(grey) and Swedish (grey, red and black) granites are also imported into the United Kingdom, much of it being dressed in the Aberdeen district. The distribution of granites in Great Britain is shown in Fig. 33 [1] and listed in Table III.

As indicating the composition of granite, that of the De Lank Silver Grey Granite (see Table III) consists of quartz 46 per cent., orthoclase felspar 30 per cent., plagioclase felspar 6 per cent., muscovite (white mica) 11 per cent. and biotite (black mica) 7 per cent.

(a) (ii) *Syenite.*—None of the true syenite quarried in this country is used for building purposes. It occurs in Leicestershire, Carnarvonshire, the Highlands of Scotland and the Channel Islands, where it is quarried and used for road material. A well-known syenite, called " Pearl Granite," is imported from Norway and used for plinths to shop fronts, etc.; it has a mottled appearance, with dark green markings and light-coloured patches. Syenite is hard, durable, strong and more easily worked than granite. Quartz is usually absent, felspar is the prevalent mineral, hornblende is present, and the mica content is usually less than in granite.

(a) (iii) *Diorite.*—This occurs in Leicestershire and Carnarvonshire. It is difficult to work, and this, in addition to its dull, dark green or black colour, renders it unsuitable for building purposes. It is sometimes known as *greenstone*, and is used as road metal. *Whinstone* is the name applied in Scotland to this stone, although in certain localities this name is given to any stone which is difficult to work or to stone used in road construction. Felspar, hornblende, augite and dark mica are present, and quartz is usually absent.

(a) (iv) *Gabbro* is quarried in Cornwall, certain parts of Wales, and in the Scottish Highlands. It is rarely used for building purposes on account of its bad weathering qualities and its dull appearance. Felspar, hornblende, augite or diallage are the chief minerals of gabbro.

(b) *Hypabyssal Rocks.*—These were masses of molten material which penetrated the overlying strata, and erosion of the latter has exposed these rocks at the surface. Cooling of the masses was more rapid than with the plutonic rocks, and their texture is therefore finer. Hypabyssal rocks, like plutonic rocks, are classed as acid, intermediate and basic. The rocks of the acid group are called *quartz porphyries*, those of the intermediate group are *porphyries* and *porphyrites*, and *dolerites* and *diabases* are of the basic group. The quartz porphyries and porphyrites occur in Cornwall and Devon (when they are known as *elvans*), North and South Wales and in Scotland; some of them readily take a polish and have been used for ornamental purposes and general walling; they are now used chiefly for breaking up into aggregates for concrete and road purposes. The porphyrites are quarried in Leicester, Somerset, Carnarvonshire, etc.; they are very tough and are commonly used for road metal. The dolerites and diabases have a wide distribution throughout Great Britain and are employed extensively for roads (the stone being sometimes crushed, screened, dried and coated with bitumen to form tarmacadam) and rough walling; this stone is known in the north as " whinstone."

(c) *Volcanic Rocks* have been formed from lava poured out at the surface from volcanoes. Rapid cooling and hardening caused the material to be fine grained and of a glassy character. Their group classification are *rhyolites* (acid), *trachytes* and *andesites* (intermediate) and *basalt* (basic). They are quarried in England, Scotland, Wales and Ireland, and are employed for road construction.

2. Sedimentary or Aqueous Rocks.—This division comprises those stones which are chiefly employed for building purposes. Most of these rocks are formed of fragments of igneous rocks which have been deposited by water in layers or strata. As successive layers were formed, these sediments became hardened and consolidated by great pressure and were cemented together by sandy or clayey paste or by a chemical substance (such as carbonate of lime) conveyed by the percolating water. Other rocks of this division are formed from the remains of marine organisms (shellfish, etc.) and chemically by precipitation. The principal sedimentary rocks are (*a*) sandstones and (*b*) limestones.

(a) *Sandstones.*—These consist of grains of quartz (sand or silica, see p. 85) held together by a cement or matrix. In addition to quartz, sandstones may contain such minerals as mica, felspar, hornblende and oxides of iron (see p. 85). The texture of the stone is influenced by the size and distribution of the grains; thus, a stone may vary from fine to coarse-grained, and be either compact or the grains may be more sparsely distributed in the cementing material. As the quartz grains are practically indestructible, the durability of sandstones and grits (see p. 89) depends chiefly upon the cementing material. With the exception of freestones (see p. 89), sandstones are highly stratified, the *bedding* or natural bed being clearly visible as a general rule. The beds vary in thickness from a few inches to many feet.

The principal cements, the composition of which varies considerably, are *siliceous*, *calcareous*, *ferruginous* and *argillaceous*; two or more of these substances may be present in the cement. Sandstones are classified according to the nature of the binding material, thus (i) *siliceous sandstones*, (ii) *calcareous sandstones*, (iii) *ferruginous sandstones* and (iv) *argillaceous sandstones*. They may also be classified as (v) *micaceous sandstones* and (vi) *felspathic sandstones*, if either mica or felspar respectively is present in fair quantity. In addition, sandstones are classified according to the character of the grains and degree of the stratification, *e.g.*, (vii) *gritstones*, (viii) *flagstones*, (ix) *tilestones*, (x) *liver stones*, (xi) *freestones* and (xii) *York stone*.

(a) (i) *Siliceous Sandstones.*—The grains of these stones are held together by siliceous cement (silica deposited from solution in water). Such sandstones are exceedingly durable, as the silica has good cementing properties and is not attacked by acids in the atmosphere. They are very hard and are usually difficult to work. Examples of siliceous sandstones are the gritstones (see p. 89 and Table V).

(a) (ii) *Calcareous Sandstones.*—The grains are bound together by calcareous cement, which is composed of *calcite* (crystals of carbonate of lime) or a combination of carbonate of lime and carbonate of magnesia and known as *dolomite* (when they are called *dolomitic sandstones*). Whilst both calcite and dolomite have good binding qualities, they are not durable if exposed to polluted atmospheres owing to the acids attacking the matrix and loosening the grains of sand which gradually become removed by the weather. These stones are easily worked. White Mansfield is an example of a dolomitic sandstone (see p. 92).

(a) (iii) *Ferruginous Sandstones.*—The cementing material is largely ferruginous, *i.e.*, oxides of iron deposited from solution. This influences the colour (such as brown, red, brownish-yellow, etc.) of the stone. These are good weathering stones, although they may be affected by frost action in very exposed situations. Red Runcorn and Woolton are of this class (see Table V).

[1] Only some of the important quarries producing granite for building purposes are indicated here. A number of well-known quarries have been closed down because of the absence of demand, and a large number of igneous rock quarries produce stone which is used solely as road metal and for concrete aggregates.