

in sight, an incredible exhortation to the rowers and rivalry took place. The ships of the barbarians indeed went faster, because for a length of time they had been accustomed to the handling of the oars; but the ships of the Greeks preceded them by a small interval; and, having finished their voyage as quickly as possible, they immediately sprang upon the strand like wrestlers; and, indeed, the leading ships of the Carthaginians attacked the after-most ships of Agathocles, having come within range of missiles."

—DIOD. SIC., lib. xx., ch. 5, 6.
 'Ο δ' Ἀγαθοκλῆς περικατάληπτος ἦδη γενόμενος, ἐπιλαβοῦσθαι τῆς νύκτος, ἐνεκλήσθαι τὴν ἑστῆσαν ἔτυχε. Τῆ δὲ δεύτερα τῆ λικαυτῆν ἐκλειψῆν ἦλθον συνέβη γενέσθαι, ὥστε ὀλοχερῶς φαινῆναι νύκτα, θεωρωμένων τῶν ἀστέρων παντοχοῦ. . . Ἐξ δ' ἡμέρας καὶ τὰς ἴσας νύκτας αὐτῶν πλεισάντων, ἀποφαινούσης τῆς ἑω ἑω, παραδόξως ὁ στόλος τῶν Καρχηδονίων οὐκ ἄποθεν ὦν ἐωράθη.—DIOD. SIC., Lib. xx., ch. 5, 6.

From this narrative it can be clearly shown that Prof. Newcomb is mistaken when he says that "we do not know on which side of Sicily he sailed." It is quite certain that the eclipse occurred before the expedition had weathered the promontory of Pachynus, or had made any sensible westing in their voyage.

The total distance, on a coasting voyage from Syracuse to Carthage, is 350 English miles, and the distance from Syracuse to Cape Pachynus is forty miles. Now, the whole time of the voyage was six days and as many nights, together with a portion of a night at Syracuse, and a portion of a day near Carthage (the stone quarries). Allowing six hours each to these, we have :—

	Hours.
Part of night of outset at Syracuse	6
Six days and as many nights	144
Part of day near Carthage before landing at the "Stone Quarries"	6
	156

This is the minimum time allowable from the narrative, and any longer time allowed will strengthen my argument. The rate of rowing during the voyage was, therefore,

$$\frac{350}{156} = 2.25 \text{ miles per hour.}$$

At this rate of rowing it would require 17h. 48m. to reach Cape Pachynus, a distance of forty miles; so that if the expedition sailed at midnight, it would have been off Pachynus, to the eastward, at 5 P.M., which is the time assigned by Petavius for the middle of the eclipse (Syracusan time). It is, therefore, perfectly clear that if the expedition had got so far to the westward as to allow of the coefficient (6.11), the eclipse must be thrown into the wrong day, which is inadmissible.

If Delaunay is to be trusted, the expedition must have gone out of the Mediterranean into the Atlantic before the coefficient 6.11 could be verified. He says :—"Nous avons dit que la durée du jour augmentait d'une seconde dans l'espace de 100,000 ans. Mais cela se produit progressivement, de telle manière que ces augmentations successives des jours s'ajoutent, et au bout d'un grand nombre de jours, font un total appréciable. Si on remonte à une époque, de 2400 ans époque à peu près, à laquelle on rapporte les éclipses historiques dont on a parlé, on voit que l'observation de l'une de ces éclipses a dû être faite 1^h $\frac{3}{4}$ plus tôt que si le ralentissement du mouvement de rotation de la terre n'avait pas existé.

"La variation relative aux anciennes éclipses va donc jusqu'à 1^h $\frac{3}{4}$. Ainsi une éclipse a été observée à un certain moment 1^h $\frac{3}{4}$ plus tôt qu'elle ne l'aurait été sans le ralentissement.

"Prenons les trois éclipses principales rapportées par l'histoire. Celle de Thalès, arrivée 585 ans avant J.—C., a été vue en Asie Mineure; sans le ralentissement du mouvement de rotation de la terre, on l'aurait vue dans l'île de Sardaigne.

