

THE CONSTRUCTION OF THE TABERNACLE.

INTRODUCTION.

EVERY thorough Biblical scholar, as well as every careful reader of the Bible, knows that the specifications given in Ex. xxvi. 1-30 relative to the construction of the Tabernacle, are regarded as insufficient to enable us to reconstruct it. Howbeit, that sacred structure and its service are extensively illustrated in Christian and Jewish literature, and learned men write and lecture about them. This is done according to various theories, traditional and modern, some of which are diametrically opposed to the plain words of the text. These have been indulged in from the time the Pentateuch was first translated into the Greek, some centuries before Christ, until the present day. And yet I affirm, and challenge the whole learned world to contradict me successfully, that the Hebrew text is perfectly plain, and that the specifications given in it are entirely sufficient to enable any practical master builder to reconstruct the Tabernacle at once, without the help of any theory or dictum of tradition. A perfect familiarity with the Hebrew language, with practical mathematics and geometry is all that is needed.

I have given side by side with the English of our common version a translation of the Greek version (LXX), and another of the Chaldean paraphrase, (Onkelos), the two oldest translations we have. I have added my own version in § 5 so that the reader may judge for himself according

to which version the reconstruction is or is not possible without violence to the Hebrew text.

I also hope that this scientific textual exposition, which the Lord has enabled me to give, will open a field of research for those Biblical scholars, who are not afraid of handling the numbers and measures of the Bible.

Indirectly it is demonstrated in this little work, that the words of our text may well be the words which it is claimed Moses received from Jehovah and communicated to the children of Israel in the desert of Sinai.

EXODUS XXVI.

ENG. COM. VERSION.

1. Moreover, thou shalt make the tabernacle *with* ten curtains of fine twined linen, and blue, and purple, and scarlet; with cherubims of cunning work shalt thou make them.

2. The length of one curtain *shall be* eight and twenty cubits, and the breadth of one curtain four cubits: and every one of the curtains shall have one measure.

3. The five curtains shall be coupled one to another, and *other* five curtains shall be coupled one to another.

4. And thou shalt make loops of blue upon the edge of the one curtain from the selvedge in the coupling; and likewise shalt thou make in the uttermost edge of *another* curtain, in the coupling of the second.

5. Fifty loops shalt thou make in the one curtain, and fifty loops shalt thou make in the edge of the curtain that *is* in the

SEPTUAGINT.

1. And the tent thou shalt make of ten draperies of spun linen thread, and hyacinth, and purple, and scarlet spun cherubim; in weaver's work thou shalt make them.

2. The length of the one drapery eight and twenty cubits, and the width four cubits shall each drapery be. The same measure shall there be for all the draperies.

3. But five draperies shall be held mutually one of another; the other of the other: and five draperies shall be held together each to the other.

4. And thou shalt make for them hyacinthian cups upon the border of the one drapery on one side, at the joining, and so shalt thou make upon the border of the outer drapery towards the second joining.

5. Fifty cups shalt thou make in the one drapery, and fifty cups shalt thou make at the side of the other drapery at the join-

TARGUM ONKELOS.

1. And the dwelling thou shalt make ten cloths of fine spun linen, and blue, and purple, and shining red, figures of cherubim, the work of a master shalt thou make them.

2. The length of the one cloth twenty and eight cubits, and the width four cubits of the one cloth. One measure for every cloth.

3. Five cloths shall be joining one with one, and five cloths joining one with one.

4. And thou shalt make loops of blue upon the border of the one cloth at the side of the joining, and so shalt thou make in the border of the second cloth on the side of the joining.

5. Fifty loops shalt thou make in the one cloth, and fifty loops thou shalt make in the side of the cloth of the second join-

ENG. COM. VERSION.

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TARGUM ONKELOS.

coupling of the second, that the loops may take hold one of another.

6. And thou shalt make fifty taches of gold, and couple the curtains together with the taches; and it shall be one tabernacle.

7. And thou shalt make curtains of goats' hair, to be a covering upon the tabernacle; eleven curtains shalt thou make.

8. The length of one curtain shall be thirty cubits, and the breadth of one curtain four cubits; and the eleven curtains shall be all of one measure.

9. And thou shalt couple five curtains by themselves, and six curtains by themselves, and shalt double the six curtains in the forefront of the tabernacle.

10. And thou shalt make fifty loops on the edge of the curtain that is outmost in the coupling, and fifty loops in the edge of the curtain which coupleth the second.

11. And thou shalt make fifty taches of brass, and put the taches into the loops, and couple the tent together, that it may be one.

12. And the remnant that remaineth of the curtains of the tent, the half curtain that remaineth, shall hang over the backside of the tabernacle.

ing; being face to face, reciprocally falling against each other.

6. And thou shalt make fifty golden clasps, and thou shalt fit together the draperies one to the other with the clasps. And it shall be the one tent.

7. And thou shalt make rough hairy cloths, a shelter upon the tent, eleven rough cloths shalt thou make them.

8. The length of the one rough cloth thirty cubits, and four cubits the width of the one rough cloth. The same measure shall be for the eleven rough cloths.

9. And thou shalt join the five rough cloths into a one by itself, and the six rough cloths into a one by itself. And thou shalt double upon itself the sixth rough cloth at the face of the tent.

10. And thou shalt make fifty cups in the border of the one rough cloth, the one in the middle at the joining, and fifty cups thou shalt make in the border of the rough cloth of the second joining.

11. And thou shalt make fifty copper clasps. And thou shalt join the clasps out of the cups, and thou shalt join the rough cloths, and it shall be one.

12. And thou shalt put down the surplus of the rough cloths of the tent; the half of the rough cloth that is loose below, thou shalt hide under the surplus of the rough cloths of the tent. Thou shalt hide behind the tent.

ing, the loops tending one to one.

6. And thou shalt make fifty clasps of gold, and shalt join the one cloth with the other by the clasps, and the dwelling shall be one.

7. And thou shalt make cloths out of goats for a spread upon the dwelling. Eleven cloths shalt thou make them.

8. The length of the one cloth thirty by the cubit, and the width four by the cubit of the one cloth. One measure for the eleven cloths.

9. And thou shalt join the five cloths by itself, and the six cloths by itself, and thou shalt double the sixth cloth towards the face of the dwelling.

10. And thou shalt make fifty loops upon the border of the cloth of the one joining, and fifty loops upon the border of the other joining.

11. And thou shalt make fifty copper clasps, and bring the clasps into the loops, and thou shalt join the dwelling, and it shall be one.

12. And the surplus that remains in the cloths of the dwelling, half of the remaining cloth shall be redundant on the back side of the dwelling.

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13. And a cubit on the one side, and a cubit on the other side, of that which remaineth in the length of the curtains of the tent, it shall hang over the sides of the tabernacle on this side and on that side to cover it.

14. And thou shalt make a covering for the tent of rams' skins dyed red, and a covering of badgers' skins.

15. And thou shalt make boards for the tabernacle of shittim wood standing up.

16. Ten cubit *shall be* the length of a board, and a cubit and a half *shall be* the breadth of one board.

17. Two tenons *shall there be* in one board, set in order one against another: thus shalt thou make for all the boards of the tabernacle.

18. And thou shalt make the boards for the tabernacle twenty boards on the south side, southward.

19. And thou shalt make forty sockets of silver under the twenty boards, two sockets under one board for his two tenons, and two sockets under another board for his two tenons.

20. And for the second side of the tabernacle on the north side *there shall be* twenty boards.

21. And their forty sockets *of* silver, two sockets under one board, and two sockets under another board.

13. A cubit from this, and a cubit from that, of the surplus of the rough cloths, from the length of the rough cloths of the tent, shall be a co-covering upon the sides of the tent from this and that side, that it may be covered.

14. And thou shalt make a reddened rams' leather covering for the tent, and a hyacinthian leather super-covering over above.

15. And thou shalt make styles of the tent from aseptic woods.

16. Ten cubits shalt thou make the one style, and one and a half cubits the width of the one style.

17. Two armlets to one style falling against each other. Thus shalt thou make to all the styles of the tent.

18. And thou shalt make styles for the tent, twenty styles on the incline which is towards the north.

19. And forty silver bases shalt thou make for the twenty styles, two bases for the one style for both of its sides, and two bases for the one style for both of its sides.

20. And the second incline, the one towards the south twenty styles.

21. And their forty silver bases; two bases for the one style for both of its sides, and two bases for the one style for both of its sides.

13. And the cubit from this side, and the cubit from that side in the surplus in the length of the cloths of the dwelling shall be redundant on the sides of the dwelling on this side and that to cover it.

14. And thou shalt make a cover for the dwelling, of reddened ram skins, and a cover of badger skins above that.

15. And thou shalt make the boards for the dwelling of uprightstanding shittim woods.

16. Ten cubits the length of the board, and a cubit and half a cubit the width of one board.

17. Two tenons connected one against the other. Thus shalt thou make for all the boards of the dwelling.

18. And thou shalt make the boards for the dwelling, twenty for the point of the south side.

19. And forty supports of silver shalt thou make beneath the twenty boards, two supports beneath one board for its two tenons, and two supports beneath one board for its two tenons.

20. And for the second side of the dwelling, to the north side, twenty boards.

21. And their forty silver supports, two supports beneath one board.

ENG. COM. VERSION.

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TARGUM ONKELOS.

22. And for the sides of the tabernacle westward thou shalt make six boards.

23. And two boards thou shalt make for the corners of the tabernacle in the two sides.

24. And they shall be coupled together beneath, and they shall be coupled together above the head of it unto one ring: thus shall it be for them both; they shall be for the two corners.

25. And they shall be eight boards, and their sockets of silver, sixteen sockets: two sockets under one board, and two sockets under another board.

26. And thou shalt make bars of shittim wood; five for the boards of the one side of the tabernacle.

27. And five bars for the boards of the other side of the tabernacle, and five bars for the side of the tabernacle, for the two sides westward.

28. And the middle bar in the midst of the boards shall reach from end to end.

29. And thou shalt overlay the boards with gold, and make their rings of gold, for places for the bars: and thou shalt overlay the bars with gold.

30. And thou shalt rear up the tabernacle according to the fashion thereof, which was showed thee in the mount.

22. And at the back of the tent, towards the side of the sea, thou shalt make six styles.

23. And two styles thou shalt make upon the angles of the tent at their back.

24. And it shall be out of the same line below, towards the same line they shall be from the heads into one clasp. Thus shalt thou make for both the two corners. Alike let them be.

25. And they shall be eight styles, and their silver bases sixteen. Two bases to the one style at both of its sides, and two bases to the one style.

26. And thou shalt make bolts of aseptic woods, five for the one style at the one side of the tent.

27. And five bolts for the one style, at the other one incline of the tent, and five bolts for the style at the back incline of the tent towards the sea.

28. And the middle bolt in the midst of the styles shall run through from the one incline to the other.

29. And the styles thou shalt over gild with gold. And the rings thou shalt make golden, in the which thou shalt put the bolts. And thou shalt over gild the bolts with gold.

30. And erect thou the tent after the pattern, which was shown thee in the mount.

22. And at the extremities of the dwelling westward, thou shalt make six boards.

23. And two boards thou shalt make for the corners of the dwelling at their extremities.

24. And they shall be tending below, and unto one they shall be tending at the head into one link, thus shall it be for the two, for the two corners shall they be.

25. And they shall be eight boards, and their silver supports sixteen, two supports beneath one board, and two supports beneath one board.

26. And thou shalt make bars of shittim woods, five for the one side of the dwelling.

27. And five bars for the boards of the second side of the dwelling and five bars for the boards of the side of the dwelling at their extremities westward.

28. And the middle bar inside the boards, barring from extremity to extremity.

29. And the boards thou shalt cover with gold, and their links thou shalt make of gold; a place for the bars; and thou shalt cover the bars with gold.

30. And raise thou the dwelling according to its rule which thou wert shown in the mount.

I shall first consider the difficulties which the three foregoing translations present to the Hebrew scholar and the practical builder; then the textual and practical difficulties which traditional and modern theories present to the same. Finally I shall show in the last section that a rigid adherence to the original text and the application of sound common sense remove all the difficulties.

DIFFICULTIES OF THE ENGLISH COMMON VERSION.

I shall not advert in this place to the "loops" and the "selvedge" (verse 4) of the Common Version, leaving these for the last section.

