

products of hydrocarbons, but it was considered that these alcohols had been derived directly from the peroxides or from the esters² and not at all from a primary hydroxylation process.

The particular view that oxygen first enters the -CH group with its labile hydrogen, to form an alkyl hydrogen peroxide, was arrived at in 1926, after a consideration of the results obtained in a research on the slow oxidation of a large number of fuel vapours in air.³ Attempts to isolate organic peroxides were unsuccessful,⁴ but now, after five years, it has been discovered by Dumanois, Mondain-Monval, and Quinquin that alkyl hydrogen peroxides are present, not only in the combustion tube, but also in the petrol engine.⁵

An intensive study of the oxidation of ethane and methane in air with and without the addition of inhibitors, carried out by myself (an account of which has been submitted for publication), has provided further evidence in favour of the Engler-Bach peroxidation theory of combustion. The experiment of endeavouring to isolate the moloxide or the activated methyl hydrogen peroxide from methane has not been attempted, since it is considered that at the temperatures of the experiment, namely, above 600° C., any organic peroxide would have an extremely short life, and if any organic peroxide were isolated, then, as Staudinger points out, it would not be the primary one, but a derivative or degraded form of it. The peroxidation theory of combustion is not essentially based on the isolation and identification of organic peroxides, but rather on the characteristic behaviour of inhibitors and surfaces and on the phenomena of autoxidation and autocatalysis.

It would be interesting to know how Prof. Bone would explain by the hydroxylation theory the autoxidation of benzene vapour to phenol or of aniline vapour to tars at low temperatures, facts recorded in the literature of hydrocarbon combustion.⁶

E. MARDLES.

Imperial College of Science,
S.W.7.

¹ *Ber.* 53, 2192; 1920. A short bibliography of the subject of the oxidation of fuel vapours is given in *R. and M.* (Air Ministry), 1374; 1930.

² Grün, *Ber.* 53, 987; 1920; Kelber, *Ber.* 53, 1567; 1920.

³ Callendar and others, *Engineering, R. and M.* (Air Ministry), 1062; 1926.

⁴ Mardles, *J.C.S.*, 872; 1928.

⁵ *Comptes rendus*, 19, 158; 1931. *Ann. des Comb. Liquides*, 5, 915; 1930.

⁶ Mardles, *J.C.S.*, 872; 1928. Gill, Mardles, and Tett, *Trans. Far. Soc.*, 24, 574; 1928. Brunner, *Helvetica Chimica Acta*, 13, 197; 1930.

Œstrus-Producing Hormones.

RECENTLY, Doisy and his co-workers (1931) have reported the isolation from the urine of pregnancy of a crystalline substance possessing œstrus-producing activity, which is distinct from the active substance theelin, previously described by them. The latter substance, to which they gave the formula $C_{18}H_{21}(OH)_2$, was shortly afterwards isolated by one of us (Butenandt, 1929)¹ and by Dingemane and co-workers² (1930). It was shown afterwards (Butenandt, 1930) that this substance is represented by the formula $C_{18}H_{22}O_2$, and that it behaves either as a hydroxy ketone or as a dihydroxy alcohol.

There is no doubt that the second substance isolated by Doisy and his co-workers,³ to which they give the formula $C_{18}H_{21}(OH)_3$, is identical with that fully described earlier by one of us (Marrion, 1930)⁴. Although Prof. Doisy refers to the triol previously isolated, there is no suggestion in his papers that it had been characterised as a trihydroxy substance of the formula $C_{18}H_{21}(OH)_3$. His view that the substance described by one of us is a mixture of both active

substances is apparently based solely on a difference between the uncorrected melting points. The evidence of the analytical data, which clearly shows this supposition to be untenable, is ignored.

A year ago when the presence in urine of two distinct œstrin-producing substances was clear to us, we were considerably puzzled over the relationship between them. The suggestion was tentatively advanced (Marrion, 1930) that the substance $C_{18}H_{22}O_2$ on treatment with hot alkali took up the elements of water to form $C_{18}H_{24}O_3$. This supposition was afterwards shown to be incorrect (Butenandt, 1930), since the former substance proved to be unchanged by such treatment. At the same time it was shown that both substances occur together in urine, and that by distillation in a high vacuum with potassium bisulphate, $C_{18}H_{24}O_3$ could be converted into $C_{18}H_{22}O_2$. Prof. Doisy has made no adequate reference to this work, and has advanced the earlier view, which has been shown to be untenable.

G. F. MARRIAN.

A. BUTENANDT.

London and Göttingen,
July 23.

¹ Butenandt, *Naturwiss.*, 17, 879; 1929. *Deutsch. Med. Woch.*, 55, 2171; 1929. *Zeit. für physiol. Chem.*, 191, 140; 1930. *Abh. d. Ges. d. Wissensch. zu Göttingen*; 1931. *Math. phys. Kl. iii. Folge. Heft 2*.

² Dingemane et al., *Deutsch. Med. Woch.*, 56, 301; 1930.

³ Doisy et al., *Proc. Soc. Exp. Biol. Med.*, 28, 88; 1930. *J. Biol. Chem.*, 91, 641, 647, 653, 655; 1931.

⁴ Marrion, *Chem. and Ind.*, June 20; 1930. *Biochem. Jour.*, 24, 1021; 1930.

Segregation of Floral Characters in the Wild Oxlip.

DR. C. J. BOND¹ finds that in hybrids between the primrose (*Primula vulgaris*) and the cowslip (*Primula veris*) the earliest flowers were formed singly on long peduncles of the primrose type, while the later ones were arranged in the umbelliferous type as in the cowslip. He asks whether these two types of inflorescence are also found in the true oxlip (*Primula elatior*).

I have cultivated this latter plant, originally obtained from Cambridgeshire, for many years, and have never seen any of the plants producing flowers singly on peduncles as in the primrose. They were always produced on a common erect scape. In Switzerland, too, where I found them last May, this was the sole method of flower-bearing. This fact, therefore, would support the more generally held opinion that *Primula elatior* Jacq. is a true species and quite distinct from the hybrid between the primrose and cowslip, from which it differs in other characters also.

In hybrids of my own raising, between the primrose and the true oxlip (*Primula elatior*), I have, however, often noticed the phenomenon described by Dr. Bond for hybrids between primrose and cowslip. I have also seen the two types of flower-bearing in hybrids which I have raised from *Primula elatior* crossed with *Primula juliae*. In this case also the single pedunculate flowers preceded those borne on a common scape, which was usually comparatively short. It would appear, therefore, that in crossing some species of *Primula*, one of which produces its flowers singly and the other bearing numerous flowers on a common scape, neither type of inflorescence is completely dominant, but that both types may occur in succession. As this condition occurs also in the cultivated form known as Mrs. McGillivray, it would point to this plant being a hybrid, probably with *Primula juliae* as one of the parents.

F. E. WEISS.

Pittance Farm, near Cranleigh,
Surrey, July 27.

¹ NATURE, May 9, p. 708.