however, to have become extinct in Europe before the Pleistocene period, as none of their bones or teeth have been found in any of the caves or alluvial deposits in which those of elephants, rhinoceroses, and hippopotamuses occur in abundance ; but in other regions their distribution at this age was far wider than at present, as they are known to have extended eastward to China *(T. sinensis,* Owen) and westwards over the greater part of the southern United States of America, from South Carolina to Cali­fornia. Lund also distinguished two species or varieties from the caves of Brazil. Thus we have no difficulty in tracing the common origin in the Miocene tapirs of Europe of the now widely separated American and Asiatic species. It is, moreover, interesting to observe how very slight an amount of variation has taken place in forms isolated during such an enormous period of time. (w. H. F.)

TAR is a product of the destructive distillation of organic substances. It is a highly complex material, vary­ing in its composition according to the nature of the body from which it is distilled,—different products, more­over, being obtained according to the temperature at which the process of distillation is carried on. As commercial products there are two principal classes of tar in use—(1) wood tar, the product of the special distillation of several varieties of wood, and (2) coal tar, which is primarily a bye-product of the distillation of coal for the manufacture of illuminating gas. These tars are intimately related to the bitumen, asphalt, mineral pitch, and petroleum ob­tained in very many localities throughout the world.

*Wood Tar.—*Wood tar, known also as Stockholm and as Archangel tar, is principally prepared in the great pine forests of central and northern Russia, Finland, and Sweden. The material chiefly employed is the resinous stools and roots of the Scotch fir (*Pinus sylvestris*) and the Siberian larch *(Larix sibirica),* with other less common fir-tree roots. A large amount of tar is also prepared from the roots of the swamp pine *(P. australis)* in North and South Carolina, Georgia, and Alabama, in the United States. In the distillation of wood a series of products, including gas, tar, pyroligneous acid and wood spirit, and charcoal may be obtained, and any of these may be the primary object of the operation. When tar is the sub­stance sought, the ancient and crude method of working is yet largely adopted in the north of Europe. The wood to be treated is closely piled up into a huge conical stack or pile on an elevated platform, the sole of which is covered with clay and tiles. The sole slopes inwards from every side to the centre, where an opening communicates with a vaulted cavity under the elevated platform. The pile of wood is closely covered over with layers of turf and earth or sand to a depth of several inches, but leaving at first near the bottom numerous apertures for the admission of air to promote ignition. The pile is ignited from below, and as the fire spreads through the heap the various apertures are closed up and a slow smouldering combus­tion goes on for some days till, by the sinking of the pile, the top of the stack falls in, and a bright flame springs up at that point. About ten days after ignition tar first begins to flow, and it is at once collected into barrels. According to the size of the pile, the distillation may continue several weeks, the tar secured amounting to about 17∙5 per cent. of the wood operated on. In this method several valuable products—the gas, the crude pyro­ligneous acid, and much charcoal—are lost or wasted; and a more economical process of treating the wood in closed stills or retorts is now largely used in Russia, the gas evolved serving as fuel under the retorts. The heavier tar pro­ducts of the distillation collect at the bottom of the retort, whence they are carried off by a pipe to a receiver ; the ■ volatile portion passes off at the upper part of the retort, and is separately condensed, the lightest portion passing through a worm condenser. From treatment in close retorts resinous roots yield from 16 to 20 per cent. of tar, with some oil of turpentine and pyroligneous acid.

Wood tar is a semi-fluid substance, of a dark brown or black colour, with a strong pungent odour and a sharp taste. Owing to the presence of acetic (pyroligneous) acid, which is a collateral product, it has an acid reaction ; it is soluble in that acid, as well as in alcohol and the fixed and essential oils, &c. Tar consists essentially of a mixture of homologous hydrocarbons, and by redistillation it can be fractionated into a series of bodies having fixed boiling points. Some varieties of tar have a granular appear­ance, from the presence of minute crystals of pyrocatechin, which dissolve and disappear on heating the substance. Pyrocatechin dissolves freely in water, and to it the tar water (*liquor picis*) of pharmacy probably owes its value.

Crude tar from retorts, when submitted to redistillation, gives off wood spirit (methyl-alcohol), and then acetic (pyroligneous) acid, and finally, on forcing the heat, pitch oil is driven off. The residuum left in the still hardens into a solid vitreous mass, which forms the black pitch of commerce. Tar and pitch are most largely used as pro­tective coatings for woodwork and other materials much exposed to water and the weather. Thus tar is of great value in connexion with shipbuilding and shipping gene­rally. A considerable quantity is used in manufacturing tarred ropes, and in the “ smearing ” of highland sheep to afford a protection against the weather. Pitch also is the basis of the Berlin black or Brunswick black used for coat­ing cast-iron goods and for “japanning” preparations.

*Coal Tar.—*The art of distilling coal for the production of tar was discovered and patented by the earl of Dun- donald in 1787, and till the general introduction of coal gas some amount of coal was yearly distilled in Scotland for the production of coal tar. The demand for the sub­stance was limited, it being principally used for coating iron castings and smith work, for making an inferior lamp black, and as a source of a solvent oil. With the extensive use of coal gas the necessity for this separate distillation ceased, and soon tar was produced in the manu­facture of gas in quantities that could not be disposed of. It was burned up for heating gas-retorts ; it was mixed with coal dust, sawdust, &c., for making patent fuel ; and it was distilled for producing a series of hydrocarbon oils, heavy tar, and pitch ; but it was only after the dis­covery and introduction of “tar-colours” that the sub­stance came for some time to be really valuable. Since that time its price has fluctuated greatly ; and in the United Kingdom alone there are now distilled annually about 10,000,000 tons of coal for gas-making, producing 120,000,000 gallons of crude tar,—a quantity greatly in excess of the ordinary demand.

If wood be distilled slowly at low temperatures, the gases consist chiefly of carbonic oxide and carbonic acid, mixed with only very little of carburetted hydrogens, and consequently little luminous on combustion ; the watery part of the tar includes relatively much of methyl-alcohol, acetone, and acetic acid ; the oily part of the tar (tar proper) has a certain proximate composition characteristic of this mode of distillation. Our present knowledge in regard to this last-named point is very incomplete ; of definite species the following have been discovered :—

1. Phenol, C6H5 OH (synonym carbolic acid).
2. Cresol, (C6H4.CH3)OH.
3. Phlorol, (C6H4.OH)C2H5.
4. Pyrocatechine, (C6H4)(OH)2, one of three isomerides.
5. Guaiacol, C6H4{OHOCH3, methyl-ester of No. 4.
6. Homo-pyrocatechine, {C6H3(CH3)}(0H)2.
7. Creosol, {c6H3(CH3)}-øcH3, methyl-ester of No. 6.

Genuine creosote consists of (1), (2), (5), and (7). In addition, there are numberless bodies which still await scientific definition.

If the distillation of wood is carried out at a very high tempera­ture,—if, for instance, the wood is placed in a relatively large retort