ployed in funeral rites and religious ceremonies ; compara­tively poor people often spend as much as 50 rupees on sandalwood for a single cremation. Until the middle of the 18th century India was the only source of sandal­wood. The discovery of a sandalwood in the islands of the Pacific led to a considerable trade of a somewhat piratical nature, resulting in difficulties with the natives, often ending in bloodshed, the celebrated missionary John Williams, amongst others, having fallen a victim to an indiscriminate retaliation by the natives on white men visiting the islands. The loss of life in this trade was at one time even greater than in that of whaling, with which it ranked as one of the most adventurous of callings. About the year 1810 as much as 400,000 dollars is said to have been received annually for sandalwood by Kamehameha, king of Hawaii. The trees consequently have become almost extinct in all the well-known islands, except New Caledonia, where the wood is now cultivated. Sandal­wood of inferior quality derived from *Fusanus acuminatus* was exported from south-west Australia in 1884 to the extent of 2620 tons, valued at an average of about £8 per ton, genuine sandalwood being worth in China from £12 to £40 per ton.

In India sandalwood is largely used in the manufacture of boxes, fans, and other ornamental articles of inlaid work, and to a limited extent in medicine as a domestic remedy for all kinds of pains and aches. The oil is largely used as a perfume, few native Indian attars or essential oils being free from admixture with it. In the form of powder or paste the wood is employed in the pigments used by the Brahmans for their distinguishing caste-marks.

During the last few years oil of sandalwood has largely replaced copaiba, both in the United Kingdom and on the Continent, in the treatment of various diseases of the mucous membrane. Three varieties are distinguished in trade—East-Indian, Macassar, and West-Indian. The first- named is derived from *S. album,* the second probably from another species of *Santalum,* and the third from a wood imported from Puerto Cabello in Venezuela. *Bucida capitata,* a Combretaceous plant, is known in the West Indies as sandalwood ; but the odour of the wood as well as of the oil, which is quite distinct from that of the true sandalwood, has more resemblance to that of a *Myroxylon.* Inferior qualities of the oil are said to be adulterated in Germany with the oil of red cedar wood *(Juniperus virginiana).*

In India sandalwood is produced in the dry tracts of country in Mysore and Coimbatore, north and north-west of the Nilgiri Hills, also farther eastward in the districts of Salem and North Arcot, where the tree grows from the sea-level up to an elevation of 3000 feet. In the first-named district the wood is a Government monopoly and can only be felled by the proper officers, this privilege having been retained since 1770, when it was conferred by treaty with Hyder Ali on the East India Company. The Mysore sandalwood is shipped from Mangalore to the extent of about 700 tons annually, valued at £27,000. In the Madras Presidency—although there is now no monopoly—sandalwood, by the careful management of the forest department, has been made to yield an increasing revenue to the Government, as much as 5471/2 tons having been furnished by the reserved forests in 1872-3. The tree is propagated by seeds, which, however, must be placed where they are intended to grow, since the seedlings will not bear trans­plantation, probably on account of deriving their nourishment parasitically by means of tuberous swellings attached to the roots of other plants. The trees are cut down when between eighteen and twenty-five years old, at which period they have attained their maturity, the trunks being then about one foot in diameter. The felling takes place at the end of the year, and the trunk is allowed to remain on the ground for several months, during which time the white ants eat away the valueless sapwood but leave the fragrant heartwood untouched. The heartwood is then sawn into billets about 2 or 21/2 feet long. These are afterwards more carefully trimmed at the forest depôts, and left to dry slowly in a close warehouse for some weeks, by which the odour is improved and

the tendency of the wood to split obviated. An annual auction of the wood takes place, at which merchants from all parts of India congregate. The largest pieces are chiefly exported to China, the small pieces to Arabia; and those of medium size are retained for use in India. China imported into the treaty ports 66,237 piculs (of 1331/3 lb) of sandalwood in 1872. As much as 700 tons are annu­ally imported into Bombay from the Malabar coast, of which about 450 tons are again exported. The oil, which is distilled chiefly at Mangalore from the roots and chips, is also imported into Bombay to the extent of 12,000 lb annually.

