form of some diabasic or basaltic rock, wherein the felspar crystals, though much decayed, can yet be traced, the augite, olivine, and magnetite being more or less completely changed into a mere pulverulent earthy substance.[11]

| | I. | II. |
|---|---|---|
| Silica | 38·830 | 36·8 |
| Alumina | 13·250 | 22·95 |
| Lime | 3·925 | 9·73 |
| Magnesia | 4·180 | 2·85 |
| Soda | 0·971 | 0·5 |
| Potash | 0·422 | 1·1 |
| Iron protoxide | 13·830 | 4·08 FeO |
| Iron peroxide | 4·335 | 2·6 $TiO_2$ |
| Carbonic acid | 9·320 | 11·9 |
| | | 0·75 $P_2O_5$ |
| Water | 11·010 | 7·7 |
| | 100·073 | 100·96 |

Traces of the glassy selvage of contact may still sometimes be detected in these altered rocks. The changes in the constitution of an igneous mass, owing to the surrounding rocks, is referred to at p. 948.

The basalt of Meissner (Lower Hesse) overlies a thick stratum of brown coal which shows an interesting series of alterations. Immediately under the igneous rock, a thin seam of impure earthy coal ("letten") appears as if completely burned. The next underlying stratum has been altered into metallic-lustred anthracite, passing downward into various black glossy coals, beneath which the brown coal is worthless. The depth to which the alteration extends is 5·3 metres.[12] Another example of alteration has been described by G. vom Rath from Fünfkirchen in Hungary.[13] A coal-seam has there been invaded by a basic

[11] The following analyses show the composition of these "white rock-traps." No. I., by Henry, is from the South Staffordshire coal-field ("The South Staffordshire Coal-Field," in Mem. Geol. Survey, p. 118); No. II., by E. Stecher, is from Newhalls, Queensferry, Linlithgowshire. (Tschermak's Mittheil. ix. 1887, p. 190. Proc. Roy. Soc. Edin. 1888, p. 172. These memoirs of Dr. Stecher give an account of the contact phenomena round the intrusive diabases of the Carboniferous series in the basin of the Firth of Forth.)

[12] Moesta, "Geologische Schilderung, Meissner und Hirschberge," Marburg, 1867.

[13] G. vom Rath, N. Jahrb. 1880, p. 276. In the above analysis the bitumen