approximately represented by mixtures of hydrocarbons with vegetable fibre. The following results have been selected from a great number of analyses by various chemists, and are for the most part taken from Bischof's *Chemical Geology*, (Vol. i. cap. XV.) The nitrogen, which in most cases was included with the oxygen in the analysis, has been disregarded, and the oxygen and hydrogen for the sake of comparison, have been calculated for twenty-four equivalents of carbon.

1. Vegetable fibre or cellulose,..... $C_{24}H_{20}O_{20}$
2. Wood, mean composition,..... $C_{24}H_{18\cdot4}O_{16\cdot4}$
3. Peat,.....(Vaux,)..... $C_{2}\ H_{14\cdot4}O_{10}$
4. .do. .....(Regnault,)..... $C_{24}H_{14\cdot4}O_{9\cdot6}$
5. Brown coal,.....(Schrötter,)..... $C_{24}H_{14\cdot3}O_{10\cdot6}$
6. do. do. .....(Woskresensky,). $C_{24}H_{13}O_{7\cdot6}$
7. Lignite,.....(Vaux,) ..... $C_{24}H_{11\cdot3}O_{6\cdot4}$
8. do. passing into mineral resin,. (Regnault,)..... $C_{24}H_{15}O_{3\cdot3}$
9. Bituminous coal,..... do. ..... $C_{24}H_{10}O_{3\cdot3}$
10. do. do. ..... do. ..... $C_{24}H_{10}O_{1\cdot7}$
11. do. do. ..... do. ..... $C_{24}H_{8\cdot4}O_{1\cdot2}$
12. do. do. ..... do. ..... $C_{24}H_{8}O_{0\cdot9}$
13. do. do. .....(Kühnert and Gräger,).. $C_{24}H_{7\cdot4}O_{1\cdot3}$
14. do. do. (mean comp.)....(Johnston)..... $C_{24}H_{9}O_{2}—O_{4}$
15. Albert coal,.....(Wetherell,) .... $C_{24}H_{15\cdot9}O_{1\cdot6}$
16. Asphalt, Auvergne,..... $C_{24}H_{17\cdot7}O_{2\cdot2}$
17. do. Naples,..... $C_{24}H_{14\cdot6}O_{2}$
18. do. Bastennes,..... $C_{\ 4}H_{1}\ O_{0\cdot7}$
19. Elastic bitumen, Derbyshire,.....(Johnston,)..... $C_{24}H_{22}O_{0\cdot3}$
20. Bitumen of Idria,..... $C_{24}H_{8}$
21. Petroleum and naphtha,..... $C_{24}H_{24}$

In the above table we see the transition from peat and brown coal to lignite, and thence to bituminous coal. Prof. Johnston from his experiments in various coals, including cannel from Wigan, splint coal from Workington and caking coal from Newcastle, deduced the composition given in 14, in which with $C_{24}H_{9}$ the oxygen varies from two to four equivalents. It will be seen from a comparison of the infusible Albert coal with the bitumens 16, 17 and 18, how gradual is the transition to the true petroleums and naphthas, from which oxygen is absent. The asphalts also, as will be observed, differ very much in their composition, and though generally much richer in hydrogen than the bituminous coals, the variety from Naples (17) which is completely fusible at 140° C., contains less hydrogen and more oxy-