

The order *Proboscidea* is now only represented by the elephants. The order is characterised by the total absence of canine teeth; the molar teeth are few in number, large, and transversely ridged or tuberculate; incisors are always present, and grow from persisting pulps, constituting long tusks. In existing species these tusks only occur in the upper jaw, the lower being destitute of incisors. The nose is prolonged into a cylindrical trunk, movable in every direction, highly sensitive, and terminating in a finger-like prehensile lobe. The nostrils are placed at the extremity of the proboscis. The feet are furnished with five toes each, and with a thick pad of integument; there are no clavicles; and the teats, two in number, are placed upon the chest.

Only two living species of elephants are known: the Asiatic (*Elephas Indicus*) and the African (*E. Africanus*). In the Indian and Ceylon elephant the males alone have well-developed tusks, but both sexes have tusks in the African species, those of the males being the largest. The Indian elephant is distinguished by its concave forehead, small ears, and the character of the molars. Its skull is pyramidal, and it has five hoofs on the fore feet and only four on the hind feet. The African elephant has a strongly convex forehead and great flapping ears. Its colour is darker, its skull is rounded, and it has four hoofs on the fore feet and only three on the hind. The elephant of the East is tolerably easily domesticated, and it is often used for performing heavy draught work, and even occasionally for ploughing. Elephant tusks yield a good deal of the ivory of commerce.

The *Carnivora* are distinguished by their canine teeth which are much larger and longer than the incisors and are well adapted for tearing flesh; the clavicles are either altogether wanting or merely rudimentary; the toes are provided with sharp carved claws; the teats are abdominal.

Section 1. *Pinnigrada* or *pinnipeda* comprises the seals and walruses, with their short legs expanded into broad webbed swimming paddles. Seals are largely captured for the sale of their blubber and skins; while the walrus is hunted by whalers, both for its blubber which yields an excellent oil, and for the ivory of the tusks.

Section 2. *Plantigrada* comprises the bear and its allies, in which the whole or nearly the whole of the foot is applied to the ground, so that the animals walk upon the soles of the feet. From the structure of the foot the *Plantigrada* have great power of rearing themselves upon their hind feet. They are comparatively slow of movement, and more or less nocturnal in habits. The claws are formed for digging, large, strong and curved, but not retractile; the tongue is smooth; the ears small, erect and round; the tail short; the nose forms a movable truncated snout; and the pupil is circular. Bears are hunted for the sake of their skins and fat.

Section 3. *Digitigrada*. This section comprises the lions, tigers, cats, dogs &c. in which the heel of the foot is raised off the ground, and the animal walks on the tips of the toes. The weasel, pole cat (*Putorius foetidus*) and ferret are the best known of the *Mustelidæ*, being characterised by their short legs, worm-like bodies and peculiar gliding mode of progression. Nearly-allied is the ermine or stoat, and the sable. The *Mustelidæ* are of commercial importance as yielding beauti-

ful and highly-valued furs. Closely related to the above are the otters distinguished by their webbed feet adapted for swimming. Many of the otters yield valuable fur.

The family *Viverridæ* includes the civets and genettes.

The *Hyænidæ* are distinguished by having 4 toes on each foot, a rounded muzzle and rough tongue, and include the various species of *Hyæna*.

*Canidæ* comprises the dogs, wolves, foxes and jackals. They have pointed muzzles and smooth tongues. The fore feet have five toes each, the hind feet have only four.

*Felidæ* (or Cats tribe) comprises the most typical members of the whole order *carnivora*, such as lions, tigers, leopards, cats and panthers. They all walk upon the tips of their toes. The hind feet have four toes each, while the fore feet have five. All the toes are furnished with strong, curved repartite claws, which, when not in use are drawn within sheaths by the action of elastic ligaments, so as not to be unnecessarily blunted. The tongue is rough and the jaws short.