"Celle de Darisse (557 ans avant J.—C.) a été observée en Perse; on l'aurait vue dans la régence de Tripoli, sans le ralentissement.

"Enfin, celle d'Agathocle (310 ans avant J.—C.), signalée près de Syracuse, aurait dû se montrer près de Cadix."¹

STRIDULATING ORGANS IN SCORPIONS

AT the September meeting of the London Entomological Society, Mr. J. Wood-Mason announced the discovery of tridulating organs in scorpions. While recently working at the

¹ "Cadix," pp. 18, 19.

anatomy of a species allied to *S. afer*, he had met with structures which, from his familiarity with the analogous ones in other arthropods, crustaceans as well as insects, he had at once without hesitation determined to be sound-producing apparatus—even before he had found that sounds could be produced by them artificially by rubbing the parts together or accidentally in the mere handling of alcoholic specimens. He had, however, been enabled to place the matter beyond all doubt, for while at Bombay waiting for the steamer, he had obtained, by a happy chance, from some Hindustani conjurers, two large living scorpions belonging to another species of the same type; these, when fixed face to face on a light metal table and goaded into fury, at once commenced to beat the air with their palps and simultaneously to emit sounds which were most distinctly audible not only to himself, but also to the bystanders, above the clatter made by the animals in their efforts to get free, and which resembled the noise produced by continuously scraping a piece of silk woven fabric, or, better still, a stiff tooth-brush with one's finger-nails. The species—a gigantic one from the Upper Godavari district—in which he had first observed stridulating organs, had these organs more highly developed than in the one experimented upon at Bombay, and must stridulate far more loudly, for by artificially rubbing the parts together in a dead alcoholic specimen he could produce a sound almost as loud as, and very closely similar to, that made by briskly and continuously drawing the tip of the index-finger backwards and forwards in a direction transverse to its coarse ridges, over the ends of the teeth of a very fine-toothed comb. The apparatus, which, as in the *Mygale*, is developed on each side of the body, was situated—the scraper upon the flat outer face of the basal joint of the palp-fingers; the rasp on the equally flat and produced inner face of the corresponding joint of the first pair of legs. On separating these appendages from one another, a slightly raised and well-defined large oval area of lighter coloration than the surrounding chitine was to be seen at the very base of the basal joint of each; these areas constituted respectively the scraper and the rasp; the former was tolerably thickly but regularly beset with stout, conical, sharp spinules curved like a tiger's canine, only more towards the points, some of which terminate in a long limp hair; the latter crowdedly studded with minute tubercles shaped like the tops of mushrooms. He had met with no stridulating organs in this position in any scorpions besides *S. afer* and its allies; but in searching for them in other groups he had come to the conclusion that the very peculiar armature of the trenchant edges of the palp-fingers in all the *Androctonoidæ*, and in some at any rate of the *Pandinoideæ* (no *Telegonoidæ* or *V. jovoideæ* had yet been examined), was nothing but a modification for the same purpose, for the movable finger of this pair of appendages when in the closest relation of apposition to its immovable fellow could most easily be made to grate upon it from side to side so as to produce a most distinct crepitating sound; but when separated from it ever so little appeared to be incapable of the slightest lateral movement. It was his intention on his return to India to endeavour to determine this question, as well as many others relative to the species in which the presence of sound-producing apparatus had now been demonstrated by careful observation and experiment upon living animals.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—Mr. Thomas Whittaker, from the Royal College of Science, Dublin, has been elected to a Natural Science Scholarship at Exeter College.

At Jesus College the following elections to Welsh scholarships have been made :—In mathematics, Mr. David Davies, from the College, Llandoverly; in science, Mr. William Williams, from Dolgelly Grammar School.

The Commissioners commenced their sittings at the Clarendon Hotel on Monday. The proceedings of the Commissioners were of a formal character, but Tuesday, it was understood, they would proceed to take evidence.

CAMBRIDGE.—The master and seniors of Gonville and Caius College will proceed in December to elect a prælector in chemistry, in succession to the late Mr. Richard Apjohn. The duties of the prælector will be to take charge of the college laboratory, to prosecute original research, to instruct in chemis-