*Red Sandalwood,* known also as *Red Sanders Wood,* is the pro­duct of a small Leguminous tree, *Pterocarpus santalinus,* native of Southern India, Ceylon, and the Philippine Islands. The wood is obtained principally from Madras, in certain parts of which province it is regularly cultivated, coming into the market in the form of irregular billets of heartwood, 3 or 4 feet in length. A fresh surface of the wood has a rich deep red colour, which on exposure, however, assumes a dark brownish tint. Under the influence of alkaline solutions, alcohol, or strong acetic acid, red sandalwood yields up to 16 per cent. of a resinoid body, santalin or santalic acid C15H14O5 (?), which substance is the tinctorial principle of the wood. Santalin is quite insoluble in cold water; it neutralizes alkalies, and with them forms uncrystallizable salts. In its pure condition santalin forms minute prismatic crystals of a beautiful ruby colour. The wood also contains small proportions of colourless crystalline principles—santal, C8H6O3, and pterocarpin, C17H6O5—and of an amorphous body having the formula C17A18O6. In mediaeval times red sandalwood possessed a high reputation in medicine, and it was valued as a colouring ingredient in many dishes. Now it is a little used as a colouring agent in pharmacy, its principal application being in wool-dyeing and calico-printing. Several other species of *Pterocarpus,* notably *P. indicus,* contain the same dyeing principle and can be used as substitutes for red sandal­wood. The barwood and camwood of the Guinea Coast of Africa, presumably the produce of one tree, *Baphia nitida Pterocarpus angolensis* of Do Candolle), called santal rouge d’Afrique by the French, are also in all respects closely allied to the red sandalwood of Oriental countries.

See Seemann, *Flora Vitiensis.* pp. 210-215 ; *Pharm. Journ.* and *Trans.,* 1885-86; *Pharmacographia,* 2d ed , p. 599 ; Dymock, *Materia Medica of Western India,* p. 617; *Jour. Soc. Arts,* 1875, p. 641; Seemann, *Voyage of the “Herald,"* 1853, p. 83; Seemann, *Jour. Botany,* 1864, p. 218; Erskine, *Islands of the* *W*. *Pacific,* 1853, p. 143, 326, 390, and Appendix, p. 478, 486: Martin, *Natives of the Tonga Islands,* 1817, pp. 319-333; Birdwood, *Bombay Products,* p. 306; *Madras Jury Reports,* 1857; Hawkes, *Report on Oils of India,* p. 38.

SANDARACH is a resinous body obtained from the small Coniferous tree *Callitris quadrivalvis,* native of the north-west regions of Africa, and especially characteristic of the Atlas Mountains. The resin, which is procured as a natural exudation on the stems, and also obtained by making incisions in the bark of the trees, comes into commerce in the form of small round balls or elongated tears, transparent, and having a delicate yellow tinge. It is a little harder than mastic, for which it is sometimes substituted, and does not soften in the mouth like that resin ; but, being very brittle, it breaks with a clean glassy fracture. Sandarach has a faintly bitter resinous taste, and a pleasant balsamic odour. It consists of a mixture of three distinct resins, the first readily soluble in alcohol, constituting 67 per cent. of the mass, while the second dis­solves with more difficulty, and the third is soluble only in hot alcohol. Sandarach is imported chiefly from Mogador, and is an important ingredient in spirit varnishes. It is also used as incense, and by the Arabs medicinally as a remedy for diarrhoea. An analogous resin is procured in China from *Callitris sinensis,* and in South Australia, under the name of pine gum, from *C. Reissii.*

SANDBACH, a town and urban sanitary district of Cheshire, is situated on the Trent and Mersey Canal, and on the London and North-Western Railway, at the junc­tion for Northwich, 25 miles east-south-east of Chester and 5 north-east of Crewe. In the market-place are two ancient obelisks, dating, according to some, from the 7th century. The principal public buildings are the parish church of St Mary, in the Perpendicular style, w’ith a tower rebuilt 1847-9, the grammar school, the public reading rooms, and the town-hall. Anciently the town was celebrated for its ale. The principal industry was formerly silk throwsting, but this is now discontinued, and the inhabitants are chiefly employed in the salt-works and