#### THE PREPARATION OF ESSENCES.

Among the many miscellaneous manufactures which are capable of being developed in the Island, the preparation of essences from the numerous aromatic shrubs and flowers found here, cannot but prove to be of great value and profit if properly taken in hand. Ceylon, no doubt, has been for a long time exporting two essential oils, viz., Cinnamon oil and Citronella oil. Both these industries have so far been almost over-done, and owing to the large output of the materials, prices have come down to such an extent as to hardly leave a sufficient margin of profit to manufacturers for the capital they invest and for the trouble and labour they undergo in the preparation of the articles. It is positively asserted in some quarters that the manufacture of Citronella oil would altogether cease to be a profitable industry according to the current prices obtainable for the article, were it not for the considerable adulteration of the essential oil which is almost openly resorted to now. The adulterant used being nothing less than petroleum, or kerosine oil, and in the proportion of almost one to one. The device was, no doubt, first resorted to by dishonest traders, and when it was found that detection of the adulteration was a matter of great difficulty, most of the traders and planters were obliged to resort to this unfair practice, solely owing to the falling off in prices. Sometime back, English chemists carried out certain investigations with a view to finding out an easy method of detection; however, they were not very successful, and it is feared that with very rare exceptions the practice of adulteration is still in vogue. It is a matter for regret that the growers cannot be made to combine in their own interests to discontinue a policy which, in itself, is sufficient to kill out the industry altogether. When dealers in Europe find it difficult to obtain the pure article from Ceylon, they would not only resort to other sources of supply, but would go so far as to seek for substitutes for the article. Even when the growers agree, the conditions of trade here are such that petty traders who supply

the contractors will have to be controlled in some way or other.

Among the species of plants obtainable in Ceylon which are likely to yield essences, the following may be mentioned:—Sweet flag, *Acorus Calamus* Sing. Wadakaha, a zingiberaceous plant growing in moist situations.

*Kæmpferia galanga* L., Sing. Hingura piyali, and probably other species of *Kæmpferia* such as *K. Pandurata*, S. Ambakaha and *K. Rotunda*, Sing. Yavakenda.

*Curcuma Zerumbet*, S. Harankaha and *C. Aromatica*, S. Dadakaha. All of the natural-order Scitamineæ, and yielding aromatic rhizomes. The flowers and rhizomes of *Alpinia galanga*, Kaluwala. The seeds of *Klattia cardamomum*, S. Ensal.

Of the grasses, the roots of the *Andropogon muricatus*, Kus Kus or Sin. Sevendara, and the leaves of many other species of the same genus, such as *A. nardus*, Sin. Pengiri; *A. schænathus* (geranium grass) and *A. Citratus* yield essential oils. Of the Labiatae order the leaves of *Ocimum canum*, S. Hintala; *O. sanctum*, S. Maduratala; *O. basilicum*; *O. grattisimum* and *O. adscendens*, *Plectranthus Zeylanicus*, S. Iriwariya; *Coleus aromaticus*, S. Kapparawallia; *Pogostemon hyneanus*, S. Koilankola; *Mentha sativa* and *M. Viridis* are prolific sources of essence. Among others we have the seeds of Aniseed, *Pimpinella anisum*; Cummin seed, *Cuminum cyminum*; Fennel seed, *Feniculum vulgare*; *Nigella sativa*, S. Kaludura and Coriander, *Coriander Sativum* and a host of others. Cloves, Nutmegs and Sandal-wood, the flowers of orange and myrtle, are common and well known. The methods of extraction of essence are almost simple in the extreme. There are three processes in vogue just now, viz., expression, distillation, and maceration.

W. A. D. S.

(To be continued.)

#### GENERAL ITEMS.

Dr. Watt in his Dictionary of Economic Products mentions that he has repeatedly observed milkmen in Eastern Bengal carrying milk to market with a few leaves of *Cocculus Villosus* and the spine-like leaf of the date-palm placed in the vessel, and that on enquiring he was told that these prevented the milk from going bad through heat and shaking. Dr. Watt further states that he suspects that the real object was to thicken the water-adulterated milk. It is now stated in one of the Agricultural Ledger series that the leaves of *Cocculus* as those of *Petalium Murex* are well known to have the power of "thickening water" as it is called, but the action on milk, if the above observation be confirmed, seems well worthy the attention of the chemist and of the dairy farmers. *Petalium* is reported to be more especially used to thicken butter milk. [*C. Macrocarpus* is the species of *Cocculus* indigenous to Ceylon but *Petalium Murex* (the Sinhalese et-nerenchi) is a common weed, and it would be well for all concerned to see that their milk is not artificially thickened by the wily milkman by means of these two plants.]

The Jute plant would appear to be particularly well suited to Queensland. A writer to the *Australian Agriculturist* says that at the end of six months Jute, as grown by him, reached 13 and 14 feet in height. It is doubtful whether even in the well-known Jute fields of Northern India this height is often attained, indeed the height of the Jute plant in these parts is not often more than 10 feet. Again, in Queensland the period of immersion is given as from 10 to 24 days, while in Bengal the period is usually about half, or less than half, of this.