The *first* difficulty we meet with is in verse 12. "The remnant that remaineth," is an improper translation of V'SeRaHH HoGHouDaiF¹. The word S'eRaHH in Ezek. xvii. 6, means "trailing," spoken of a vine, and translated by the Common Version "spreading," which is perfectly appropriate in the verse before us also. It should therefore be translated, "the spreading that remaineth."²

Next is the expression "the half-curtain that remaineth." What half-curtain is this? We recollect that the goat's-hair curtains were eleven, that five of them were joined together, and the six others also together, then that the sixth curtain of these six was doubled. And as the single curtain was four cubits wide, the whole $10\frac{1}{2}$ curtains would give us $10\frac{1}{2} \times 4 = 42$ cubits. Now the length of the Tabernacle was 30 cubits (see verse 18), and the height of a board was 10 cubits, and this is taken by the Common Version to have been the height of the Tabernacle, so consequently we would have 42 cubits to cover a length of 40 cubits, and two cubits would, therefore, be remaining over.

¹ וְסֵרָחַח הֹוּדַיִף. For an explanation of the system of transcription see the introductory table to the author's "The Mosaic Names of God," *The Monist*, XVII, 390

² See Midrash Rabbah Leviticus, Parsha 5 on the word סֵרָחַח.

Now the text reads (verse 12): "And the spreading that remaineth of the curtains [notice the plural!], the half of the curtain [notice the singular!] that remaineth, shall hang over the back-side of the Tabernacle." Half, therefore, of half the width of a curtain of four cubits width is one cubit; but what is to be done with the other half of the curtain's width the text does not seem to state. The English Common Version avoids the difficulty by translating "the half-curtain," leaving out the little word "of," which, however, it has no more right to do here than to leave out the same word in the first clause of the verse, and translate it here: "And the spreading that remaineth—the curtains," which would give no sense. But the translators of the Common Version did not know that the length of the ceiling was longer by 1.0606+ cubits than the floor of the Tabernacle (as we shall see in the last section) and hence allowed themselves to do violence to the text in order to make out some sense for themselves. This difficulty will not for the present strike the reader as so very great, as it will when he has learned all other difficulties, and their simple solution; for the truth is that the uses and measurements of the soft coverings can not be well understood without a correct knowledge of the framework of the Tabernacle.

The *second* difficulty, which presents itself in the specification, is in verse 16. It says how long and how broad each board must be, but it does not say how thick the boards were. Suppose they were two-inch planks and a very serious difficulty occurs. The frame-work was to have three walls only, was therefore open at the front (see verses 18-22). The long walls would be 30×10 cubits. Taking a cubit to be even 20 inches, this would give us a wall 50 feet long and 16 feet 8 inches high,⁸ made of 2-inch planks held fast to only one back wall 15 feet long

⁸ 600×200 ", or the cubit at 25", then 750×250 ".

and 16 feet 8 inches high (9×10 cubits),⁴ and made of the same 2-inch planks. This would give a very precarious frame-work which must cave in at its free ends. Nor can we rely on the sockets mentioned in the specification, for they weighed only a talent each of silver (see Ex. xxxviii. 27), being $93\frac{3}{4}$ pounds, and even though there were two sockets for each board, this amount of metal would not be a sufficient base to secure a board of 16 feet 8 inches high and $2\frac{1}{2}$ feet broad to stand upright against the gust of a desert wind. Nor could the bars that held the boards together help much, for there was only one such bar that was appointed to do this, viz., the one that locked from end to end (see verse 28).

I do not speak for the present of the wrong translations, "tenons" and "set in order one against each other." We shall come to these afterwards. It is sufficient for the present to consider the precariousness of such a frame-work, especially for the desert. It must also be noted that the specifications do not seem to rely much upon the usual stakes and ropes of a tent, for there is no mention of them here, and only a passing mention in one place elsewhere, viz., Ex. xxxv. 18. But perhaps even this difficulty will not appear to the reader as very great.

The *third* difficulty presents itself in verses 23-24. After we think of the three walls erected and the two corners well coapted, we read of two additional boards ordered "for the corners of the Tabernacle in the two sides." Of what use are they there? And how are they to be held there? Now we must recollect that the specification in verse 17 says that *all* the boards of the Tabernacle must be alike, and these two in the corners can, therefore, be no exception. Furthermore, the original word for the "corners" here, $M'Q^{oo}TSGH^{ou}TH$,⁵ means really "cut-

⁴ The cubit at 20" gives 180×200 ", or the cubit at 25" gives 225×250 ".

⁵ מקצעת

outs," or "cut-offs," and how can two boards meeting at right angles present a cut-out or cut-off corner? And further, each one of these boards is ordered, according to this Common Version, to be "coupled together beneath, and coupled together above the head of it into one ring." Whereto is this board to be coupled? The text does not say. Coupled to itself, gives no human sense. And are these corner boards after all to be different from the rest? The text does not say so, allowing an exception from the general specification in verse 17, where it says, that *all* the boards must be alike. Or was this the construction of all the boards? Then what was it? Moreover it says in verse 25 that these two corner boards, together with the six of the west wall, are to make up eight boards, and the language implies that these eight boards were to be alike.

I think the reader will here admit that he is "cornered," and that there is no escaping from the difficulty into which the Common Version has brought us. But the difficulties are only in a version and not in the original text, as we shall see.

The *fourth* difficulty is in verse 28 which is rendered, "And the middle bar in the midst of the boards shall reach from end to end." The original words rendered here "middle in the midst," are H^aTTⁱIKh^{ou}N B'TV^{ou}Kh^o and mean, "the inside one inside." What "inside" then is meant? Shall we think that one bar ran through the thickness of the two-inch planks? That would certainly be of no account for strengthening the walls. Or does it mean the fifth bar between the other two above and below it? Then it ought to have said H^aTTⁱIKhV^{ou}N BaiⁱN H^aBBRⁱIHHⁱIM,⁷ "the middle one between the *bars*," and not "the inside one inside of the *boards*." Moreover, why only one bar to "reach from end to end"? Were it not better to have all the five bars do the same and give the

⁶ החיכין פתוך

⁷ החיכין בין הפרחים

very necessary firmness to these precariously thin and lofty walls? Or, were these four "bars" only to hold the "boards" together, and the important corners to be left with only *one* bar to bear all the strain? This would be too unworkmanlike!

Such are the difficulties of the Common Version. It follows the Latin Vulgate in this instance, which renders the original Hebrew Q^eR^eSh with *tabula*. This translation is followed by the versions of all Roman Catholic nations and by all versions that have sprung from the Vulgate: so Luther; the Zürich Synod version; the version by De Wette, 1839; so also *Die Bibel für die Katholiken* von Heinrich Joachim Jack, Bamberg, 1845. All have *Brett* for Q^eR^eSh. The English Common Version has "board"; the Polish version of the British and Foreign Bible Society has *deska*; the Bohemian version of Prague, 1867, has *dska*; the Spanish version, London, 1855, *tabla*; the French version by David Martin, Paris 1845, has *ais*. The Russian versions alone, both by the Holy Synod, St. Petersburg 1878, and by the British Bible Society, printed at Vienna, 1878, have for Q^eR^eSh *broos*, which means a "beam" or a "four-square beam"; thus they evidently understand the *stylos* of the LXX. This does not decide, however, the question of the identity of the Greek *stylos* and the Latin *stilus*, which means a body formed with a base and running up to a point. The figurative use of *stylos* as "supporting pillar in the church" would also not militate against the idea of a *pointed* pillar in the Tabernacle, for here the *stylos* did support the coverings of it. But in this linguistic question I will not enter here.

THE SEPTUAGINT'S IDEA AND ITS DIFFICULTIES.

This version differs in some very important points from our Common Version, but presents also some insuperable difficulties.

In verse 4 it renders the original L^{oo}L^oA^{ou}Th¹ with *angkulas*² which means "cups." This translation is far preferable to the Common Version's "loops," not only on linguistic grounds (of which more in the last section) but also on those of structural intention, for these "loops," or "cups" with the "taches," or "clasps" were evidently intended for a nice coaptation of the two large spreads, each 20×28 cubits (at 20 inches = 33' 4" × 46' 8", or the cubit at 25", = 41' 8" × 58' 4", or in inches, either 400" × 500" or 500" × 700"), and for this purpose loops *and* taches were far less suitable than "clasps" going through the edge of the cloth itself. And when they say that these "cups" were to be "hyacinthian," it means that these were to be worked out with hyacinthian thread.

The *first* difficulty we meet with in this version is the same one we met in the Common Version. It is in the 12th verse. The translators deviate most strangely from the original text, and yet even then make no sense as they themselves admit, and as the reader will see from my translation of this translation, which I have endeavored to make as accurate as possible. They evidently had no better idea of the true length of the ceiling of the Tabernacle than the translators of our Common Version, hence their obscurity and violation of the text. This want of knowledge is less excusable in them because, as we shall see immediately, they had a more correct idea of the walls than those who imagined them to have been straight up and down.

The *second* difficulty we meet with in this version, is in verses 15, 16, and 17. The original word Q^eR^eSh,³ which our Common Version renders "board," is here rendered *stylos*⁴ which means "pillar," We would have, therefore, a pillar 10 cubits long, or high. (it does not say which), and 1½ cubits wide. But how thick was it? This

¹ תִּאֲזָזִים² ἀγκύλας³ שֵׁשֶׁבֶט⁴ στύλος

neither the original text nor this version says. But assuming that the width specified means either way, then we would have a pillar of $10 \times 1\frac{1}{2} \times 1\frac{1}{2}$ cubits. Then at 20" the cubit, it will give us $30'' \times 30'' \times 200'' = 180,000''$ cubic contents; and allowing 2 cubic inches to the ounce would give us $180,000 \div 2 = 90,000$ ounces, or 5625 pounds; too enormous a weight for carriage by hand or cart. But in verse 17 the original word $\text{I}^{\circ}\text{D}'\text{V}^{\text{ou}}\text{Th}$,⁵ which our Common Version renders "tenons," is rendered here *angkōniskoi*,⁶ a diminutive of *angkōn*,⁷ meaning "the arm" and also "the bend of the arm," "the elbow." And since in the Alexandrian Greek we regard the diminutive particle as used in the sense of our "like," we may translate that Greek word, "arm-bend-like," and understand that that "style" or "pillar" had two arm-bend-like planes, which on a longitudinal section across the planes would give us a triangle of two equal sides of 10 cubits long, and a base line of $1\frac{1}{2}$ cubits. This of course would reduce the weight of the "style" or "pillar" by just one-half, and make it $2812\frac{1}{2}$ pounds, but still too heavy for carriage by hand or cart, especially in a desert without roads.

The reader will admit the *weight* of this difficulty, and yet he will see by and by that this idea of the Septuagint contains a very important truth. Moreover that its translators had the idea that the walls of the Tabernacle were not upright but inclining, is evident from verses 18, 20, and 27, where they reverse the order, and in speaking of the south side they call it the incline toward the north, and of the north side they say, the incline toward the south, and of the west wall the incline toward the west, i. e., looking from the inside at the westwardly inclining plane of the west wall. These two sides, or arms of the "style," the Septuagint describes as "falling against each other,"⁸ and this is the correct translation of the original

⁵ יָדוֹת⁶ ἀγκωνίσκοι⁷ ἀγκών⁸ ἀντιπλήττοντας ἕτερον τῷ ἑτέρῳ

M'Sh^{oo}L^oBh^{ou}Th A^eSh^oH A^eL A^aHH^{ou}Th^oH,⁹ which our Common Version in verse 17 renders "set in order one against another." In this connection I must mention Bähr's strange misreading of this word as *anapiptontes*,¹⁰ giving thus the very opposite idea, viz., "falling away from each other," from the Septuagint text. See his *Symbolik des Mosaischen Cultus*, 1837, Vol. I, p. 59. He may have had an edition of the Septuagint with such a reading, mine is that of L. Van Ess, Leipsic, 1835.

The *third* difficulty we meet with in this version is in verses 23-24 relating to the corners. In each one of those two corners, which according to this version were only

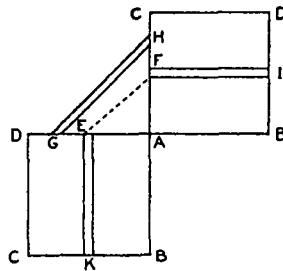


Fig. 1.

closed at the point on the ground but open above, there would have to be fitted one "style" of the same dimensions as the rest, which is impossible, as the figure shows. Let A B C D represent the two square bases of the pillars, which meet at the right angle A, and whose ridges are F I and E K. Then the requirement is, that between E and F should fit in the ridge of another style, viz., the line F I or E K, which is impossible, for $EA = FA = \frac{1}{2}$ base line, and these are the two sides of a rectangular triangle whose hypotenuse is $EF < 2AF$; but $2AF = FI = EK$, and could not get in to fill out the corner, but would be stopped about the points G H. The reader will notice that the practical difficulty is to know what the other line of the base is, for the text gives only

⁹ משקנת אשה אל אחיה

¹⁰ ἀναπίπτουτες

the one of $1\frac{1}{2}$ cubits, but says nothing of the other, and we have seen it cannot possibly be $1\frac{1}{2}$ cubits on account of weight. How long is it then?

