

NOTICE OF A REMARKABLE INTAGLIO REPRESENTING THE
CLEPSYDRA USED AT RACES IN THE CIRCUS MAXIMUS.

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AT the recent dispersion of the valuable collection of works of ancient art formed by the late Mr. J. W. Brett, I became possessed of a very curious, possibly unique, intaglio, the subject engraved upon the gem being the ancient Clepsydra.

Although the nature and general fashion or construction of the instrument originally employed by the Greeks, and subsequently used in Rome, for measuring time by the escape of water, may be understood from passages in the works of Aristotle, and other writers of antiquity,¹ representations of the Clepsydra are of very rare occurrence. An example which has been pointed out in a bas-relief at the Mattei Palace in Rome closely resembles in form the hour-glass of our own times.²

The remarkable antique gem (drawn to twice the actual size), which I am desirous to bring under the notice of the Institute, is an intaglio on a "banded agate" (a sardonyx cut transversely) representing two Cupids turned back to back, and supporting in their uplifted arms a huge oviform vase with a contracted mouth, whence issues a stream of water. On the belly of the vase appears a horse at full speed, and a large star (the sun). These adjuncts precisely indicate the subject of the design, the Clepsydra of the Circus Maximus, where the great races were held on December 25, the *Natale Solis*. In a bas-relief of the date of the Lower Empire, figuring the Hippodrome in Constantinople, a similar vase appears, but more simply mounted, being merely traversed by an axis and turned with a crooked handle by the proper official, the entire arrangement being

¹ Aristot., Problem. xvi. 8.

Latin Dictionary, v. Clepsydra.

² Figured in Rich's Companion to the



Antique Intaglio, representing the Clepsydra used at the Races in the
Circus Maximus.

In the collection of C. W. King, M.A.

(Scale, twice the original size).

what is still seen in a large grindstone. By this contrivance the instantaneous inversion of the vase was secured. The contents escaping in a certain definite time showed the number of minutes taken up by each *missus*, or course, of which, at the Great Games, there were twenty-four.

The gem which has suggested this brief notice, in itself a very remarkable relic of ancient art,—a fine engraving of the best Roman period,—doubtless is a faithful picture of the elegant adaptation of such a timekeeper that adorned the Circus Maximus in the days of the first Cæsars.

The clepsydræ used in the ancient law-courts to regulate the time allotted to each pleader were yet simpler in arrangement—a mere vase inverted by an attendant. Pliny incidentally mentions that each marked the third of an hour:—“*Dixi horis pæne quinque ; nam xii clepsydris quas spatiosissimas acceperam sunt additæ quatuor.*”—Ep. ii. xi. 14.

From the fact that so many clepsydræ were assigned to each pleader before opening his case, it would appear that a large number were kept in readiness, filled beforehand, and inverted in succession by the special officer until the speaker's allowance was run out. Hence, in the extant speeches of the Attic orators, we find “water” perpetually used as a synonym for “time.” This custom supplies Martial with a humorous allusion where describing a dull declaimer repeatedly moistening his throat with a glass of water during the progress of his interminable harangue, he suggests that it would be an equal relief both to himself and to the audience were he to drink every time out of the clepsydra itself.³

“*Septem clepsydras magna tibi voce petenti
Arbiter invitus Cæciliane dedit.
At tu multa diu ducis, vitreisque tepentem
Ampullis potas semisupinus aquam ;
Ut tandem saties vocemque sitimque rogamus,
Jam de clepsydra Cæciliane bibas.*”—Ep. vi. 35.

³ The reader who may desire further information in regard to the *clepsydra* of the Greeks and Romans, or the water-clocks of mediæval times, may be referred to the observations by Dr. Schmitz on the word *Horologium* in Dr. Smith's Dictionary of Antiquities, and to the

curious particulars collected by Beckmann, in his History of Inventions, in the Dissertation on Water-Clocks, and also in that on Clocks and Watches. Notices of writers who have treated on water-clocks are given by Fabricius Bibliograph. Antiquaria, p. 1011.

This contrivance in its primitive form, it will be perceived, only marked the lapse of a fixed portion of time, and not the steps of its actual progression. Its improvement and adaptation to this important use was due to Ctesibius of Alexandria some two centuries before our æra, a mechanician who had paid particular attention to hydraulics. The principle of his water-clock was simple and effectual; a cylindrical vessel filled with water bearing up a float loosely fitting its interior, out of which rose a vertical gauge marked with the hours, which by its gradual ascent, as the water entered through a small aperture into the cylinder, showed the passing away of the day with tolerable accuracy. Indeed, after due allowance had been made in the first construction for the variation in the rapidity of the water's escape as the weight of the column above diminished, in the equable climate of Egypt, where the atmospheric pressure may be assumed as almost constant, a very efficient timekeeper, never liable to get out of order, was thus readily attainable. And such must have been the case, since the principle was applied to the most complex motions, for Vitruvius has a chapter upon the construction of a clepsydra which, besides the hours, told the moon's age, the zodiacal sign for the month, and several other particulars,—in fact, it was a regular astronomical clock. His details, though in their time a valuable guide to the horologists used to the making of such machines, are now so obscure and complicated as to afford but a confused idea of its mode of working. The principle, however, is sufficiently intelligible: the float, *scaphium*, or *phellos*, as it moved upwards, by means of the vertical column fixed in it, drove different series of cog-wheels, *tympana denticulis æqualibus*, which impelled in their turn other sets, “by means of which figures are made to move, obelisks to twirl about, pebbles or eggs are discharged, trumpets are sounded, and many other tricks, *parerga*, put in action.”⁴ The admission-pipe was made either out of gold, or a gem perforated, in order neither to wear away nor to be liable to fouling. But there is a circumstance that renders it extremely probable the common Roman clepsydra had both a regular dial-face and one hand, set in motion by a string and float, exactly

