## Tables Revised

### (Table 1) Plateau Magma-Type of Figure 2

| | A | B | I. | II. | III. | C1 | D | E | |
|---|---|---|---|---|---|---|---|---|---|
| $SiO_2$ | 43.94 | 45.24 | 45.37 | 45.48 | 45.52 | 46.46 | 46.61 | 47.64 | $SiO_2$ |
| $TiO_2$ | 2.45 | 2.26 | 2.87 | 3.48 | 2.85 | 2.07 | 1.81 | 1.27 | $TiO_2$ |
| $Al_2O_3$ | 14.03 | 15.63 | 15.16 | 15.66 | 14.30 | 15.48 | 15.32 | 14.15 | $Al_2O_3$ |
| $Cr_2O_3$ | tr. | tr. | — | — | — | 0.02 | tr. | 0.01 | $Cr_2O_3$ |
| $V_2O_3$ | — | — | — | — | — | 0.05 | — | 0.06 | $V_2O_3$ |
| $Fe_2O_3$ | 1.95 | 5.56 | 3.38 | 3.64 | 3.43 | 3.63 | 3.49 | 5.18 | $Fe_2O_3$ |
| FeO | 11.65 | 7.19 | 11.58 | 10 56 | 9.00 | 10.23 | 7.71 | 7.96 | FeO |
| MnO | 0.32 | 0.23 | 0.31 | 0.20 | 0.19 | 0.48 | 0.13 | 0 33 | MnO |
| (Co,Ni)O | nt. fd. | tr. | nt. fd. | — | — | 0.02 | tr. | tr. | (Co,Ni)O |
| MgO | 10.46 | 7.82 | 6.72 | 6.99 | 10.65 | 6.80 | 8.66 | 7.38 | MgO |
| CaO | 8.99 | 9.38 | 8.11 | 8.24 | 9.54 | 9.05 | 10.08 | 11.71 | CaO |
| (Ba,Sr)O | nt. fd. | — | nt. fd. | — | — | 0.02 | — | nt. fd. | (Ba,Sr)O |
| $Na_2O$ | 2.68 | 2.1 | 2.90 | 2.68 | 2.1 | 3.01 | 2.3 | 2.38 | $Na_2O$ |
| $K_2O$ | 0.33 | 0.72 | 0.44 | 0.49 | 0.42 | 0.68 | 0.67 | 0.71 | $K_2O$ |
| $Li_2O$ | nt. fd. | — | nt. fd. | nt. fd. | nt. fd. | ? tr. | — | — | $Li_2O$ |
| $H_2O$ +105° | 2.31 | 2.21 | 1.96 | 1.52 | 1.53 | 1.43 | 2.07 | 1.44 | $H_2O$ +105° |
| $H_2O$ at 105° | 0.85 | 1.12 | 1.18 | 0.93 | 0.70 | 0.89 | 1.10 | 0.19 | $H_2O$ at 105° |
| $P_2O_5$ | 0.20 | 0.20 | 0.29 | 0.26 | 0.23 | 0.30 | tr. | 0.09 | $P_2O_5$ |
| $CO_2$ | 0.16 | 0.49 | — | 0.21 | 0.15 | nt. fd. | tr. | — | $CO_2$ |
| $FeS_2$ | 0.04 | — | — | — | — | — | — | — | $FeS_2$ |
| $Fe_7S_8$ | 0.06 | — | — | — | — | — | — | — | $Fe_7S_8$ |
| ½S | — | — | — | — | — | 0.08 | — | — | ½S |
| S | — | — | — | nt. fd. | nt. fd. | — | — | 0.03 | S |
| | 100.42 | 100 06 | 100.27 | 100.34 | 100.72 | 100.70 | 100.08 | 100.53 | — |
| Spec. grav. | — | 2.85 | 2.95 | 2.93 | 2.99 | — | 2.87 | — | — |

Table I.: Plateau Magma-Type of (Figure 2)

A. (S14174) [NR 440 731], Lab. No. 339). Dyke. Slac nan Sgarbh; Jura. **Crinanite**, quoted from J. S. Flett, Geology of Knapdale, Jura & North Kintyre, 1911, p. 118. Anal. E.G. Radley.

B. (S7854) [NG 502 336], Lab. No. 22). Sill. Ben Lee; Skye. **Dolerite**, quoted from A Harker, Tertiary Igneous Rocks of Skye, 1904, p. 248. Anal. W. Pollard.

I. (S15995) [NM 5412 2210], Lab. No. 390). Lava. Stream at pit, ■ m. N.N.E. of Pennycross House, 750 ft. above sea; Mull. **Basalt**, p. 137. Anal. E. G. Radley.