Further, it says in verse 24, "And it [a very strange singular! Perhaps a mistake of *estai* for *esontai*¹¹], shall be out of the same line (*ex isou*¹²) below, towards the same line they shall be (*kata to esontai isoi*¹³) from the heads into one clasp." If then the "style" was a solid timber, what does it mean: "out of the same line below," and "toward the same line above"? Should this line refer to the perpendicular height of the style? But this line is not given, for that other line of the base, or the thickness of the style at the base, is not given, from which we might possibly ascertain that height by construction or otherwise. Then again what is the use of that clasp at the heads? Does it refer to the joining of two styles together at the top? But it speaks all along of only one style.

Then again the question recurs, are the corner styles different in their dimensions and structure from the rest? But this would be against the specification in verse 17. Let the reader read this difficulty over again, and he will see that it is insuperable.

The *fourth* difficulty is again in verse 28. How shall the middle bolt be made to run through the twenty styles on the south and the north, and the six styles, or perhaps the eight styles on the west side? This part of the specification is not less unsatisfactory than the rest.

And yet the specifications are very plain, and the writers of the Septuagint came very near understanding it.

ONKELOS'S IDEA AND ITS DIFFICULTIES.

These are essentially the same as those presented in our Common Version, the difference being only this, that Onkelos adhered more closely to the original text, which

¹¹ *estai for esontai*

¹² *ἐξ ἰσου*

¹³ *κατὰ τὸ ἐσονται ἰσοῦ*

he could do as he wrote in a cognate dialect, merely transcribing certain difficult words. The differences are the following:

In verse 12 he says, "half of the remaining cloth," and not as our Common Version, which leaves out the "of."

The word S^eR^aHH¹ rendered in our Common Version "remnant," he merely transcribes Chaldaically SⁱRHH^oA.²

In verse 17 he merely transcribes the original M^oSh^{oo}-L^oBh^{ou}Th³ Chaldaically M^oSh^aLBhⁱIN⁴

In verse 24 he renders the importantly differing two words T^{ou}A^aMⁱIM⁵ and T^aMⁱIM⁶ with one and the same word M^oKh^aVNⁱIN⁷ = "tending," just as our Common Version does with "coupled."

In verse 28 he renders B^oTV^{ou}Kh⁸ by B^oGaiV⁹ = "inside," and not as our Common Version does, "in the midst."

In all other points our Common Version is a perfect counterpart of Onkelos's evasive paraphrase.

TRADITIONAL AND MODERN THEORIES AND THEIR DIFFICULTIES.

The ancient Jewish sources on the structure of the Tabernacle are (1) the B^aR^{ai}I^ITh^a DⁱML^{ae}Kh^eTh H^aM-MⁱShK^aN,¹ which means "The Extra-Mishnaic Treatise on the Work of the Tabernacle." There are three editions of this work (a) Venice 1602; (b) Hamburg 1782, which occurs at the end of a treatise on oaths, containing also "A New Version of the Midrash Rabba on the Blessing of Jacob on his Sons," by Rabbi Hai Gaon. Of this edition I have only the first leaf of the fascicle of the treatise on the Tabernacle treating of the frame-work and coverings, and of the court. The most valuable edition (c) is

¹ סִבְחָה
² סִיְהָא

³ מְשֻׁלָּה
⁴ מְשֻׁלָּיִן
⁵ הָאָמִים
⁶ הַמִּים
⁷ מְבֻוֹנִין
⁸ כְּתִיף
⁹ בְּנָה

¹ כְּרִיחַת רְמִיאַת הַמֶּשֶׁבַּח

that by Heinrich Flesch as his inaugural thesis for the Doctor degree before the Philosophical Faculty of Zürich, June 18, 1892 (*Die Barajtha von der Herstellung der Stiftshütte nach der Münchener Handschrift*). The manuscript from which this Flesch edition was made is Cod. 95, perhaps the most valuable one of the great Munich Talmud manuscripts, and was written in 1342. Dr. Flesch's dissertation leaves nothing to be desired so far as this manuscript is concerned, but as a key to the construction of the Tabernacle according to the specifications in the Pentateuch it is unsatisfactory.

The time when this Baraitha was written Dr. Flesch thinks may be safely set as the third century A. D. What I did not find in Dr. Flesch's comments on the text of this treatise I stumbled upon later, viz., (2) Mishna 3 of *Tract. Shabath*, Chapter 12, and both the Babylon and the Jerusalem *G'marouth* to it, which I shall give fully in my translation of and comments on verses 24-25 (pp. 602 f.).

(1) The difficulties which occur now to us in an attempt to reconstruct the Tabernacle, occurred also to the ancient Rabbis, and yet they had no more to go by than we have now, viz., the *apparently* obscure specifications in the original text. Hence they theorized. The first difficulty that presented itself was the number given for the Q^eR^oShiIM (translated "boards," "beams," "styles") in the west wall, and for the two corners there, viz., six and two, and which it is specified are to be counted together as eight. These would, therefore, give 12 cubits width to the Tabernacle. But then the pieces of the second covering were only 30 cubits long, ten of which would be required for each wall south and north, leaving, therefore, 10 cubits for the ceiling's width. This measure of the width appeared to them as imperative, since the Temple of Solomon was 20 cubits wide, (1 Kings vi. 2), so this Tabernacle must be just half as wide, and the 30 cubits' length of the

second cover would just fit it. The two corner boards would then give only half a cubit sticking out at each end. But there are specified two sockets for each Q^eR^eSh, which evidently indicated it to be thicker than a mere plank. How thick then? The text does not say, for it only speaks of the length and width. They theorized *one* cubit. Then they theorized further, that the sockets were one cubit high, into which two tenons, one cubit in length were cut out from a Q^eR^eSh and fitted in, so that nine cubits of a Q^eR^eSh were left above the two sockets, and this diminution of one cubit in the length (height) of the wall was again found in its thickness, and the 30 cubits length of the second cover would then reach from above the sockets to the same point on the opposite wall. But the weight of such a beam, (10 × 1½ × 1 cubits) presented an evident difficulty. So another traditional party theorizes (from that remnant of a tradition, which we still see in the Septuagint translation) that the beams were only 1 × 1½ cubits at their base but tapered off on two sides to one fingers' thickness at the opposite end. This would diminish the weight of a Q^eR^eSh by nearly one-half. The length then across the frame-work would be 1 cubit for the socket, 9 cubits for the Q^eR^eSh, ½ cubit for the space of the slanted off thickness at the top, 10 cubits for the width across (as on the ground), then again ½, 9, and 1 on the other side, hence 1 + 9 + ½ + 10 + ½ + 9 + 1 = 31. These two half cubits, which the squared or slanted off beams would add to the width of the ceiling, this second traditional party does not account for, for they say, (*Babyl. Talmud*, tract Sabbath, fol. 98, b) that according to the slanting theory, the first cover of 28 cubits length would reach from above the socket to above the socket across, and the second cover, of 30 cubits length, would reach from below the socket to below the socket across. But a more serious difficulty for this slanting traditional theory presented itself in the two

corners, for the receding slopes of the walls south and north and west, upwards and outwards from within, would necessarily leave at the corners an open triangular space. This difficulty is answered by saying that the corner beams were differently shaped from the rest.

We see, therefore, that this traditional party violates the clear specification of the text in verse 17, where it is said that *all* the Q^eR^oShⁱIM of the Tabernacle must be alike in shape and measure. Nor does it meet the physical difficulty of the weight of a Q^eR^eSh which according to it too would have been 3750 pounds, viz. $(10 \times 1\frac{1}{2} \times 1) \div 2$ cubits, the cubit taken even at 20" and allowing two cubic inches to the ounce.

As to the inside bar spoken of in verse 28, the traditionists say that it ran and kept itself there by miraculous interposition. And the French Rabbi Solomon Itshhaki³ of the twelfth century A. D. is even willing to believe that that bar ran around the right angle at the west wall and into its beams, of course miraculously.

As to the widths of the two coverings applied to the length of the Tabernacle the traditional theories are these. The slanting theorizers give the remnant spoken of in verse 12 as a trail at the back of the Tabernacle, and for this they had to spare at least $1\frac{1}{2}$ cubits from the second covering of 42 cubits width. But those who theorized the beam to be one cubit thick say that the word "trail" in verse 12 means simply to trail beyond the first covering. But even these last theorizers would also have one cubit of the 42 to spare; they are not clear in their theory, and we may be led to think with Rabbi Itshhaki that they allowed a certain portion of the second covering to hang over the front of the Tabernacle on and over its five pillars (see verse 37). A homiletic traditional touch appears in the

³ Commonly and erroneously called and quoted as Yarhhi, but better known as "R(a)shi," from the notaricon or initial letters of his true name. See his commentaries to the place in tract *Shabbath*, and to *Ex. xxvi*.

conundrum, Why is the Tabernacle like unto a woman? because it has a trail behind itself like a woman who goes in the street; and like her the same French rabbi thinks, the Tabernacle must have had a sort of a veil in front of its face.

These rabbinical, traditional theories, physically impossible and textually inconsistent as they are, are followed nevertheless by many writers, particularly the older ones. It is on this account that I have stated them fully.

(2) To Josephus's account of the Tabernacle I do not think it worth while to refer. That peculiar man (despite the praise he receives) a mixture of patriot and traitor, priest and worldling, scribe, Pharisee, Sadducee and Greek literateur, did not seem to have had the least idea that he would be criticised in what he wrote by any one who knew the original O. T. Scriptures, and so he went on *ad libitum*, spinning out ideas, frequently contradictory, merely as it seems to swell the volume of his books and for the possible amusement of his Roman masters who might chance to cast a glance into them, be astonished, and then give praise to their noble *protegé* from *Judea Capta*.

(3) Of modern writers, Dr. K. C. W. F. Bähr, must be mentioned first. In Vol. I of his *Symbolik des Mosaischen Cultus* (1837), § 1, he treats the subject *in extenso*. He sees, indeed, both the textual and physical difficulties, but is satisfied to adjust them more or less in accordance with the above Jewish traditional theories, which have great and almost ultimate authority with him. However, he evidently did not read these traditions in their first sources, but made his acquaintance with them at second hand, chiefly from Rabbi Itshhaki's commentaries, and from other modern Jews. Had he read those traditions in their sources, he could not then have failed to discover that the ancient rabbis were by no means a unit on the subject, as that French modern rabbi made him believe and

as even the Septuagint might have taught him had he not so strangely neglected that earliest written source of Jewish traditions.

(4) A more recent writer on this subject is Dr. August Knobel in his commentary on Exodus and Leviticus in the *Kurzgef. exeg. Handbuch d. A. T.*, Leipsic, 1857, pp. 272-273. The word Q^eR^eSh,³ in verse 15 and following, he derives from a non-existing verb Q^oR^{ou}Sh⁴ and identifies it with Q^oR^{ou}TS⁵ which he translates "to cut off," "to cut in pieces," and so he gets his meaning "board" for our Q^eR^eSh. But in the six places where this word occurs in the Hebrew and Chaldee of the Old Testament⁶ the word cannot be made to mean anything else but "to dig out," and "to protrude." Yet the author refers to the Q^eR^eSh in Ezek. xxvii. 6 in corroboration of his rendering "board." But that very place in verse 7 should have shown him the impossibility of his rendering, for there it would make a banner spread to the winds on a board!

In verse 17, too, he translates I^oDV^{ou}TH⁷ "tenons," and M'Sh^{oo}L^oV^{ou}Th⁸ "held together by a strip." For this last word he refers to 1 Kings vii. 28, the only other place it is found in the Old Testament. But the first word never means tenon, and the translation of the second does not suit at all in the place referred to.

