

which the third is ascertained by oxymuriatic gas. The sum of the second and third may be determined by oxymuriatic gas, and then the first absorbed by liquid potash. The first and third being thus known, the second may be inferred, though not removed alone.

The nature of the inflammable residuum is then learned by combustion, due regard being had to its specific gravity, and to the proportion which the carbonic acid formed bears to the oxygen consumed.

A table is given of the products of various gases, from several different species of coal; and a second table, of the specific gravities of these gases, with the quantities of carbonic acid formed from each, and the quantity of oxygen required for their combustion. It is observed generally, that in the distillation of all these substances, the gas received at the commencement of the process is the heaviest, that it requires the largest proportion of oxygen, and is fittest for the purpose of illumination.

*An Account of some Peculiarities in the anatomical Structure of the Wombat, with Observations on the female Organs of Generation.* By Everard Home, Esq. F.R.S. Read June 23, 1808. [*Phil. Trans.* 1808, p. 304.]

The author, having received a male wombat alive from one of the islands in Bass's Straits, had an opportunity of observing its habits in a domesticated state, and of examining the peculiarities of its internal formation after death, particularly the mechanism of the bones and muscles of its hind legs, which have not been described either by Geoffroy, in his account of its internal form, or by Cuvier, who has described several parts of its internal structure in his *Leçons d'Anatomie Comparée*. The stomach of the wombat resembles closely that of the beaver, and differs so much from that of the kangaroo, and other animals of the opossum tribe, that it forms an extraordinary peculiarity. An account of the dissection of a female wombat having been received from the late Mr. Bell, Surgeon to the Colony at New South Wales, Mr. Home has inserted Mr. Bell's description, with remarks especially on the state of the uterus, which was double, and impregnated on each side; that on the right side was as large as a pullet's egg. The os tinæ was filled with a thick gelatinous substance. When a longitudinal incision was made into its cavity, its coats were found lined with the same jelly, in the centre of which was an embryo wrapped up in very fine membranes, that appeared to have no connexion by vessels with either the uterus or the gelatinous matter.

These facts, says Mr. Home, throw considerable light on the mode of propagation of this very curious tribe of animals. They confirm, in the most satisfactory manner, the observations contained in a former paper on the kangaroo, which required further evidence, as the specimen on which the observations were made had been sent to England preserved in spirits, and the parts had become very indistinct, from being coagulated and long kept.

Since it seems thus established, that the fœtus is nourished without a placenta, the source of the gelatinous matter provided for its nourishment becomes a natural object of inquiry. In birds the albumen of the egg, which corresponds with this jelly, is formed in a tube called the oviduct, and the lateral canals, which open into the cavity of the uterus of the wombat and kangaroo near its neck, bear a strong resemblance in their form to the oviducts of birds; and in the kangaroo they were found, in the impregnated state, to be enlarged, and to have a very free communication with the uterus; circumstances which induce the author to believe their sole use is to form the jelly, and to deposit it in the uterus.

*On the Origin and Office of the Alburnum of Trees. In a Letter from Thomas Andrew Knight, Esq. F.R.S. to the Right Hon. Sir Joseph Banks, Bart. K.B. P.R.S. Read June 30, 1808. [Phil. Trans. 1808, p. 313.]*

Mr. Knight having, by his former experiments on this subject, established to his satisfaction that the bark of trees is not converted into alburnum, but that the alburnous matter is deposited by a fluid which descends from the leaves, and is subsequently secreted through the bark, proceeds to inquire into the origin and office of the alburnous tubes.

In the succulent shoot of the horse-chestnut it may be seen, that the alburnous tubes are arranged in ridges beneath the cortical vessels, and the number of these ridges at the base of each leaf corresponds with the number of apertures which pass from the leaf-stalk. The position and direction of these tubes have induced naturalists to consider them as passages through which the sap ascends; but Mr. Knight intends to show that they are reservoirs of fluid secreted by the bark, which they retain till it is absorbed by the surrounding cellular substance. Having ascertained, by injections, that the alburnous tubes which descend from the base of an annual shoot are confined to one side of the stem, and to the external annual layer of wood, Mr. Knight made deep incisions at the bases of many annual shoots of young trees, in such a manner as certainly to intercept all communication with the stem by means of the alburnous tubes; but the shoots lived, and in the succeeding spring grew with considerable vigour. In some small twigs, two incisions were made on opposite sides, one a few lines higher than the other, so that all the alburnous tubes might, in some part of their course, be interrupted; yet the sap continued to pass into the branches, and their buds unfolded in the succeeding spring.

All naturalists agree in stating that trees perspire most during summer, when the leaves have attained their full growth; but as the alburnous tubes at that time appear dry and filled with air, it is evident that the tubes do not convey the sap, but are intended to execute a different office.

But if the sap does not rise through the alburnous tubes, says