by its date (1665) and by the fact that all except the first word really constitutes a subtitle. The British Association committee alludes to a title of recent date containing ninety-one words. Mr. Wilder's precepts are admirable, but the heading of this letter shows how even his example may be bettered. A certain leading society persists in prefixing the useless 'on,' and forces an author to entitle his paper 'On the Tears of the Crocodile' instead of 'Crocodile's Tears.'

Clearness.—Modesty, Mr. Wilder would suggest, made an author say, 'Some Contributions to our Knowledge of the Morphology of the Guyascutidæ,' instead of 'Guyascutid Morphology,' and that same modesty, presumably, forbade him to suppose that the casual biologist might not know what a guyascutid was, and made him keep to himself the precise nature of his contributions. The enormous number of generic names and their synonyms often makes it impossible for a reader to tell the subject of a paper from its title. A specialist on echinoderms turned out at night to hear a paper 'On the Structure of *Apiocystis,*' only to find that it was an alga (if my memory serves) and not the Silurian fossil of that name. When a paper was published on the fluid of the body cavity in a certain animal the whole staff of the largest natural-history museum was unable to say what kind of animal was meant. In such cases the explanatory word may lengthen the title, but it is fully worth the space. Mr. Knowlton's examples of ambiguity are not so bad as these, but bad enough. Even the best of them is not really free from doubt; for example, what would an American botanist understand by 'The Flora of the Coal Measures. An Ecological Study'? This reminds me that a geological bibliographer innocently placed in his slip-catalogue the title of a work on 'Anthracite Coal Communities.' He has since learned that this too is an 'Ecological' study, neither geological, nor paleontological, nor zoological, nor botanical.

In fine, let the man of words, whether modest or 'intoxicated with the exuberance of his own verbosity,' remember that 'Brevity is the soul of wit,' and let the epigrammatist make for himself no occasion to say, 'Brevis esse laboro, obscurus fio.' F. A. B.

MARGINAL AND RIDGE SCALES IN CEPHALASPIS AND DREPANASPIS.

IN two or three of his recent articles on *Trematapis,* Dr. William Patten has affirmed his belief, contrary to that of all other writers, in the existence of 'numerous pairs of jointed oar-like appendages' in certain fossil ostracophores. His latest paper, in the December number of the *American Naturalist,** is noteworthy for its development of the thesis previously advanced by him to the effect that *Cephalaspis* is provided with a 'fringe of jointed and movable appendages (25–30 pairs) along the ventral margin of the trunk.'

Happily, the author does not postulate the existence of imaginary organs, as was done in the case of *Trematapis;* but this time actual, definite structures are pointed out, familiar to every one as marginal scales, and these receive the new name of 'fringing processes,' and are interpreted as appendages. Regarding these structures Dr. Patten states that 'there is little doubt that they are the antecedents of the lateral fold of vertebrates,' although in another paragraph it is remarked that 'whatever their significance may be, there is apparently nothing known in true fishes that is exactly comparable with them.'

The present writer can not agree with his esteemed friend that these marginal scales, as they are commonly called, are not precisely what their name implies, and fails to see anything remarkable about them, either in form, in attachment or in position. Dr. Patten is quite right in observing that they are marked with the same surface ornamentation as trunk scales, nor do they differ from the latter in any other respect except that their extremities are free. The identical structures, if occurring in the median line above or below, would be pronounced *ridge scales;* if along the fin margins, they would pass for *fulcra;* if along the angles of modern flat-bottomed fishes, for *marginal* or *lateral scutes.* It may be, in fact, regarded as a general

* 'On the Structure of the Pteraspidæ and Cephalaspidæ,' pp. 827–865.

tendency amongst both vertebrates and invertebrates with a flattened ventral surface to have the lateral or pleural margins produced into processes of some sort. *Cephalaspis* is but one of numerous instances that might be mentioned amongst fishes, and illustrations abound amongst trilobites and various lower invertebrates.

The paired condition of the marginal scales in *Cephalaspis* is without significance, being a necessary accompaniment of the flattened ventral surface. Were the body laterally compressed, we should probably find but a single row of median scutes, as in *Lasanius* and *Birkenia,* although even in the latter genus Dr. Traquair is of the opinion that they are paired. Fulcra, also, are often paired; and it must be remembered that even a typically unpaired structure like the anal fin may occasionally appear as double. That the structures called 'fringing processes' by Dr. Patten can be looked upon in the nature of appendages has been emphatically denied by Dr. Gaskell,* who has studied the actual specimens upon which our Dartmouth friend bases his conclusions. Jaekel, of Berlin, likewise fails to see that there is any evidence of appendages in these forms.† Hence it would appear that paleontologists are not unanimously in favor of deriving the lateral fold of vertebrates from marginal scales such as occur in *Cephalaspis*.

Drepanaspis.—For our knowledge of the organization of *Drepanaspis,* one of the most interesting Paleozic fishes brought to light within recent years, we are indebted almost exclusively to the dean of British paleichthyologists, Dr. R. H. Traquair. In an appreciative review of Traquair's recent memoir on the 'Lower Devonian Fishes of Gemünden,' published in no. 471 of this journal,‡ Dr. Bashford Dean takes issue with the original author regarding the orientation of the creature. It is stated by Dean that Traquair's reasons 'seem inadequate for distinguishing dorsal and ventral sides. In no specimen figured is the relation of the dorsal lobe of the tail shown convincingly to be continuous with the so-called dorsal aspect.'

Whatever may be thought of Traquair's figures, although his plate 2 seems to us conclusive enough, there can be no question about the originals, and those who have examined them attentively are compelled to admit the correctness of the Scottish author's interpretations. The dorsal ridge scales are larger than the ventral, and form a more extended series, beginning further forward and continuing further back than the ventral fulcra. Several specimens in the Edinburgh Museum have been pointed out to the present writer by Dr. Traquair in which this row of prominent ridge scales can be traced continuously from a point shortly behind the median dorsal plate to the tip of the dorsal lobe of the tail. The extent to which the caudal lobes are covered with fulcra is well shown in Pl. 4 and Pl. 1, Fig. 1, of the memoir in question, and their connection with upper and lower systems of body plates appears tolerably distinct.

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* *Journ. Anat. and Phys.*, Vol. 37, p. 198, 1903.

† *Zeitschr. deutsch. geol. Ges.*, Vol. 55, p. 84, 1903.

‡ Science, Vol. 19, p. 64, 1904.

SPECIAL ARTICLES.

ON THE FEASIBILITY OF MEASURING TIDES AND CURRENTS AT SEA.

The importance of measuring the rise and fall of the tide, and especially the direction and velocity of the current at points more or less remote from land, is obvious to any one. The following brief discussion of a few questions involved seems to show that such measurements, although rather costly, can probably be made in almost any body of water whose surface at times becomes reasonably calm; at any rate, it should generally be possible to measure the current.

It is here proposed to make use of a species of piano-wire sounding apparatus, in which the 'lead' consists of a large stone, or of a bag or box containing stones, which is attached to the sounding wire by means of a string or a finer wire. This weight when once cast is to remain immovable on the bottom and is not to be recovered. The wire drawn taut serves to indicate when the vessel