MiQ^{TS}^{ou}GH^{a9} in verses 24-25 he also translates "corners," and derives this noun from the verb Q^oTS^{ou}GH^{a10} which he translates, "to cut off," "to cut in," and hence the derived noun means, "corner." But the noun thus derived can never mean a corner, for this is always a finished end, and not an end cut "off" or "in." The author refers to Ezek. xlvi. 21 f., but this very place should have

קָרַשׁ קָרַשׁ קָרַץ

⁶ Job xxxiii. 6, Ps. xxxv. 19, Prov. vi. 13, x. 10, xvi. 30, Jer. xxxvi. 20, and Dan. iii. 8, vi. 25.

קָרַח קָשְׁלָכָה מִקְצָע קָצַע

taught him that the word cannot mean a simple "corner," for how could it be said there that a person was made to pass *through* a closed-up corner?

The corner boards, he theorizes to have been composed each of two boards, one of them half a cubit wide, to give the additional cubit to the nine of the west wall, (the author accepting the traditional 10 cubits in width), and the other limb of one cubit width which lapped over the long wall.¹¹ He then translates verse 24 thus: "And they shall be double from below on, *and at the same time*,¹² they shall be whole (every one) until its head, until the *first*¹³ ring." But aside from other cogent objections to this translation and theory, they are more than sufficiently refuted by the two Hebrew words given in footnotes 12 and 13 as irrefutable witnesses against the author. That this theory makes the corner boards totally different from the rest, and hence in contradiction to the definite specification in verse 17, has of course no weight with such decided rationalists as Drs. Winer and Knobel.

The word M^aBhRiI^aHH,¹⁴ in verse 28, the author renders "letting pass through." But it can mean nothing else than "bolting" or "barring." And B'TV^{ou}Kh¹⁵ in the same verse he renders, "between," i. e., as he says, between the two upper and lower bars *on* the boards. But this is no Hebrew language or diction at all!

One had a right to expect better things from such an Hebraist as Dr. Knobel, but it seems that even rationalism does not shield a learned man against the warping influences of traditionalism, and its disregard for the sacredness of the text prevents him too from seeking and finding the simple truth.

¹¹ This theory has been previously proposed by Winer in his *Bibl. Realwörterbuch*, vol. II, p. 529, note 3.

¹² וְהָיָה כִּי יִבְנוּ

¹³ אֶת

¹⁴ מְקָרִים

¹⁵ בְּתוֹךְ

(5) The next recent author I will mention is Rev. T. O. Paine, a minister of the New Jerusalem Church. He treats of the Tabernacle in his work entitled *Solomon's Temple, or etc.*¹⁶ which is superbly and beautifully illustrated. I am at a loss what to say about the author's altogether new theories with regard to the Tabernacle. Space and time forbid entering into details. Yet I would have done so, had the author impressed me with the idea that he understood the Hebrew language thoroughly, which he decidedly did not. All I can say is that the author's imagination worked here boldly and systematically, but he removed no textual difficulty and built upon the translation of our common English version, as though it were the original sacred text itself. But he went beyond it, and put a gable roof on the Tabernacle of his imagination because it suited him. And the text stands pure, clear, and simple, though violated by friend and foe.

(6) The next author I will mention is the well and widely known orthodox divine and commentator, Dr. C. F. Keil. His ideas on the subject I find in his commentary on Exodus.¹⁷ He too accepts the rendering of Q^eR^eSh by "board." But instead of "tenons" he translates I-DouTh¹⁸ in verse 17 "pegs," and M'Sh^{oo}L^oBh^{ou}Th¹⁹ "bound to one another." He says: "The pegs were joined together by a fastening dovetailed *into* the pegs by which they were fastened still more firmly to the boards, and therefore had greater holding power than if each one had been simply sunk into the edge of the board." And these two pegs were placed into one socket each. How high these pegs were to go up on the boards, how long, broad, thick, and how far their socket ends were to stand from

¹⁶ Published by George Phinney, 21 Bromfield St., Boston, 1861.

¹⁷ Translated by the Rev. James Martin, B. A., Nottingham, and published in Edinburgh by T. and T. Clark, 1866, pp. 178-180.

¹⁸ קרית

¹⁹ משקניח

each other, the text does not say a word. Yet as a new theory it is refreshing, and might be accepted as a last resort, if the text had not a far plainer meaning and idea, as we shall soon see. The corners and the corner boards he conceives of as do Winer and Knobel, and refers also to Ezek. xlvi. 21-22, as absurdly as Dr. Knobel. He differs only in that he does not translate the word V'I^aHHD^oIV²⁰ at all, and renders "with regard to one ring," what Dr. Knobel translates "until the first ring." Dr. Keil finds the meaning of these words very obscure in some points," but is satisfied with the Winer-Knobel idea about it, together with his new idea, that the ring mentioned here "was placed half way up the upright beam in the corner or angle, in such a manner that the central bolt, which stretched along the entire length of the walls (verse 28), might fasten into it from both the side and the back." But this verily is adding to the essential text, for rings are provided for the bolts specifically enough in verse 29. Nor can Dr. Keil escape the fact that he too makes these corner boards specifically different from the rest, and therefore in contradiction to the clear specifications in verse 17, that *all* boards (Q^eR^aShⁱIM) of the Tabernacle must be alike.

(7) The next author I will mention is Mr. James Fergusson, F. R. S., F. R. A. S., Fellow of the Royal Institute of British Architects. His ideas about the Tabernacle are given in Smith's *Dictionary of the Bible*, Vol. III, pp. 1450-1454, article "Temple." He too accepts the idea of boards 10 cubits in width, made up by the two corner boards, added to the six of the west wall, and seems not at all troubled either about the tenons or about those peculiar corners and their boards. What Mr. Fergusson is troubled about is that the Tabernacle should have no roof to shed the rain. He therefore *assumes* that there was one of such a con-

struction as seen in the subjoined Fig. 2, which gives a transverse section of the frame-work and first covering of the Tabernacle. But the reader will ask, what supported this gable roof? Mr. Fergusson answers that there *must* have been a fifteen cubit pillar in the front of the Tabernacle, and a similar one at its rear, and across these a rope was drawn as a ridge pole. But even this is not enough for him, since he still fears that the rope and the curtain upon it will droop, so he *thinks* that another fifteen cubit pole was provided for inside the Tabernacle. By referring to Rev. T. O. Paine's ideas (see above page 588), it will be seen that Mr. Fergusson had been preceded in the gable-

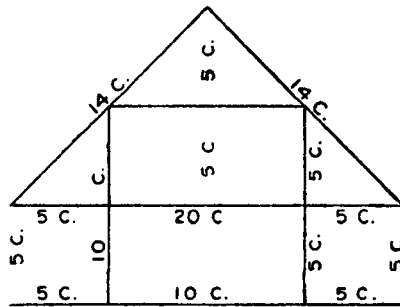


Fig. 2.

roof idea. That there is no mention whatever of these pillars and rope-ridge in the text does not seem to have disturbed their imaginations. It will also be seen that it is essential for the proportions according to Mr. Fergusson's theory that the width of the Tabernacle should be 10 cubits, for there everything is divided by 5. But the text says (verse 22) that the back wall was to be only 9 cubits, or if the two corner boards were incorporated in the length of that wall, then 12 cubits. Mr. Fergusson does not mind it, and relies on Josephus and tradition. But what is he going to do with those spaces on either side and under the eaves of the Tabernacle? He builds nice and convenient cells there, as it to be seen beautifully drawn in his picture on

page 1454. He finds his authority for this third department, which he calls the porch around the three sides, in Josephus (*Ant.* III, 6, 4) who says that the Tabernacle was divided into three parts, though he specifies only two—the *adytum* and the *pronoas*. “The third,” exclaims Mr. Fergusson, “was of course the porch, 5 cubits deep, which stretched across the width of the house.” But why does not Josephus mention this third department? Why, because he speaks only of three parts, each 10 cubits long, one of which was taken up by the *adytum* (Holy of Holies), and the two parts, 2×10 cubits, was occupied by the *pronoas* (holy). The Hebrew points which Mr. Fergusson makes I had better pass uncriticised. There are clear and minute specifications given in the scriptures, precluding any necessity of the liberty of fancy and imagination as we shall see.

(8) Another authority is *Die Stiftshütte in Bild und Wort gezeichnet von Wilhelm Neumann, mit 79 in den Text gedruckten Abbildungen und 5 Tafeln in Buntdruck*, Gotha, 1861. This includes the entire structure and ritual of the Tabernacle and the encampment of Israel in the desert. The author is a Hebrew scholar. He refers to no translation and traditional authorities and professes an orthodox Christian faith. He contends against interpreting the record of an Oriental sanctuary by Occidental notions. He is familiar with Beduin tent construction (p. 16) and thinks this should guide us in the interpretation of the Tabernacle structure. He gives a picture of two desert tents, a round one and a square one, to guide us, (pp. 56-57). Ten rules (*Normen*) guided him in the present work and the first of these is as follows: (1) Not all things that are necessary for the construction are named in the Law (specifications, I would say) and not everywhere is the manner of that which is named exactly defined

and sufficiently apportioned (*bemessen*), as the purpose of that which is named would demand.

Space and my time and that of the reader do not permit a translation of all the rest of the nine rules that guided the author. I must limit myself to some of the crucial points in the Hebrew text.

(a) By Q^eR^eSh he understands a thick plank (*Bohle*), in this case here 1½ ells thick, upright square from bottom to top.

(b) By I^oD^{ou}H (Ex. xxvi. 17) Com. Vers. "tenons," he understands two tenons at the bottom of a Q^eR^eSh which are connected with each other and fit into silver bases. He comes to this conclusion from verses 22 and 23, which specify six Q^eR^eSh at the west side and two at the corners, hence eight in all, and each at 1½ ells broad would give 12 ells for the width of the floor of the tabernacle, but from other specifications the floor was only 10 ells, hence when the Q^eR^eSh is 1½ ells thick the structure would be 12 ells on the outside and only ten ells on the inside. But what about the corner Q^eR^eSh? This he miters with the last Q^eR^eSh coming from either side north and south, and in the top he has some ring arrangement to satisfy a textual point. The top or roof of the Tabernacle he constructs with poles on which the goats' hair canvasses are stretched (pp. 77, 80). All these changes and additions are permissible to the author according to his rule (1) stated above.

(g) The next work I would mention is *Die Stiftshütte, der Tempel in Jerusalem und der Tempelplatz der Jetztzeit, dargestellt von Conrad Schick, Königlich Württembergischer Baurat in Jerusalem. Mit 47 in den Text gedruckten Abbildungen und 11 lithographischen Tafeln.* Berlin, 1896.

This author knows Hebrew but not so familiarly as the preceding one and not enough to give his own transla-

tion of the verses concerned in the structure of the Tabernacle from their original. He speaks often of Luther's translation. He seems to rely upon Talmudic traditions, upon Josephus, and old and modern commentators. He is commendably modest, and to this he is induced by the difficulties which the original text apparently presents. He gives illustrations both of the ridge construction and of the square box construction of both of which he says he made several models. He, too, sees the difficulties arising from the absence of statement in the original specifications as to the thickness of a Q^eR^eSh which he accepts to mean "plank," and finds himself cornered when he comes to the two corners on the west side of the tabernacle. There he gives seven different illustrations from seven different theories by seven different authors. And as none of these concern themselves about the distinct specification in Ex. xxvi. 17 that all the Q^eR^oShⁱIM in the Tabernacle must be alike whether a wall Q^eR^eSh or a corner one, so this author, too is not concerned and satisfies himself modestly by giving seven different possibilities. The difficulties with the coverings this author sees also, and is inclined to the Paine and Fergusson idea of a gable roof on the tabernacle.

(10) The last work I mention is *The Tabernacle, Its History and Structure*, by the Rev. W. Shaw Caldecott, Philadelphia, 1904. This is a book of 236 pages, of which 156 pages are devoted to the demonstration of "The Triple Cubit of Babylonia," and by these varying measures the difficulties of the construction of the tabernacle are to be solved. The author assumes that there existed a tabernacle before the Tabernacle, the pattern of which was shown to Moses on the Mount. That pretabernacle was placed around the twelve pillars and the altar mentioned in Ex. xxiv. 4 and into it the other one was built in which the twelve pillars were so distributed that a ridge-pole could be provided to keep off rain and bad weather. The

Q^eR^eSh, according to this author, was a single board provided with two tenons to fit into two thresholds and the corner Q^eR^eSh at each end of the south and north sides joining the west side were cut out of a solid beam. The specification of Ex. xxvi. 17, that all the Q^eR^oShⁱIM should be alike is passed over in silence.

DIFFICULTIES REMOVED.

