

sition of the tar, as reflected by the relative proportions of the various fractionation products which can be extracted from such tars.

Then this next table, also cited from Jambon, illustrates the effects which different methods of production exert upon the chemical composition of tar as evidenced by the proportional relations of the different fractions obtainable from tar.

	Gas Tar	Dry Distillation	Water-Gas Tar
Ammonia	4.0	4.3	6.22
Light Oil	4.0	30.32	25.34
Heavy Oil	32.0	38.13	32.68
Paraffin	—	—	13.68
Asphalt	56.0	18.75	16.03
Gas	4.0	8.5	6.20

Numerous factors influence both the yield and the composition of the tar produced, in particular the kind of coal carbonized, the type of retort setting used, the temperature to which the coal is heated; and the manner in which the heat is applied (*Encyclopedia Britannica*). The following types of tar are distinguished for these reasons: (1) wood tar; (2) lignite tar; (3) gas works tar: (a) tar produced in horizontal retorts and (b) tar obtained in vertical retorts; (4) blast furnace tar; (5) coke-oven tar; (6) producer-gas tar; (7) water-gas tar; (8) synthetic and experimental tars resulting from the conversion of pure hydrocarbons, isoprene and acetylene (Kennaway) into tarry substances under the influence of high temperatures or being the products of the destructive carbonization of organic matter, such as skin, hairs, bones, cholesterol and tobacco (Kennaway; Roffo; and others). Tar of types 3 to 6 are manufactured from coal. Wood and vegetable tars have chiefly medicinal importance (ointments, hair lotions, soaps), while the coal tars are of pre-eminent industrial significance.

Wood and vegetable tar, produced by the carbonization of wood or vegetable matter under the exclusion of air, has an acid reaction, in contrast to the alkaline reaction of coal tar, because vegetables contain little ammonia (which is responsible for the basic character of coal tar), paraffins and naphthalenes. In vegetable tar there are, on the other hand, acids of the formic acid series as well as alcohols, aldehydes and aliphatic ketones. Tar prepared from resinous trees contains lower phenols as well as polyphenols, acetone, acetic acid, methyl alcohol, methyl acetate, and their homologues.

Lignite tar is obtained by heating lignite in generators built of brick. The older retorts used for this purpose were of the horizontal type, requiring a discontinuous type of operation and a higher temperature than the vertical retorts introduced about 1858, which enabled a continuous operation and the