context. In this passage, as in the former instance, the word *pheles* precedes *moznaim,* both words being brought together, and occurring in a parallelism. The passage re­ferred to is rendered in our version, “ who hath weighed the mountains in scales, and the hills in a balance.” The word here rendered scales in the plural, is the singular noun *pheles ;* while that rendered balance, is the dual word *moz­naim.* The English therefore would better accord with the original, were the terms in the translation reversed in order, and read thus: “ who hath weighed the mountains in a balance, and the hills in scales.”

Whether *pheles,* however, means properly a steelyard, as Gesenius defines it, may be doubted. The reason for supposing it does, seems apparently to rest on the circum­stance that *kαpheles* in the Arabic (most probably a cor­ruption of *hapheles,* the definite form of the Hebrew word) is the name of the Arabian weighing instrument of the present day ; and because it now is a steelyard, and is known to have been in long and almost exclusive use in Arabia, and indeed in all Asia, that therefore the related or parent word *pheles* must denote the steelyard. But this rests on the assumption that the common balance had never been known to the Arabians. Job, however, who is shewn to have been an Idumæan Arab, and to have resided in **the** north of Arabia,@@1 does not use *pheles,* but *moznaim,@@2* to express the balance ; a word which, as already shewn, de­notes the common or equal-armed one, and at that period of course undoubtedly used in Arabia.

Perhaps both words may therefore be regarded as synony­mous terms for the common balance; the one descriptive of it by reference to its beam or balance-rod, and the other by reference to its pair of scales. This view receives further confirmation from the circumstance that there is one He­brew word in the Bible which may be shewn to refer with some distinctness to the steelyard. Isaiah, in a passage subsequent to that above quoted, when describing the con­struction of idol images, says, “ they (the Babylonians) weigh silver in the balance,” &c. (chap, xlvi. 6) ; and here makes use of the Hebrew word *kaneh* to denote the kind of balance meant. Gesenius, p. 699, explains this word to be *a* *cane, or measuring reed, or scale for measure ; a beam or lever of a balance, or balance itself* The word has thus evident reference to a graduated staff or beam,@@3 and pro­bably therefore when used, as in the present instance, to express a weighing instrument, denotes rather the gra­duated steelyard, of which it is thus descriptive, than an ordinary balance or pair of scales. As it is not used to express a weighing instrument in any other passage of the Bible, and as Isaiah is here giving a minutely graphic pic­ture of the process observed by the Babylonians in the ma­nufacture and correct adjustment of the weight of their gods, it is probable that the instrument named was an east­ern invention, constructed in all likelihood of the sugar or “ sweet cane,” a sense in which the word *hαneh* is also used.@@4 These remarks appear to receive some illustration from the fact, that in China and the East Indies a small steelyard (described in our article Balance, p. 306) is employed to weigh precious metals, gems, &c. ; and to this day is made of wood or ivory, and not improbably also of cane, a substance which, from its combined lightness and strength, is well suited for the purpose.

This is probably the first mention of the steelyard on re­cord, viz. in Isaiah’s time, or about 780 years b. c. ; at which f>eriod it thus appears to have been in use among the Baby- onians. It seems to have superseded the common balance

in Asia ; and, through the Romans, to have come into ex­tensive use in Europe. The annexed figure is a representation of one made in the first century, and not long since recovered from the ruins of Pompeii, which town, with many of its inhabitants and their utensils, lay buried, for nearly eighteen centuries, in the shower of volcanic matter thrown out by Vesuvius, a. D. 79. Like some of our steelyards, this ancient one is provided with two different centres of suspension. It wants how­ever the knife-edged bearers now universally used. In the progress of invention, the modifications of the steelyard have become numerous in the form of compound ma­chines ; but these are of comparatively modern date, and do not require successive detail. Descriptions of the most useful varieties of the balance will be found here, and under our previous articles on the subject ; and as it is in­tended to embrace the present opportunity of classifying their different kinds under distinct heads, references to those already described will be introduced in their proper place.

I. *Balances acting as Levers round one or more Fulcra, and requiring experimental Adjustment when used to ascertain the Weight of a Substance.*

To this class belong the Common, the Roman, the Chi­nese or Indian, the Danish or Swedish, already described under Balance and Mechanics, pp. 358 and 370; and Magellan’s, Mr Bate’s, and Dr Black’s, under MecHANIcs, pp. 371 and 456.

This is a compound steelyard, and is used for ascertaining the weight of loaded carts. The apparatus, of which a ground-plan is here given, is arranged in a boxABCD, which is about twelve inches deep, and is suffi­ciently sunk in the ground to place the highest part of the completed ma­chine on a level with the line of road.

A fixed wooden bridge, by which the horse may pass across the machine, is laid over the middle part of the box. At each side of this bridge is a me­tal wheel-track. On these the cart is rested by its two wheels and a prop-staff. The tracks are fixed to and borne up by a platform (or skeleton frame) placed below the wooden bridge, but above the works. The platform has four short feet, the lower ends of which are formed into small hemispherical cavities. These cavities rest at E, F, G, H, on pointed studs about an inch long. The two studs at E and F are fixed on the crooked lever AKB, with their points upward, and the two at G and H are similarly fixed on the companion-lever DIC. Sharpened studs, also about an inch long, project downward from the four extremities of the crooked levers. The points of these studs rest in small hemispherical cavi­ties, formed at the upper ends of blocks which are fixed as bearers for them in each corner of the box. The short parts of the crooked levers parallel to OL, and near the middle of the box, have their under edges sharpened, and rest on the angle of a sustaining fulcrum IK, which passes through, and is fixed to the lever OM. This lever is also crossed at L by the fulcrum which forms the common centre of movement for the whole machine. The angle of the fulcrum points downward, and rests, as in the ordinary

@@@1 Horne’s Critical Stud, of the Scriptures, 1825, v. iv. pp. 74, 75.

@@@s Job, vi. 2, and xxxi. 6.

@@@• In this sense it occurs in many passages. Thus, Ezekiel, xl. 3-5 : " With a line of flax in his hand, and a measuring reed...and in the man’s hand a measuring reed of six cubits long ; so be measured the breadth of the building,” &c.

@@@\* Thus, in Jeremiah, vi. 20 : “ To what purpose cometh there to me incense from Sheba, and *the* *sweet cane from a far country* ; your burnt-offerings are not acceptable, nor your sacrifices *sweet* unto me.”