There are no difficulties in the *Hebrew* text. A Hebrew like Moses, or Bezaleel, had only to know the law that the square of the hypotenuse of a rectangular triangle is equal to the sum of the squares of the other two sides, then having heard *all* the specifications of the text, he could make his plan first, and proceed to construct the Tabernacle by common workingmen. The difficulties are only in the translations and these have been influenced by unscientific traditions. These aside, the difficulties vanish. But to remove these it will be necessary not only to give a correct translation but to accompany the same with a commentary, which I shall proceed to do.

Exodus XXVI.

(1) "And the dwelling thou shalt make of ten cloths, of twisted linen, and blue, and purple, and wormred. Of cherubimic design shalt thou make them."

In xxvi. 1 the "dwelling" is spoken of. But a dwelling cannot be made of cloth; the word, therefore, here must mean only some important part of it. The "twisted linen," i. e., the linen thread, need not be fine, but only twisted, so as to correspond in the weaving with the other colored thread, which is dyed in the twisted state. The design, or pattern, was to consist of various cherubs, hence the plural "cherubim." Nor was the design to be finished in one piece of cloth, but to begin in one and continue in the rest of the pieces, as our draperies are designed. The

capacity of the looms then obtainable was of course duly considered.

(2) "The length of each cloth, twenty and eight by the cubit, and the width four by the cubit, for each cloth; one measure for all the cloths."

"The cubit," one well known, of course, to speaker and hearer. Israel may have had a different cubit from the Egyptian one, one which Jacob may have brought with him when he came to sojourn in Egypt. The proportion of each piece of cloth was 7:1, and this proportion would have to be preserved in the smaller subdivisions of the cubit, without fractions.

(3) "Five of the cloths shall be joined one to the other, and five cloths joined one to the other."

"One to the other," literally "woman to her sister," denotes the demand of perfect coaptation of piece to piece on account of the pattern which was complete in each set of five pieces.

(4) "And thou shalt make loop-holes of blue upon the border of the one cloth at its joining end, and so shalt thou make in the ending border of the second cloth at the joining."

The word which I render "loop-hole" is $L^{\circ}L^{\circ}$,² and as such occurs in this place only. It is evidently an ancient Aramaic feminine form from the masculine $L^{\circ}L^3$ found in the masculine plural in 1 Kings vi. 8, where it refers not to "winding stairs," but to the several apertures in the ceiling of the lower tier of cells, through which the stairs led to the next upper tier above.⁴ Those who translate the word "loop" follow the careless example of Onkelos who certainly is of less authority in archeological matters than the more ancient Septuagint which supports my ren-

לול³ ללא² יריעה¹

⁴ Compare Buxtorf's *Lex. Chald. Talm. and Rab.* Fisher's ed., Leipsic 1875, p. 574.

dering. These loop-holes were worked out with blue thread. They did not disturb the cherubimic pattern, for there it came to a conclusion, in the five-cloth breadth.

(5) "Fifty loop-holes shalt thou make in the one cloth, and fifty loop-holes shalt thou make in the edge of the cloth, which is in the joining of the second one; the loop-holes fitting oppositely one to another."

The Common Version's rendering: "that the loops may take hold one of another," is impossible, both linguistically⁵ and because the loops had to take hold of the taches that intervened between them, and not "one of another."

The proportion 50:28 seems strange, but in 25 inches the cubit is 14:1. But these 50 loop-holes together with the 50 in the opposite spread are related to the 50 crooks by which they were joined, so that the relation is $50:2 \times 28 = 25:28$ and in inches it is $25:700 = 1:14$.

(6) "And thou shalt make fifty golden crooks, and join the cloths one to another by the crooks; and the dwelling shall become one."

The form and name of the crook ($Q^eR^eS^6$) is derivable from the meaning of its verb-root $Q^oR^oU^s$ which means "to stoop," as in carrying a burden upon the back. It occurs in Is. xlvi. 1, 2. Its form might have been thus:



The shanks would be drawn sufficiently apart from each other to admit the thickness of the worked-out edge of the loop-hole to pass, and then lodge on just the half of the base; then the same with the opposite loop-hole would form a steady joint.

⁵ טִּקְּלָהּ = "fronting," is not קִבְּלָהּ = "receiving."

⁶ קִבְּלָהּ

⁷ קִבְּלָהּ

We have now a spread of 28×40 , a proportion of $7:10$. What the object of this division into 2×20 is, is evident from verse 33.

(7) "And thou shalt make goats' cloths for the tent upon the dwelling. Eleven cloths shalt thou make them."

The object of the number eleven is evidently for the purpose of breaking joints with the lower spread, and its better protection. But this will give a surplus.

(8) "The length of each cloth thirty by the cubit, and the width of each cloth four by the cubit, one measure for the eleven cloths."

Here is again a surplus in the length which is evidently for the protection of the lower spread. The proportion of each cloth is $30:4=15:2$.

(9) "And thou shalt join the five cloths apart, and the six cloths apart. And thou shalt double the sixth cloth toward the front of the tent.

(10) "And thou shalt make fifty loop-holes upon the border of the one ending cloth at the joining, and fifty loop-holes upon the border of the second joining cloth.

(11) "And thou shalt make fifty copper crooks, and bring the crooks into the loop-holes, and join the tent, and it shall become one."

The sixth piece of cloth being doubled upon itself, and coming to the front, would make this upper spread to break the loop-holes' joint of the lower spread, by covering it with the middle of the sixth goats' cloth (reckoning from the front), which would go 2 cubits further, and thence from its loop-hole's joint it would go 20 cubits still further. The proportion of the original six joined cloths would be $24:30=4:5$, and with the one cloth doubled upon itself, $22:30=11:15$. The other five joined cloths give $20:30=2:3$. The entire spread without folding the sixth cloth, gives $44:30=22:15$; with that piece folded, $42:30=7:5$.

(12) "And as for the surplus spread in the cloths of the tent, half of the surplus cloth shall spread upon the backside of the dwelling." -

When we lay the two entire covers upon each other, there would be 18 cubits of the lower cover from the loop-hole's joint of the upper cover to which the 20 cubits of the smaller portion of the upper cover would correspond and thus give us 2 cubits of surplus; of this the half only, viz., *one* cubit, is specified to spread or trail beyond the dwelling. Where then is the other one cubit to go to? This will be fully accounted for when we come to know the true length of the ceiling of the Tabernacle, as given in the construction of its frame-work.

(13) "And the cubit of this and the cubit of that in the surplus in the length of the cloths of the tent, shall spread upon the sides of the dwelling to cover it on this and that side."

It will be noticed that the specifications do not say a word about the stakes and ropes which usually belong to a tent. The entire lower spread is spoken of here as "the dwelling," and the entire upper one as "the tent"; and the presumption would be that they would make one closed whole with the supporting frame-work except at the back side, where there is to be a trail of one surplus cubit back of it. See verse 12.

(14) "And thou shalt make a cover upon the tent of reddened ram skins, and a cover of Tahhash skins above."

The "cover" here is called $M^iKhS^eH^8$ and is derived from the verb $K^oS^ouH^9$, meaning always "to cover close down" upon the object covered. It must be clearly distinguished from $S^oK^ouH^{10}$, which is a transposition of the letters of the former verb and means not "to cover" but "to over-shadow." By attending to this distinction much confusion will thus be avoided. The two covers here must

⁸ מקסה

⁹ קסה

¹⁰ קסה

have reference to the top tent cloth alone, and not to the walls of the Tabernacle.

Hitherto the specifications have spoken of the soft parts of the structure. How were its hard supports, its frame-work, to be?

(15) "And thou shalt make the styles for the dwelling of upright standing shittim planks.

(16) "Ten cubits the length of the style, and a cubit and half a cubit the width of each style.

(17) "Two arms to each style, sloping one to its other. Thus shalt thou make for all the styles of the dwelling."

The word which I render "style" is Q^eR^eShⁱ and occurs only in this place, and once more in Ezek. xxvii. 6. Its plural is Q^rR^oShiⁱM.¹² On the understanding of this word depends the entire understanding of the structure of the frame-work of the dwelling and the disposition of its coverings. The specifications give a full description of it, and from these the true meaning of the word must necessarily become clear. The styles were to be made of "upright standing shittim planks." In verse 37 we read of "shittim pillars," because those pillars may not have been made of planks. But in the construction of Noah's ark, Gen. vi. 14, we read of GH^aTS^{ai}I G^{ou}Ph^eR[;]¹³ and in the construction of the ark of the testimony, Ex. xxv. 10, we read of GH^aTS^{ai}I ShiⁱTTⁱIM.¹⁴ In both instances the first word is in the plural number and in the genitive case. We cannot, therefore, translate, "of woods of gopher," and "of woods of shittim," but "of planks of gopher" and "of planks of shittim." The rendering of "wood" in the singular by our Common Version is inaccurate and misleading. The length and width of a style is 10 and 1½ cubits. Each style was to have two arms, I^oD^{ou}Th.¹⁵

The reader who is not acquainted with the Hebrew language needs an exposition of this word I^oD^{ou}Th. The

11 קִלְשׁ

12 קִלְשִׁים

13 עֵצֵי גִפְרִי

14 עֵצֵי שִׁטִּים

15 יָרוּת

Hebrew language has two genders for its nouns, masculine and feminine. It has also two plurals, one which designates things that are two in nature, as hands, feet, eyes, ears, etc., and the ending of this dual plural is *aim*. The Hebrew word for hand is I^aD (pronouncing *I* as *y* consonant). The dual plural of I^aD is therefore I^oD^{ai}IM, meaning "hands." But when the word "hands" refers to other things than the two hands of a human being, as for instance to the arms of an armchair or axles of wheels, or figuratively to shares, parts, powers, etc., the plural of I^aD does not have the dual plural form but the ordinary plural of the feminine gender which is V^{ou}Th; and in this case the plural of I^aD is I^oD^{ou}Th. This word occurs but seventeen times in the Hebrew Old Testament, while the dual plural of I^aD, viz., I^oD^{ai}IM, occurs 252 times. In Gen. xliii. 34, our Common Version has this word rendered with "times": "but Benjamin's mess was five times (I^oDV^{ou}Th) so much as any of theirs." 2 Sam. xix. 3: "we have ten 'parts' (I^oDV^{ou}Th) in the King." 1 Kings x. 19: "and there were 'stays' (I^oD^{ou}Th) [marginal reading 'hands'] on either side on the place of the seat."

For "tenons" as rendered by Onkelos and our Common Version, there is not the slightest linguistic ground. But two arms must proceed either from a broad shoulder on either side of it, or from a common point. The text says: "they shall be sloping one *to* another." The word "sloping" is M'Sh^{oo}L^oBh^{ou}Th¹⁶ according to the comparatively modern vowelings of Jewish tradition, which makes a *passive participle* of the original consonants of the word. It would be better to vowel the word to read M'Sh^aL-Bh^{ou}Th,¹⁷ as an active participle; but this is of less account. The greater difficulty is that besides in this place this word occurs only in the construction of the pedestals to the ten

¹⁶ משלכת

¹⁷ משלכת

lavers in Solomon's Temple (1 Kings vii. 28, 29), where it occurs in a derived plural masculine noun. Now we might study the meaning of the word there and apply the result to our place; but since Exodus is an earlier Hebrew than Kings, it is logical to study the word in the former and apply the results in the latter. Is it correct to translate the verb-root $Sh^oL^{ou}Bh^{18}$ as "to slope"? We shall see when we come to have a full understanding of what a "style"¹⁹ is. At this stage of the specifications for the entire structure we do not have it, for here they stop describing a style and proceed to state how many styles should come to each wall, and on what they were to rest. We listen, therefore, with Moses.

(18) "And thou shalt make the styles for the dwelling, twenty styles at the arid south side.

(19) "And forty silver sockets thou shalt make underneath each style of the twenty; two sockets underneath each one style, for its two arms, and two sockets underneath each one style for its arms.

(20) "And for the second flank of the dwelling on the north side, twenty styles;

(21) "And their forty silver sockets, two sockets underneath each one style, and two sockets underneath each one style.

(22) "And for the two hips of the dwelling westward, thou shalt make six styles."

There were only three walls then. The architectural terms here are borrowed from anatomy and are therefore very clear. We have two parallel flanks which terminate, as it were, in two hips between which comes the inclosing third wall. On the ground, then, we have an oblong of 30×9 cubits, open on the east. But since the two arms of a style were inclining towards each other, the corners would be left open. Let the reader take two narrow strips

¹⁸ שִׁיב. It may be put in the category of biliteral roots SHL with a determinative third letter as שלב, שלח, שכך, all denoting rapid movement or direction away from the perpendicular.

