

## THE LINEAR MEASURES OF BABYLONIA.

(Extracts from a Paper Read in a Meeting of the Royal Asiatic Society, by REV. W. SHAW-CALDECOTT.<sup>1</sup>)

For the history of linear measures, two relics from the plains of Mesopotamia are of special interest, the Tablet of Senkereh and the Rule of Gudea. Rev. Shaw-Caldecott made use of both for the purpose of reconstructing the Babylonian measures and also the Biblical cubit.

The history of the two relics and their description are stated by our author as follows:

"Senkereh is a small Arab village standing on the site of the ancient city of Larsam or Larsa, in Southern Babylonia. Not far away from its series of mounds are the Ruins of Warka—the Erech of Genesis x. 10—and of Mukayyar, once the home of the Patriarch Abram. Here, in 1850, Mr. W. K. Loftus discovered a great number of tombs containing baked clay tablets and pottery, the former with rude cuneiform inscriptions impressed upon one or both sides. His most valuable discovery was a 'table of squares,' which, with the late Sir Henry Rawlinson's aid, was seen to confirm the statement of Berosus the Chaldean, that the Babylonians made use of a sexagesimal notation, the unit of which was termed a *sošsus*, as well as of a decimal notation.

"Hommel well expressed the general conviction of Assyriologists when he wrote (*Hastings's Dictionary of the Bible*, 1898, article "Babylonia"): 'On the reverse of the tablet of Senkereh are given the squares and cubes of the cubit from the No. 1 up to 60 [this is a clerical error for 40], and on the obverse the fractions and multiples of the cubit.'

"When it is stated that each side of the tablet has a surface for writing of about six inches square, and that 285 separate characters are still distinguishable on the obverse, and that these require the addition of an almost equal number which have been effaced, in order to complete the system, it will be seen that enormous difficulties have already been overcome in its transcription. The difficulties must have been insuperable but for the use of the microscope, a magnifying-glass having been almost certainly used in its construction. Why a work of such care and elaboration should not have been hardened by being baked, is one of those questions which it is easy to ask and impossible to answer "

We do not here enter into the details of the investigation nor venture to explain the nature of Rev. Caldecott's special work. We only quote his tribute of respect to the ancient Assyrians:

"A tribute of respect is due to the dead-and-gone sages who, some five thousand years ago, worked out for themselves, and for us, this system of arithmetic. With only their right hand to guide them, they elaborated a system which in many respects is superior to that in use amongst ourselves. For theirs was at once decimal and duodecimal, and in their monetary system there could not have been the anomaly of having twelve pence in a shilling and twenty shillings in a pound without any power of simple co-ordination."

The Senkereh Tablet furnishes us with literary evidence as to the "ells" used in Babylonia together with calculations of their constituent fractions. The Gudea

<sup>1</sup>The entire paper appeared in the *Quarterly Statement of the Palestine Exploration Fund Society*, January, 1902. Reprinted by Stephen Austin & Sons, Hertford. The author's address is Tenterden, Kent, England.

Rule sheds some additional light on the use of the "palm," which according to Rev. Shaw-Caldecott existed in two distinct measures, one for the needs of goldsmiths and jewellers and the other for common use. This at least is his peculiar interpretation of the document in question.

As to the rule of Gudea itself, our author condenses the history of its discovery and the description of its nature in the following lines:

"In 1881 M. de Sarzec undertook a series of excavations for the French Government in one of the *tells* of Babylonia, not far from Senkereh. This has since proved to be the site of the ancient city of Lagash or Lagas, the ruins of which are 130 miles south-east of Babylon. It is now known as the village of Telloh.

"Buried in the courtyard of an archaic palace, M. de Sarzec found eight headless statues of diorite. These are now in the Louvre Museum, a cast of one of them having been presented to the Trustees of the British Museum (No. 91,025). Its notice-card bears the date of B. C. 2500.

"This piece of engraved statuary represents King Gudea as a worshipper, in the act of dedicating his palace to the care of some deity. His hands are folded in the attitude of prayer, and on his knees lies a slab of stone. On this slab there is engraved the ground-plan of a building which was evidently of earlier erection than that of the palace, the courtyard of which still exists. Both these palaces stood upon the same site, and have a general likeness of plan to one another. On the slab, besides the ground-plan, are engraved two other details. One of these is a graving tool, which has no message for us, apart from the fact that it is similar in every respect to tools in use to-day.

"The other is a record of the measure, or one of the measures by which the palace was built. It is this feature of the slab which is now to claim our attention. The rule—known as the rule of Gudea—is in the form of a double line cut near the outer edge of the slab. In it are a number of indentations or cuts, which give to the rule its unique value and importance. It is to the great loss of ourselves that parts of this rule are missing, the two corners of the slab, i. e., those farthest away from the king's body, having been broken off and lost.

"Many attempts have been made to restore, by conjecture, these broken-off portions, and thus to complete the rule, but none of these has met with general acceptance."

Dr. Oppert as a result of the measurement of Khorsabad comes to the conclusion that the Assyrian span is ten and four-fifths inches.<sup>1</sup> Coming to the conclusion that we have here two scales side by side, and referring to the Senkereh Tablet, he says: "A hitherto little noticed peculiarity of Column II is the fact that it contained a twofold set of measures." This being noticeable also in other sections, he is struck with the unusual way in which two uniformities are maintained. "So radical a dislocation of the system could only have been caused by some sufficient reason." Mr. Caldecott's hypothesis of two systems of linear measurement seems to explain the difficulty. The "palm" is fundamental in both records, and the fractions drawn from the rule of Gudea concur with the numbers on the Senkereh Tablet. "It is in this coincidence, so often repeated, that we find the correspondence of the Gudean scale and the Senkereh tablet with the early metric system of Western Asia, which hitherto has been unknown."

Our author adds: "This conclusion may prove to be a key which will fit the wards of many locks, and may give entrance to new fields of investigation, for 'science is measurement.'"

<sup>1</sup>See *Records of the Past*, new series, Vol. XI., pp. 22-23 (1878).