of an interim listing: Jn 725 alone of the Jn set gives no individual amounts, but only a total; Jn 725 alone of the set has no *a-ta-ra-si-jo* paragraph.[4] An explanation of these differences is attempted above in the text.

Jn 706, like Jn 658, is likely to be an interim record; both are by the other hand, both use *e-ko-si* rather than *e-ko-te* in the heading, and both have uniform individual allotments of 5 M. That Jn 706 does have names listed under the *to-so-de a-ta-ra-si-jo* formula suggests only that more information was available than for Jn 658. We must assume, however, that the final *pa-to-do-te* record is preserved not at all or only in unidentifiable fragment.

The difference of import between the *e-ko-te* of the final set and the *e-ko-si* of Jn 658 and 706 must be real, since the use of each is so consistent, but it is difficult to pin it down. Could it be that the participle is not attributive (" those who have ") but circumstantial (e.g., " when they have ") so that the difference between *e-ko-si* and *e-ko-te* could be translated as follows:

> the following smiths have *ta-ra-si-ja*; they get so much bronze
> the following smiths, when they have *ta-ra-si-ja*, get so much bronze.

If this was the difference, the *e-ko-si* would indicate that the list reflected a situation already in existence, one which might well have been used until new applications were complete enough to make the future assignment.

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[3] Lejeune's suggestion (*Historia*, X, 1961, p. 419 note 50) that Jn 658 is the final record seems to me difficult to reconcile with its being written in a different hand from the rest of the set. It also ignores the fact that Jn 658's unfulfilled *to-so-de a-ta-ra-si-jo* formula assumes a lack of complete information which is apparently remedied in Jn 725 with its greater number of names.

[4] The absence of the *a-ta-ra-si-jo* paragraph in the *a-ke-re-wa* part of Jn 693 is probably not significant because of the appearance of smiths from *a-ke-re-wa* on two other tablets: Jn 310, 725.