¹⁹ קֵרֶשׁ

of paper of equal length, and double them across their length and he will have two two-armed styles. Let him then put the width of one arm at right angles to the width of an arm of the other style, so that he will have two equal lines at right angles on the ground, and he will see that the corner formed by the two styles remains open. How shall this corner be closed up? We listen with Moses to the specifications.

(23) "And two styles thou shalt make for the cut-out corners of the dwelling at its hips."

According to the specification given in verse 17, all the styles of the dwelling must be alike; the two styles, therefore, for the two cut-out corners can make no exception. The scientific problem is to make such styles, by the dimensions and description already given, as would be all alike and close up the two cut-out corners. Let the reader make a third style precisely like the two he has made already and try to close up the cut-out corner with this third style; he will see that unless the arm of his style is 10 by $1\frac{1}{2}$ he will not be able to do it. And will he then be able? The question is, How far is one arm of a style to be from its fellow? True, indeed, the specification in verse 17 says that the arms should slope to one another; but at what angle? And are the arms to meet above, or remain at a distance from each other? Again we listen with Moses.

(24) "And they shall become twinning below, and together whole shall they become upon its head, unto one and the same housing."

"So shall it become for the two, for the two cut out corners shall they become.

(25) "And they shall become eight styles; and their silver sockets, sixteen sockets, two sockets underneath each one style and two sockets underneath each one style."

The first part of verse 24 must refer to all the styles

if the specification of verse 17 is to remain inviolate. But lest the difficulty of the corner style should lead to an attempt at such a violation, the specification says in the second part of verse 24 that there must also be styles of this same kind for the two cut-out corners. Then it says that all the styles at the western ends of the two hips of the dwelling shall be counted as eight, to show again that the two corner styles must be like the six of the west wall and of course the other walls. But am I correct in translating M'Q^{oo}TSGH^{ou}Th²⁰ as "cut-out corners" in verse 24? Let this be answered by the same architectural term in Ezek.

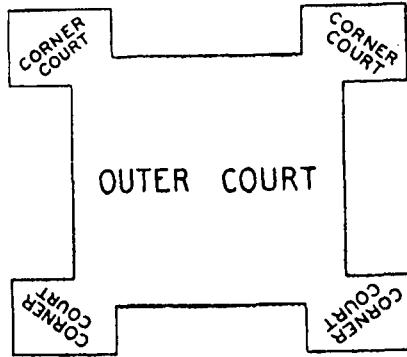


Fig. 3.

xlvi. 21, 22. "And he brought me out into the outer court, and made me pass in the four [cut-out] corners; and behold a court in the [cut-out] corner of the court, a court in the [cut-out] corner of the court. In the four [cut-out] corners of the court, smoking courts, forty long and thirty wide; one measure for the four from the [cut-out] corners." Let the reader leave out what I have put purposely in brackets, and ask himself, How can it be said that a court 40×30 was in the closed corner of another court? And again, how can it be said that a

²⁰ מִקְוֵי תַּיִת

person *passed* in a corner? Is it not evident that the four corners of the outer court were *cut-out* corners?

The foregoing figure, I think, will explain itself sufficiently.²¹

The specifications about the styles are here at an end, for having shown us this cut-out-corner resulting from the shape of the styles, and having told us to close up that corner with a style we are left to infer what the perpendicular height must be, which is the same as inferring its stretch below from arm to arm; and as to this height no specification is given, for this will differ by a minute fraction in the corner styles. Nor is there any specification given as to how deep the planks of a style are to be sunk into their sockets, for these two unspecified items will correct each other. The scientific law which Moses had to know in order to proceed unhampered, is what we know as the forty-seventh proposition of Euclid, said to have been discovered by Pythagoras about 500 B. C. Fig. 4 will make the whole thing plain.

BCGD is the inside plank of a style at the hip of the wall on the north side at its terminus, meeting the end of the west wall at C; BD is the ridge of this style; and BDMN is its outside plank. ACFH is the inner plank of the style of the west wall, meeting the terminal style from the north at C, and there making with it a right angle on the ground. AF is the ridge of this west wall style, AFEL its outside plank. It will now be seen that AB is the ridge of the corner style, closing in the corner. If we imagine a perpendicular rising from the point C, and terminating on a level with the ridges AF, AB, and BD, then the line AB becomes our *diagonal of construction*, to show us the half distance between the arms of a wall style at the base. For

²¹ With this definition of *קִקְצֵי* the reader will understand better the passages in 2 Chron. xxvi. 9; Neh. iii. 19-25; also Lev. xiv. 41, and also Psa. xlv. 9, where *קִצְיָעוּ* means "dusted in corners and folds."

if we imagine all the three ridges coming down straight upon the ground, they exactly halve that distance. Then AB is the hypotenuse of the triangle whose equal sides are AC and CB. Now the 47th of Euclid proved that $AB^2 = AC^2 + CB^2$, and since the two sides here are equal, then $AB^2 = 2BC^2$, and $BC = \sqrt{AB^2}/2$, and thus Moses knew as well as we do what the half distance between the two arms

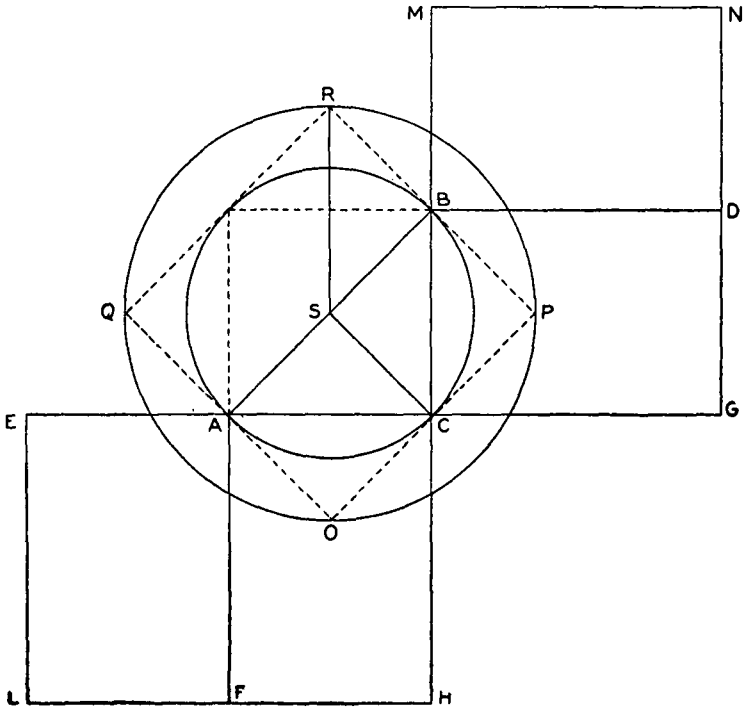


Fig. 4.

of a wall style was at its base. And knowing this, Moses could, as we can, find out the exact height of a wall style, as will be seen from Fig. 5. BC we know is ten cubits, CI is our BC of Fig. 4 whose numerical value we have just ascertained, so we know what the two sides of the triangle CBI are; and as the angle CIB is 90° , and is opposite the longest side of the triangle, then from these three

known functions we can ascertain the third side of the triangle, BI, which is the perpendicular height of the wall style CBK.

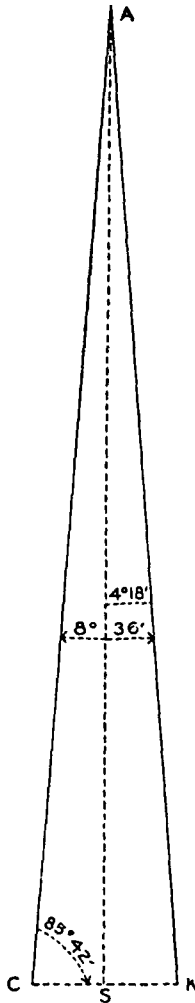


Fig. 5.

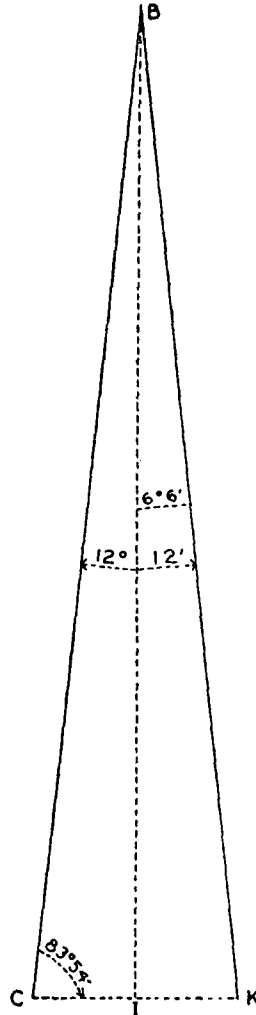


Fig. 6.

But is this the same as the perpendicular height of a corner style? No; for referring to Fig. 4 we see that SC is half the distance between the two arms of the corner

style, and this is just one-half of our diagonal of construction, viz $1\frac{1}{2}/2 = \frac{3}{4}$ of a cubit, less therefore than BC which we have ascertained. Therefore must the perpendicular height of Fig. 6, AS, be more than BI in Fig. 5, the difference being only 0.0285 of a cubit. This minute difference could be easily removed by sinking the plank ends, OP and QR of Fig. 4 (the same as AC and AK of Fig. 6) just that little deeper in their sockets than the planks of the wall styles were sunk in theirs, and for this there is no specification to the contrary. With this correction the ridges of the corner styles come on a level with the rest.

Without previously knowing the meaning of the Hebrew noun Q^eR^eSh we have obtained it from its description and specification in the text, and we can see now how admirably such styles were adapted to fulfil all indications. They combined strength with lightness and compactness for carriage. They would also afford storage room for the appurtenances of the Tabernacle when not on the march, and would probably answer as good a purpose as Mr. Fergusson's cells, (see page 590) without violation of either the Bible text or Josephus. The planks of a style did not need to be thicker than one inch, for against the possible bending of such a long plank provision was made in the next specification, both as to this and the compactness of the walls of the structure at the same time. The two planks were of course beveled at the top to the now ascertained angle, and held together by a strong metallic housing, band or ring. Below, each plank rested on a socket of a talent of silver, about 93 pounds (Ex. xxxviii. 27), which together with the other provisions, next to be considered, kept the planks from slipping out of position. In taking down the structure the planks had only to be pulled out from this top housing and laid together on the vehicles subsequently provided. Compare Num. vii. 8,

with iv. 29-33. 96 planks loaded on four carts will give to each 24 planks, each about 293 pounds (without their gold plating), packing to a height which would leave room to spare for the other things belonging to the styles. Then on a little reflection it will be seen that the three inner sockets of a corner would have to be fitted into each other, thus forming an admirable starting point in laying out the ground at an erection of the structure.

If very ancient traditions are of any value in proving the truthfulness of my discovery as to the real shape of the Q^eR^eSh which I deduced from the simple text, then I would point the reader to the fact that unless that shape was as I say we cannot understand the Septuagint translation (or better, paraphrase) of verses 18, 20, 27, (see pages 570 and 578). And this is the same tradition that we have already met with in that other Babylonian rabbinical party on page 583. Yet from neither of these can we get an answer to the important question, What was the thickness of a Q^eR^eSh at its base? for both of these declared a Q^eR^eSh to have been a solid timber. Hence the Babylonian Talmud simply guessed that it was one cubit, and left us with the absurd impossibility as to the weight of a Q^eR^eSh. And yet they speak there (Shabbath folio 98, page *a*) of the 48 Q^eR^oShⁱIM beams being loaded on 4 two-ox carts! But I stumbled on a far clearer tradition as to the shape and construction of a Q^eR^eSh in the Jerusalem Talmud (Shabbath, Chap. 12, Mishna 3, and the Gemarah to it). It is as follows: "Any one who writes two letters (on the sabbath day), whether with the right or the left hand, whether of one or two names, or whether of two signs in any language, is guilty (of violating the sabbath). Said Rabbi Yose,²² there is no guilt in two letters, except they were for marks, for in this way they marked the Q^eR^oShⁱIM of the Tabernacle, in order to know each other's mate." To this the Jerusalem Ge-

marah has the following: "Who taught that thing about *the two signs*? (Answer): Rabbi Yose did. What is the meaning of 'in any language?' (Answer): If he wrote a Greek Alpha for an Hebrew Aleph. But was not that marking for fear, lest one put the lower end up and the upper end down? (Answer): They were made like writing reeds (i. e., bevelled off at one end). But was it not for fear, *lest one put an inside one outside, and an outside one in*? (Answer): The housings (viz., those mentioned in verse 29, which they declared to have been on the outside planks) show this. But was it not for fear, lest they be interchanged? (i. e., those of the north south and west). Answered Rabbi Ahha: Their (respective) *inclines* were written on them. (N. B., the Septuagint, verses 18, 20, 27). Well, what if they are changed thus? Answered Rabbi Aimi, It is said (Ex. xxvi. 30), 'thou shalt put up the Tabernacle according to its judgment,' and is there a judgment for a plank? But this is what it means: When a Q^eR^eSh was found worthy to be put north, it must be put there, and if south, then south." The unprejudiced reader must see here how much certain traditions knew of my discovery. And yet how many Jewish rabbis, and one of them not less a one than the great Maimonides of the twelfth century A. D. (see his comments to this Mishna), read these traditions and did not understand them. And how many Christian theologians went on theorizing about the Tabernacle, and did not even care to know about these traditions.

