vine-free dolerite—a similar rock but containing no olivine. Enstatite-dolerite contains enstatite in addition to the other ingredients. Nepheline-dolerite, has the felspar largely or entirely replaced by nepheline (see Nephelinite, p. 299).

As varieties of dolerite depending for their peculiarities mainly upon their antiquity and the consequent alteration they have undergone, we may include the rocks comprehended under the term Diabase.[196] This name was given to certain dark green or black eruptive rocks found in older geological formations, and consisting essentially of triclinic felspar, augite, magnetite or titaniferous iron, apatite, sometimes olivine, usually with more or less of diffused greenish chloritic substances (viridite) which have resulted from the alteration of the augite or olivine. The average composition of typical diabase may be taken to be: silica, 48–50; alumina, 16·0; protoxide of iron, 12–15; lime, 5–11; magnesia, 4–6; potash, 0·8–1·5; soda, 3–4·5; water, 1·5–2. Specific gravity about 2·9. There is generally carbonic acid present, united with some of the lime as a decomposition product. As in ordinary dolerite, gradations may be traced from coarsely crystalline diabase[197] into exceedingly fine-grained and compact varieties (Diabase-aphanite), which sometimes assume a fissile character (Diabase-schiefer) where they have been subjected to crushing or cleavage. Some kinds present a porphyritic structure, and show dispersed crystals of the component minerals (Diabase-porphyry, Labrador-porphyry, Augite-porphyry); or, as in some varieties of diorite, a concretionary arrangement is produced by the appearance of abundant pea-like bodies of a compact felsitic material, imbedded in a compact or finely crystalline ground-mass (Variolite). When the green compact ground-mass contains small kernels of carbonate of lime, sometimes in great numbers, it is called Calcareous aphanite or Calcaphanite. Sometimes the rock is abundantly amygdaloidal. Though, as a rule, free silica does not occur in it, some varieties found to contain this mineral, possibly a secondary product, have been distinguished as Quartz-diabase. The presence of olivine has suggested the name Olivine-

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[196] The student will find in the Zeitschrift. Deutsch. Geol. Ges. 1874, p. 1, an important memoir by Dathe on the composition and structure of diabase. See also Zirkel's "Microscop. Petrog." p. 97.

[197] Michel-Lévy. Bull. Soc. Géol. France, 3d ser. xi. p. 282. Geikie, Trans. Roy. Soc. Edin. xxix. p. 487.