ι Ungulata—

Hippopotamus ......

Pig family (Suidac) .....

Camel . 1∙1,3∙3

C · · ' 3.I.2.3

Chevrotain (Tragulidae) ....

Deer family (Cervidae) ....

**3\*1∙\*5\*o**

**• · 00 ‰3**

Hollow-horned ruminants (Bovidae) . . '

**3∙ \*,∙3∙O \*** Tapir 3⅛⅛

Horse (Equidae) ...... Rhinoceros ~~..... j°~~~~~2~~~~ι''7'^~⅜—~~

(o-ι).(o-ι).4∙3

Procavia (Hyrax) .... (1-2) .0.4.3

2.0.4.3

Elephant . . . d.i. ι.i, ι.c.o.d.m. (3~⅜)m.3

*000* (3=4> 3

In this animal there are no premolars, but the milk molars (d.m) and true molars gradually replace one another from before back­ward throughout life, so that there are never more than two back teeth in each segment of the jaw at any one time.

*Rodentta—*

Typical rodents (Simplicidcntata) . . i∙0∙.⅛7i)∙3

l.0.(0-ι).3

Hares and rabbits (Duplicidentata) . . -∙o∙3∙3

1.0.2.3 *Cetacea.—*In the living t∞thed whales (Odontoceti) the denti­tion is homodont and may be as great as — There is

**60**

every reason to believe, however, that they are derived from heterodont ancestors. In the whalebone whales (Mystacoceti) the teeth are replaced by the whalebone in the adult, but in the embryo slightly calcified teeth are present which are afterwards absorbed.

The homodont dentition of the whales is a retrograde process, and is therefore not comparable to the homodont dentition of the vertebrates below mammals.

*Sirenia.*—The dentition is monophyodont. The manatee has

i. -, c. -, back teeth —∙

**20 II**

In the Edentata the ant-eaters (Myrmecophagidae) and pangolins (Manidae) are toothless, though the latter have foetal tooth germs. The aard varks (Orycteropodidae) are somewhat heterodont, while the armadillos (Dasypodidae) and sloths (Bradypodidae) have a homodont dentition, which, like that of the whales, is retrogres­sive. In the giant armadillo *(Priodon gigas)* the formula is 25/25. This animal therefore has a hundred teeth. In none of the Edentata are the teeth covered with enamel.

In the Marsupialia the typical formula is They are

divided into *diprotodont,* in which there arc not more than 3/3 incisors, often 3/1 as in kangaroos, and *polyprotodont,* in which the incisors are more than 3/3 as in the Tasmanian wolf (Thylacinus) and Tas­manian devil (Sarcophilus). The marsupial teeth are often re­garded as all milk teeth, yet the order is not really monophyodont because the germs of the permanent teeth are formed and aborted. Modern research, however, casts grave doubt on the accuracy of this view.

In the Monotremata the Echidna or spiny ant-eater is quite edentulous, while the duck-mole (Ornithorhynchus) has functional molar teeth in youth, though in the adult these are lost, and their place is taken by horny plates.

Reviewing the various tooth formulae of mammals the following is usually regarded as typical :—

3∙1∙4∙3 3∙1∙4∙3

This, it will be noticed, is the formula of the pig, and it is also that of almost all the Eocene Ungulata. Although the majority of mammals are diρhyodont, or, in other words, the working teeth belong to two dentitions, evidences have lately been submitted of vestiges of two other series, one on the labial side of the milk teeth and one on the lingual side of the permanent series. If these are substantiated there would be four dentitions—(1) pre­milk; (2) milk; (3) permanent; (4) post-permanent. The theory, though it bridges over the gap between the polyphyodont lower vertebrates and the apparently diphyodont mammals, is not by any means established. As the teeth are of such importance in the classification of animals, it will save continually repeated explanations in other articles if some of the chief terms by which they are described are recapitulated and briefly defined here.

1. *Acrodont,* a tooth which is anchylosed by its base to the summit of a parapet on the jaw.

2. *Bilophodont,* a molar tooth having two transverse ridges on its grinding surface, as in the tapir.

3. *Brachyodont,* a low-crowned molar tooth—the opposite of hypsodont.

4. *Bunodont,* a tooth bearing conical cusps.

5. *Diphyodont,* having two series of teeth (milk and permanent).

6. *Diprotodont,* a marsupial with not more than 3/3 incisors, often only one on each side of the mandible.

7. *Haplodont,* a tooth having a simple conical crown with a single root.

8. *Heterodont,* a dentition in which the teeth are not all alike, chiefly characteristic of the Mammalia.

9. *Homodont,* a dentition in which the teeth are all alike as in many of the lower vertebrates and some mammals.

10. *Hypsodont,* a high-crowned molar tooth, such as that of the horse,—the opposite to brachydont.

11. *Lophodont,* a transversely ridged molar tooth; cf. bilopho­dont.

12. *Monophyodont,* having only one dentition (cf. diphy- and polyphy-odont).

13. *Multituberculate,* a tooth, the crown of which bears numerous conical cusps; held by some to be the primitive condition of the mammalian teeth.

14. *Pleurodont,* a tooth anchylosed to the inner side of a parapet on the jaw.

15. *Polybunodont,* a synonym for multituberculate.

16. *Polyphyodont,* having an endless succession of teeth, as in most vertebrates below the mammals.

17. *Polyprotodont,* a marsupial having an incisor formula of more than 3/3.

18. *Protodont,* a stage met with in fossil mammals which is an advance on the haplodont tooth in that two small cusps are added to the main cone.

19. *Secodont,* a back tooth adapted to cutting as in many of the Carnivora.

20. *Selenodont,* a molar tooth with crescentic ridges on its grind­ing surface as in most ruminants.

21. *Thecodont,* a tooth embedded in a socket or alveolus, as in mammals.

22. *Triconodont,* a fossil stage in advance of the protodont, There are three well-marked cones in an antero-posterior line.

23. *Tritubercular,* a fossil stage succeeding the triconodont. The

main cone is external in the lower teeth and internal in the upper. A very common form of back tooth in fossil forms and one which gives its name to the “ tritubercular theory.” (F. G. P.)

**TEETOTALISM,** the practice of total abstinence from all intoxicating liquors, hence that form of the temperance move­ment of which the basis is the “ pledge ” to abstain from all intoxicating liquors (see Temperance). There seems no doubt that the word, whatever its actual origin, is a strengthened form of “ total,” probably influenced by “ teetotum ” *(q.v.).* Ac­cording to the *Century Dictionary,* the secretary of a New York temperance society introduced a total abstinence pledge among its members, who were thus divided into those who had taken the old pledge, the O.P.’s, to abstain from spirituous liquors, and the T.’s, who had taken the new or total pledge. The English version, taken from the account by Joseph Livesey in the *Staunch Teetotaler,* January 1867, is that one Richard Turner, a Preston artisan and popular temperance speaker, declared at a meeting about 1833, that “ nothing but tee-tee­total would do.” This repetition of the initial letter does not appear to have been due to his stammering but to have been a mere emphasis on the word. The expression seems to have obtained instant recognition and popularity. Both versions are apparently authentic, and there seems no reason to suppose that they are not independent.

**TEETOTUM,** a form of top, used in various games of chance; the body is of polygonal shape, marked with letters or numbers, which decide the result of the game, according to the side which