I may now return to the lexical consideration of the words which I translate "style" and "sloping," and which I omitted on pages 599 to 601. From the "sloping" structure of a "style," which the text itself teaches us, we can

²² This is Rabbi Yousse ben HHalaftha of the first half of the second century A. D. (*Hamburger Realencyclopedie* II, s. v. "Josse.")

be certain that the rendering of Sh^oL^{ou}Bh²³ as "to slope" is the correct one. This will help us to understand the description of the pedestals of the ten lavars of 1 Kings vii. 28, 29. The Sh'L^aBⁱIM,²⁴ "slopes," rendered by the Common Version "ledges," are the side slopes on which rested lion, ox and cherub, as is seen in Fig. 7. And if the

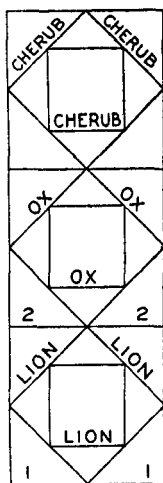


Fig. 7.

reader observes that each of these three squares is so constructed as to give three different radii with which to describe circles in and around them, he will see that this structure probably had reference to the heavenly vision of the first chapter of Ezekiel. And who knows but that this refers to the relation of the radius to the circumference?

As to the word Q^eR^eSh²⁵ let the reader examine thorough and honest authorities, and he will find that the word is not to be found in any language cognate to the Hebrew, with the sense it has in our place. Since I am not writing exclusively for Semitic scholars, I must say no more here, but if any such should challenge my assertion I am ready to substantiate it fully. My own explanation of this unique word is that *it was coined specially for this occasion*. Not the entire word, however, but only the last letter was added to the two-lettered root QR,²⁶ which is common to both Semitic and Indo-Germanic languages. This is acknowledged by Dr. Friedrich Delitzsch in his *Studien über indogerm.-semit. Wurzelverwandtschaft*, Leipsic, 1873, pp. 88 and 89. I differ, however, from him and others as to the primary meaning of this root. It does not denote, I think, "cold and contraction," but "separation from and joining to a point." This meaning is recognizable in the

²³ שָׁלַב

²⁴ שְׁלָבִים

²⁵ קֶרֶשׁ

²⁶ קר

Semitic Q^eR^eN,²⁷ the Indo-Germanic *keras*,²⁸ *cornus*, horn and crystal. To this root QR was added a Sh in coining the word Q^eR^eSh,²⁹ and that for *arithmetical and geometrical reasons*.

There is no denying that the Hebrews must have used the letters of their alphabet for numerical purposes, since they had no other numerals in use, and without numerals no civilized life is at all supposable.

From Fig. 4 on page 605 we saw that the formation of the two corners at the west wall of the tabernacle were easily constructed by the Pythagorean theorem of the right-angled triangle, and that this afforded the solution of the construction of all the styles in the walls. When I studied this question thirty years ago the solution occurred to me at that time that Moses, or whoever wrote this account of the tabernacle, learned that theorem in the same place where Pythagoras later learned it, viz., in Egypt. But this does not answer as to the origin of the word Q^eR^eSh of which the numerical values of the letters are 1, 2, 3, the last letters but one of the ancient Semitic alphabet.³⁰

Leaving out then the last letter Thau, whose number is 400, or 4 in digits, these stared me in the face. I was familiar with cabalistic numerics, mystically called G'M^a-TRIA. I reflected upon the fact that the first three numbers, 1, 2, 3, can not construct the Pythagorean theorem, but the three numbers next to and connected with them, 3, 4, 5, can. Now is there a connection, I asked myself, between the 1, 2, 3, and the 3, 4, 5; that is, a connection between arithmetic and geometry? And what connection have these with that unique word Q^eR^eSh?

I shall take the liberty of repeating here the cabalistic operations which gave me the explanation. I know very well that to the reader of the twentieth century these will

²⁷ קרן

²⁸ κερως

²⁹ קרש-ש+קר

³⁰ ק, ר, ש

seem very improbable. But we must bear in mind that the ancient Israelites thought in a way that anticipated the Cabala, and in explaining their writings we ought to think in the way they did even though it may appear abstruse to us. This I did. I drew a right-angled triangle the perpendicular, base and hypotenuse of which represented respectively the numbers 1, 2, 3, and wrote around it that unique word in digits 1(00), 2(00), 3(00). It told me that $1(00)+2(00)=3(00)$,³¹ but should I continue around the triangle now from left to right and add 1(00) to 3(00) it would give me 4(00),³² yet when I added the omitted letter to the two previously added together, the warning word "False!"³³ stared me in the face. I took it to mean that 1+3 equals 4 arithmetically but not geometrically, for line 1 + line 2 gives me more than line 3, as this straight line between the two points of the apex and the base line is shorter than lines 1+2.

Here then was a riddle before me in Hebrew numerals composing a word. I read again my triangle in the reverse direction and beheld the consonants which gave us the word QaSh^eR,³⁴ which means "to bind" or "to combine." I took this as a hint to combine not letters into words, but numbers and sides together. I added the Shin to the Koph, the 3 to the 1, and I got the last letter of the Hebrew alphabet, the Thau which equals 400 or 4 in digits, and I put it on the right side of the triangle which first had contained the digit 1. Then I added this digit 1 to the digit 2 of the base line and so I got 3 for this line. I further added the digit 2 to the digit 3 and obtained $3(00)+2(00)=5(00)$, for which result there is no single numeral letter in the ancient Hebrew alphabet, and I left the number 5 with its numeral letter Hey³⁵ at the hypotenuse where the 3(00) had stood before. In this way I got a combination

³¹ ש=1+2 ק

³² ה=2+3 ק

³³ שקר

³⁴ קשר

³⁵ ה=5

of letters³⁶ which compose no Hebrew word that I knew of, but I had a new triangle with the same right angle at the base and the sides 4 and 3 at the perpendicular and base lines as in Fig. 8.

“Ah,” I exclaimed, “here is my Pythagorean theorem, and I have only to square the sides to get my hypotenuse!” And so I got my numbers, 4, 3, 5, evolved from 1, 2, 3, but no verbal meaning to the evolution.³⁷ I looked and reflected on this puzzle week after week, but it often happens that a solution to a question may come when you are not conscious of reflecting upon it.

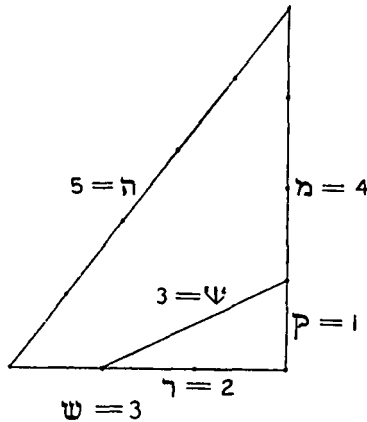


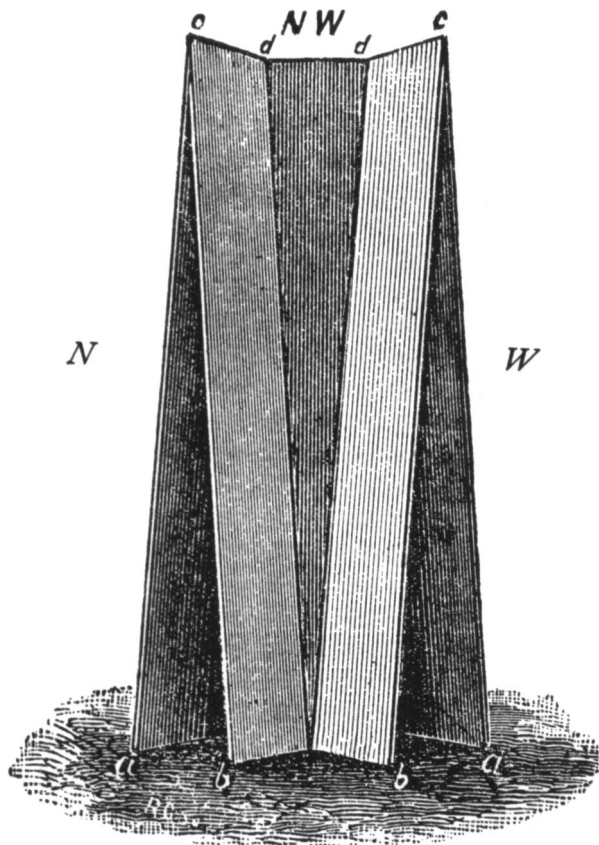
Fig. 8.

It happened, I think, some time about the autumn of 1880 that I came to Cleveland, Ohio, on the invitation of the late Mr. Charles Latimer, to lecture on “The Pyramids in the Bible.” Coming to the house of Mr. Latimer after the lecture I felt tired and restless and did not retire until after the members of the household. I went out into the fresh air on that beautiful starlit night. The puzzle about those numeral Hebrew letters came up in my mind, as had then been usual for weeks and weeks. What could be the

³⁶ ת, ש, ה.

³⁷ ק, ל, ג, ש, ה, מ from קלש.

meaning of those letters Thau, Shin, Hey, or in digits 4(00), 3(00) and 5? I asked mentally. And like a gentle zephyr I heard a whisper, "Mem, Shin, Hey!"³⁸ (for Mem is 4(0)) and I cried out, "M^{ou}Sh^eH!" I stretched my



A PERSPECTIVE VIEW

OF THE N. W. CORNER FROM THE INSIDE OF THE TABERNACLE.

a b, Feet of the terminal north and west styles. *c d*, Ridges of the same. *d d*, Ridge of the corner style.

arms up toward the starry heavens and shouted and laughed, and again I cried. "M^{ou}Sh^eH! M^{ou}Sh^eH!" for that is "Moses" in Hebrew. I began to be anxious about

my sanity, or whether I were not the victim of a dreamlike hallucination, and I quieted myself. If I were mad there was method in it, for surely here was the evolution of 4, 3, 5 from 1, 2, 3 in Hebrew letters and words.³⁹ I looked up at the stars and there was the letter Thau in Orion's belt, and to me it signified 4, *quadra!* Square, of course! I must square the digits of the Mem and the digits of the Shin, and together they would give me the square of Hey. And I went to bed and whispered, "M^{ou}Sh^eH! Moses! Pythagoras! *Eureka!*" and lay awake all that night.

Now, dear reader, mistake me not! I have told you a true, simple story of what happened to me more than thirty years ago and I never told it in public before. But do not take me as proposing or claiming any mathematical talent or providential favor by which I discovered how Moses taught the theorem of the square of the hypotenuse. I am neither fool nor knave enough for that. I simply sought in a peculiar way and found a possible solution of the origin of that unique Hebrew word Q^eR^eSh, which was mistranslated and misunderstood and misapplied for thousands of years by the best scholars of Hebrew, and I am as yet but a humble learner. A curious fact of the relation of the numerals of M^{ou}Sh^eH (Moses) to those of Q^eR^eSh is that the sum of the latter is just half that of the former, 6 and 12.

Perhaps the linguistic reader will be beguiled in my favor if he turns now to Ezek. xxvii. 6, 7, and substitutes the word "style" for "benches," translating thus: "Of oak-trees from Bashan they made thy oars; the people of Ashoorim from the isles of Khittim made thy style of ivory. Linen with inwoven colors from Egypt was thy spread, to be a banner (not "sail") for thee! Blue and purple from the isles of Elisha were thy tent covering!"