⁴ Vitruvius, lib. ix. c. viii.

like the index in our wheel barometers. In his *horologium anaphoricum*, the dial, painted with the world and the zodiac, was traversed by an axis, on which was wound a flexible brass chain, supporting by its one end the float, on the other a balance weight, *saburra*, equal to that of the float. As the latter rose with the water, so the balance weight, descending, unwound the chain and made the dial revolve. In two of Albert Durer's engravings, known as "The Knight and Death," and "Melancholy," the hour-glass there represented displays a dial (of different shape in each instance, a circle in one, a quadrant in the other) fixed upon its top, and marking the hours by the revolution of a hand. This result could only be attained by the contrivance just noticed; and it is allowable to conjecture that the notion was borrowed from the ancient water-clock. At what precise time the classic timekeeper became obsolete cannot now be ascertained; but a water-clock is specified amongst the presents sent by Haroun-al-Raschid to Charlemagne, early in the ninth century.⁵

Yet further, the Romans had already "given Time a voice," to make them take note of his loss; for, though Petronius makes the millionaire Trinalchio keep a trumpeter who by his *hourly* blast apprizes him "how much of his life is spent," and warns him to make the most of the remainder (which could not have been done without some exact mode of marking the time being accessible to this human bell), yet, in the next century, Lucian, amongst the numerous conveniences of certain newly-built baths, describes a *horologium* that proclaimed the hour *διὰ μικήματος*,—by means of a roaring sound.⁶ This sound was doubtless produced by hydraulic pressure upon the air contained in a cupola with pipes attached, according to the plan so skilfully elaborated by the Romans of the Decline in their *hydraulis* or water-organ. The principle of the latter was exactly that of the steam whistle, water-pressure being substituted for that of heated vapour, and the confined air driven into a

⁵ A.D. 807. "Horologium ex aurichalco arte mechanica mirifice compositum, in quo duodecim horarum cursus ad clepsydrum vertebatur, cum totidem æreis pilulis quæ ad completionem horarum decidebant, et casu suo subiectum sibi cymbalum tinnire facie-

bant." Eginhard, Ann. Franc. In the Chronicon Turonense it is stated that the hours were marked not only by a sound (*cymbalo*) but by twelve horsemen issuing from windows.

⁶ Lucian, Hippias, 8.

vast brazen cylinder or *turris* by means of forcing-pumps (worked sometimes by seventy men at once) was allowed to escape through valves placed in pipes arranged above, and regulated by keys worked by the performer.

It will hence be seen how Lucian's *horologium* might have made its voice audible to as great a distance as the modern giant whose whistle so perpetually assails our ears.

The name *horologium* seems to have been given to the *clepsydra*, or "lose-water," after the improvements in the latter enabled it to tell the time. The same term is used for that other most ancient indicator, the sun-dial. This originally was no more than a column, the shadow of which by the variations in its length marked the hour. Aristophanes speaks of its being dinner time when the shadow of this gnomon, which he terms *στοιχείον*, waxed ten feet long. Augustus, says Pliny, converted an Egyptian obelisk (that now serving the same purpose in Rome, on the Monte Citorio) into a gigantic gnomon in front of his Mausoleum in the Campus Martius. Pliny notices that in his day it had ceased to mark the hour correctly, either through "some change in the solar orbit," or the settlement of its own foundations, in spite of the vast depth (equal to the height of the obelisk) at which they had been laid by the emperor's architect.⁷

Vitruvius assigns to Berosus the Chaldean the invention of the concave sun-dial (the usual form with the ancients), the "hemicyclium excavatum ex quadrato;" to Aristarchus of Samos, the convex kind, the "hemispherium," and also the horizontal dial; to Scopinas of Syracuse, the vertical, "plinthus, lacunar," one of which was set up in the Circus Flaminius; to Theodorus, that for all latitudes, *πρὸς πᾶν κλίμα*, an invention implying an extraordinary proficiency in the science.⁸

⁷ Pliny, *Hist. Nat.*, lib. xxxvi. c. 10.

⁸ Vitruvius, lib. ix. c. ix.