

Panama, which appears to have been previously undescribed.

The first part of the second volume of the Memoirs of the Indian Museum is devoted to the initial portion of a report, by Dr. N. Annandale, on the fishes taken by the Bengal fisheries steamer *Golden Crown*; this section, which is illustrated with five plates, dealing with the skates, rays, and sawfishes. In the group of sting-rays and butterfly-rays, new species of the genera *Trygon* and *Urogymnus* are described and named, while in the torpedo-rays, in addition to a new species of *Narcine*, Dr. Annandale proposes the unclassical term "Bengalichthys" for a ray distinguished from *Astrape* by its thickened and fleshy disc, rudimentary pectoral fins, and degenerate eyes.

A second new genus of rays, *Dactylobatus*, has recently been proposed by Messrs. B. A. Bean and A. C. Weed in No. 1682 of the Proceedings of the U.S. National Museum for a species of which two examples were taken off South Carolina nearly a quarter of a century ago. The generic name refers to the presence of a finger-like process jutting from the middle of each pectoral fin, which, together with the subcircular form of the disc, distinguishes this handsomely spotted species from the typical rays of the genus *Raia*.

In No. 1677 of the publication last quoted Messrs. D. S. Jordan and J. O. Snyder describe, under the name of *Coregonus oregonius*, a new "white-fish" from the McKenzie River, Oregon, where it is locally known as the "chisel-mouth Jack." It is an active, predaceous fish about 18 inches in length; which takes the fly readily.

To the June number of the *Zoologist* Mr. R. Elmhirst, superintendent of the Marine Biological Station at Millport, communicates a note on whelks as cod-food. Cod, it is well known, feed chiefly on crustaceans, but two cases are on record where large numbers of whelks were taken from the stomachs of these fishes. Now, although these molluscs, generally with the operculum cut off, are frequently used as bait in cod-fishing, the number of whelks with their operculum in the two instances mentioned indicates that these had not been taken on lines, but devoured in the course of natural feeding. The author is of opinion that cod seize whelks when the foot is protruded, and swallow this part alone, rejecting the shell and its contents by means of a vigorous shake.

In the same issue Mr. L. E. Adams gives some additional notes on the flying-fish problem, in the course of which it is suggested that the discrepancy between the accounts of different observers with regard to the occurrence of wing-vibration may be due to the "personal equation" in the matter of vision-power.

PRIMITIVE DIPROTODONTS.

AT last, it seems, the true position of *Plagiaulax*, of the Dorsetshire Purbeck, described by Hugh Falconer in 1857, has been more or less definitely determined, and this by means of its early Tertiary American relative *Ptilodus*, of which remains, in a much more satisfactory condition than any hitherto known, have recently been discovered in Montana. These are described by Mr. J. W. Gidley in No. 1689 (vol. xxxvi., pp. 611-26) of the U.S. National Museum Proceedings under the name of *P. gracilis*. Of late years *Plagiaulax* and *Ptilodus*, together with a number of more or less nearly allied types, collectively forming the *Multituberculata* or *Allotheria*, have been tentatively associated with the *Metatheria* on account of a presumed resemblance of their cheek-teeth to those of the platypus. A study of the skull, pelvis, and limb-bones of the American genus has, however, convinced Mr. Gidley that this is wrong, and that the *Plagiaulacidae* (together with the other *Multituberculata*) are really marsupials. The unequal development of the fore and hind limbs, the characters of the incisors, the form of the palate, and the position of the cheek-teeth indicate, in his opinion, a close, although not ancestral, relationship with the diprotodont marsupials.

This is practically a confirmation of the original view of Falconer, who regarded *Plagiaulax* as related to *Hypsiprymnodon* (*Potorus*). Cope (who was followed by Mr. Lydekker on p. 195 of the fifth volume of the "Catalogue

of Fossil Mammalia in the British Museum") endorsed, in a somewhat modified manner, this opinion, regarding the *Multituberculata* as primitive diprotodonts presenting some very specialised features. In the course of his investigation Mr. Gidley has been led to conclude that *Bolodon* of the English Purbeck is inseparable from *Plagiaulax*, while the American *Chirox* is identical with *Ptilodus*.

The dental formula of *Ptilodus* is $i. \frac{1}{1}, c. \frac{0}{0}, p. \frac{4}{3}, m. \frac{2}{2}$. The lower jaw is attached obliquely to the skull in such a manner that its condyle is raised above the line of the cheek-teeth (thereby doing away with an objection raised by Owen against the herbivorous nature of *Plagiaulax*), and the greater portion of the large cutting lower premolar does not, in consequence, bite against the upper cheek-teeth, which extend considerably in advance of the same. Mr. Gidley's views, especially if the Triassic *Microlestes* (a name which it has recently been proposed to replace by *Thomasia*) belong to the same group as *Plagiaulax*, will considerably modify opinion with regard to the origin and radiation of the diprotodonts.

PROBLEMS OF AVIATION.

THE interim report of the Advisory Committee for Aeronautics, which, in his recent speech in the House of Commons, Mr. Haldane promised shortly, has now been published (Cd. 4711). It will be remembered that the duty of the committee is to advise on questions submitted to it by the Government departments to which the work of constructing and experimenting with aeroplanes and dirigibles has been entrusted. This work necessitates, in some cases, experimental research at the National Physical Laboratory. The committee is intended generally to advance the applications of the science of aeronautics by such means as may seem best. It has arranged already for a series of reports as to the present state of knowledge on the questions which will have to be considered. These reports are to include papers on the following subjects:—Mr. A. Mallock, on general questions to be studied; Dr. T. E. Stanton, on recent researches on the forces on plane surfaces in a uniform current of air; Sir G. Greenhill, on stability and on the screw propeller; Dr. W. N. Shaw, on wind structure, dealing especially with the phenomena of gusts, and on the variation of wind velocity with height; Mr. F. W. Lanchester, on petrol motors for aeronautical purposes; Dr. W. Rosenhain, on light alloys; and the secretary (Mr. F. J. Selby), on existing knowledge on the subject of the accumulation of electrostatic charges on balloons, and the precautions to be adopted to avoid the dangers arising therefrom.

To make it possible to decide what work should be undertaken first at the National Physical Laboratory, the committee drew up a list of desirable experiments as follows:—

I.—General Questions in Aërodynamics.

- (1) Determination of the vertical and horizontal components of the force on inclined planes in a horizontal current of air, especially for small angles of inclination to the current.
- (2) Determination of surface friction on plates exposed to a current of air.
- (3) Centre of pressure for inclined planes.
- (4) Distribution of pressure on inclined planes.
- (5) Pressure components, distribution of pressure and centre of pressure for curved surfaces of various forms.
- (6) Resistance to motion of bodies of different shapes; long and short cylinders, &c.
- (7) Combinations of planes; effect on pressure components of various arrangements of two or more planes.

II.—Questions Especially Relating to Aeroplanes.

- (8) Resistance components for aeroplane models.
- (9) Resistance of struts and connections.
- (10) Resistance of different stabilising planes, both horizontal and vertical.
- (11) Problems connected with stability:—(i.) mathematical investigation of stability; (ii.) the stability of aero curves of different section and of different plan (Turnbull's experiments); (iii.) effect of stabilising planes and investiga-