³⁹ קרש from משה

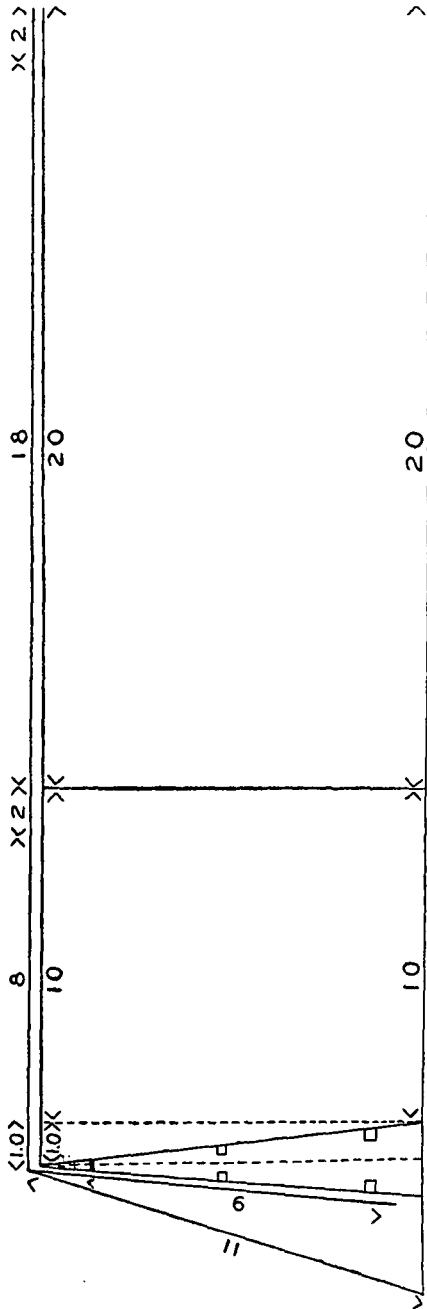


Fig. 9.

Is this not a correct description of a possibly beautiful Tyrian pleasure boat?

(26) "And thou shalt make bolts of shittim planks, five for the styles of the one flank of the dwelling, (27) and five bolts for the styles of the second flank of the dwelling, and five bolts for the styles of the flank of the dwelling at its two hips westward; (28) and the inside bolt inside of the styles, shall be bolting from end to end."

"Of planks," that is, squared. We need not assume with the tradition (see above, page 584), that these bolts were at all on the outside of the styles, for these would spoil the looks of the walls on the inside of the Tabernacle, and be a source of injury to the coverings on the outside by their square housings. They could be excellently disposed on the inside of the styles, two on each declivity, and the fifth would run through housings disposed on alternate opposite planks, and binding the entire long wall of styles to the outer plank of the corner style. And in the same way the bolts would be disposed inside the west wall style planks, two on each declivity, and the fifth bolt binding all these styles as above from one outer plank of a corner style to the opposite one.

(29) "And the styles thou shalt overlay with gold, and their housings thou shalt make of gold; housings they are for the bolts; and the bolts thou shalt overlay with gold."

This vast expenditure of the precious metals on the Tabernacle had very likely a double purpose: (1) to withdraw the people's means of engaging in commerce with neighboring nations and passing caravans, which would necessarily destroy the military discipline and life for which they were to be prepared; and (2) to protect the woodwork against the damage by weather, for the campaign in which Jehovah engaged Israel was from the very start intended to last a whole generation. And lest Israel should, from a natural attachment to and veneration for

a miraculous locality, be tempted to adore that mountain of God, Sinai, Jehovah condescended to wander with Israel in the desert, and have a portable holy dwelling in their midst.

(30) "And thou shalt put up the dwelling according to its adjustment, which thou wert shown in the mount."

There was mathematical judgment necessary for the erection of this dwelling of Jehovah, which we have so long misunderstood. It was certainly not a mere "fashion," as our Common Version has it, that Jehovah is claimed to have shown Moses in the mount.

We can now return to consider the disposition of the two coverings over the length and breadth of the dwelling, which was left unconsidered on page 599. Figs. 9 and 10 will show it.

It will be seen in Fig. 9 that the lower cover goes from the front 20 cubits to its joint of gold hooks, underneath which came the partition curtain of the Holy of Holies. See verse 12, p. 598. Thence it went 10 cubits to a line drawn perpendicularly from the floor. But since the back wall receded from that line to half the base of a style, viz., 1.0606+ cubits, the ceiling cover was by so much longer, and nine cubits was left to cover the outside planks of the west wall. The upper cover, which was doubled in front to the extent of 2 cubits, covered with its 22 cubits to 2 cubits beyond the lower cover. Thence it went 8 cubits to the perpendicular line from the floor; thence it covered 1 cubit of the recess of the wall, and the then remaining 11 cubits trailed to a point 3.64316 cubits back from the lower end of the style planks. This therefore fully explains verse 12. Across the Tabernacle the two covers were disposed as seen in our Fig. 10.

On either side of the ceiling of the Tabernacle there was an excess of 1.06066+ cubits over the 9 cubits width

on its floor, and would therefore require $9 + 2.12132 = 11.12132 +$ cubits of cover for the ceiling, leaving a small fraction less than $\frac{1}{2}$ cubits to cover the sloping out-sides south and north with the lower cover, and $\frac{1}{2}$ with the upper cover, for the same sides, and this is what is meant in verse 13. Neither of these covers reached down to the ground, being evidently left for stretching and shrinking in dry and wet weather of the season. The lower one with the cherubimic design in the admirably selected colors of white, blue, purple and carmine, was evi-

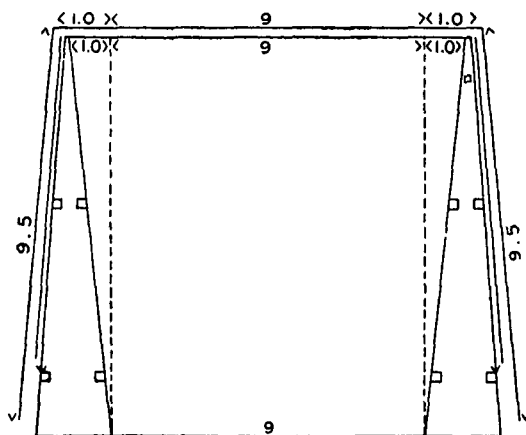


Fig. 10.

dently intended to represent the sky, which came down as it were in front of the Holy of Holies, by the special partition curtain of the same materials, colors and designs (see verses 31, 33), and after overshadowing the outer Holy sanctuary of the priesthood, joined itself by golden crooks to it, and overshadowed with another piece of equal dimensions the inner sanctuary of the Holy of Holies, viz., its ceiling and outside wall. It did not reach the ground, however, for in that dispensation heaven had not yet reached the earth. The question has been asked, why these superfluous 17 cubits for the walls, if it was

only intended for the ceiling? The answer is twofold. (1) The proportions of $20:28 = 5:7$, or $40:28 = 10:7$, must have a mystical significance. (2) It was necessary to balance the 11 cubits of the ceiling by the 8.5 cubits on either side, and thus prevent the drooping in the middle as far as possible. For a further prevention of this drooping, cords and stakes were used (see Ex. xxxviii. 20), and these cords could not be long, and must be within easy reach. And I think that the outward slanting of the inner planks also prevented that drooping in the middle. That in the rainy season the shedding of the water would be provided for by one or two long poles inside the Holy, may be taken for granted. This would not be necessary, however, as the cords and stakes could regulate it. It does not necessitate the untextual gable roof of Messrs. Paine and Fergusson for seven-eighths of the year.

The second or upper cover also did not reach the ground or the sides to within half a cubit, and this was certainly necessary to give room for stretching this heavy canvas to the ground by cords and stakes and by its close pressure on the downward slanting outside planks would help in keeping the inner cover smooth and even as a ceiling. We see here, therefore, the necessity that the housings of the planks for keeping them together in the walls should have been inside the styles. See comment to verse 26, page 617.

How the covers formed themselves exactly on the ground outside as they were stretched over the ridges of the corner styles, I have no idea, not being a tent maker. But it seems to me that the angular pieces, 9×8.5 cubits of the inner, and 11×9.5 cubits of the upper cover, which would result if the south and north walls met the west wall at right angles from top to floor, would be well disposed on their stretching over the diagonal 1.5 cubits ridge of the corner style, and give some plausible form on the ground.

The doubling of the front piece of cloth of the upper cover upon itself certainly served as an excellent seam there, and prevented the unevenness of the line which would necessarily follow if that line was formed by the mere selvedge; or if this were stretched there by cords and stakes then it would necessarily weaken it. But there was also a proportional intention in that doubling, for $44:30 = 22:15$, while $42:30 = 7:5$.

The intention of the excess of the upper cover by two cubits over the lower cover, was certainly for the purpose of breaking joints with the lower cover, especially at the golden crooks, and the resulting one cubit excess in length had necessarily to be disposed of by putting its terminus at some distance from the foot of the back outside style planks. It will be seen now that at the very outset of the specifications, when they spoke as yet of the soft coverings, that the specifier had then in his mind the inclined form of the styles, and the $1.06066\bar{6}$ cubit which would result from it in the excess of the ceiling length over the floor length. Traditionists, theorizers, and our Common Version did not see it, and therefore translated in verse 12, "the half curtain that remaineth," i. e., the whole two cubits, "shall hang over the back side of the Tabernacle," instead of, "the half of the cloth that remaineth," i. e., half of the two cubits, viz., one cubit, "shall, etc." (See page 572).

The inclined form of the styles gives us also a true idea of the partition curtain between the Holy place and the Holy of Holies, as it is ordained in verses 31-33. Its sacro-technical name is $P^oR^{ou}Kh^aTh^{40}$ and both as a derived noun and in its verbal root, is a transposition of the sacro-technical word $K^aP^{ou}R^aTh^{41}$ which in pious haste the Septuagint and our Common Version render "Mercy-

⁴⁰ קרנת

⁴¹ גשמת

seat." K^oP^{ou}R⁴² means "to cover horizontally," and by transposition of letters P^oR^{ou}Kh⁴⁸ means "to cover perpendicularly," but in either case to cover close upon the object covered. Hence the different name of the curtain at the entrance of the Tabernacle, which is called M^oS^oKh⁴⁴ and means only "a loose curtain," derived from S^oK^{ou}H⁴⁵, equal to "overshadow." (See verse 14, p. 598). The curtain before the Holy of Holies was a permanent *immovable* partition. But if the walls of the Tabernacle were perpendicular there could be no entrance to it. And yet the specifications of this curtain say nothing of its being in parts. Looking, however, at Fig. 10, we see at once that there was a triangular space (half of a style in its shorter diameter) left open on either side of the immovable partition curtain. The entrance to the Holy of Holies was passable, but with difficulty.

The spaces of 1.06+ cubits in the ceiling (Figs. 9 and 10) must have been the vague truth which the Babylonian traditionists heard, and they manufactured from it the absurd idea that a Q^eR^eSh (style) was one cubit thick at both its ends (see p. 583), and tried in this way to account for the differences in the length and width of the covers. Those too who maintained that a Q^eR^eSh tapered off to one finger's thickness also held that at its base it was one cubit thick. But neither of them understood that a Q^eR^eSh was made of two planks. This gross neglect of the proper study of the text can not, however, be charged either against the Jerusalem traditionalists who evidently knew that a Q^eR^eSh was composed of two planks, or against the Septuagint translators who rendered the text as best they could and which is fully capable of being understood according to my re-discovery even in their translation. There is, however, a suspicious neglect of the word "length"

" קפיר

" קרף

" קסר

" קנה

in verse 16, as though they meant the perpendicular to be 10 cubits. It will always appear strange to me that scholarly commentators should have neglected to such an extent the study of these more ancient traditions. The great Dr. Bähr knew nothing of the Jerusalem traditions, and blindly and complacently followed the French Rabbi Solomon, who must have known them, but preferred the absurdities of the Babylonians. It shows again that tradition is a good servant but a blind master, if taken as ultimate authority.

In taking leave of the reader I beg him to remember that I have not sought in this study to apologize for any faults or obscurities in the specifications of the Tabernacle. I found none in the original Hebrew. And while I have made a very important discovery, I have proposed no theory. Jehovah's words are true, though even good men misinterpret them.

*Γινέσθω δὲ ὁ θεὸς ἀληθής, πᾶς δὲ ἄνθρωπος ψεύστης, καθὼς γέγραπται. κ. τ. λ.
Rom. iii. 4.*

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