II. (S19070) [NM 6786 4463], Lab. No. 460). Lava. Raised-beach cliff, 200 yds. W. of Lochaline Pier, between first two walls crossing raised beach west of Pier; Morven. **Basalt**, p. 136. Anal. F.R. Ennos.

III. (S19071) [NM 6633 4446], Lab. No. 461). Lava. Thick flow on ashy material, little port, east side of Rudha Dearg, 1 m. west of Lochaline; Morven. **Basalt**, p. 137. Anal. F. R. Ennos.

C. (S11727) [NM 337 993], Lab. No. 184). Lava. Orval; Rum. **Basalt**, quoted from A. Harker, Geology of the Small Isles of Inverness-shire, 1908, p. 57. Anal. W. Pollard.

D. (S8185) [NG 42 28], Lab. No. 21). Lava. Drynoch; Skye. **Basalt**, quoted from W. Pollard, Summary of Progress of Geol. Surv. for 1899, p. 174; see also A. Harker, Tertiary Igneous Rocks of Skye, p. 31. Anal. W. Pollard.

E. (S8062) [NG 468 256], Lab. No. 79). Cone-Sheet. Cuillins; Skye. **Dolerite**, emended analysis quoted from A. Harker, Tertiary Igneous Rocks of Skye, p. 370. Anal. W. Pollard.

## (Table 2) Non-Porphyritic Central Magma-Type of Figure 2

| | Tholeiite Salen Type | Basalt Staffa Type | Basalt Staffa Type | Basalt Staffa Type | Basalt Compact Central Type | Basalt Compact Central Type | Tholeiite Brunton Type | | Quartz-Dolerite and Tholeiite Talaidh Type | Quartz-Dolerite and Tholeiite Talaidh Type |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | A | IV | V | VI | VII | VIII | IX |
| $SiO_2$ | 47.35 | 47. 80 | 49.76 | 52.13 | 50. 54 | 53.78 | 51..53 | 51.63 | 5276 | 53.97 |
| $TiO_2$ | 1.75 | — | 0.94 | — | 2.80 | 2.28 | 1.57 | 2.00 | 3.25 | 1.24 |
| $Al_2O_3$ | 13.90 | 14.80 | 14.42 | 14.87 | 12.86 | 12.69 | 11.05 | 11.77 | 11.95 | 14.65 |
| $Fe_2O_3$ | 5.87 | — | 3.95 | — | 4.13 | 3.44 | 2.73 | 3.23 | 4.86 | 3.62 |
| FeO | 8.96 | 13.08 | 7.77 | 11.40 | 8.75 | 8.94 | 10.08 | 10.47 | 9.92 | 6.32 |
| MnO | 0.23 | 0.09 | 0.20 | 0.32 | 0.32 | 0.53 | 0.45 | 0.35 | 0.18 | 0.30 |
| (Co, Ni)O | nt. fd. | — | nt. fd. | 1 | 0.06 | nt. fd. | nt. fd. | 0.04 | — | nt. fd. |
| MgO | 5.97 | 6.84 | 5.30 | 1 6.46 | 4.63 | 2.58 | 5.21 | 5.02 | 3.77 | 4.49 |
| CaO | 10.65 | 12.89 | 10.22 | 10.56 | 8.74 | 6.36 | 9.68 | 9.34 | 7.14 | 7.98 |
| BaO | — | — | 0.04 | — | nt. fd. | 0.09 | nt. fd. | 0.03 | — | 0.04 |
| $Na_2O$ | 2.73 | 2.48 | 2.49 | 2.60 | 2.89 | 2.74 | 3.48 | 2.90 | 2.36 | 2.54 |
| $K_2O$ | 0.54 | 0.86 | 1.83 | 0.69 | 1.43 | 2.27 | 0.86 | 0.91 | 1.74 | P52 |
| $LiO_2$ | — | — | tr. | — | nt. fd. | nt. fd. | tr. | nt. fd. | — | tr. |
| $H_2O$+105° | 1.16 | | 1.03 | | 2.25 | 2.19 | 1.26 | 1.40 | 1.95 | 0.94 |
| $H_2O$ at 105° | 1.04 | 1.41 | 2.04 | 1.9 | 0.17 | 1.19 | 0.71 | 0.68 | 0.56 | 1.92 |
| $P_2O_5$ | 0 24 | — | 0.21 | — | 0.34 | 0.55 | 0.22 | 0.29 | 0.24 | 0.27 |
| $CO_2$ | 0.32 | — | 0.06 | — | 0.33 | 0.08 | 0.08 | 0.11 | 0.18 | 0.51 |
| $FeS_2$ | | — | 0.04 | — | nt. fd. | 0.42 | 0.26 | 0.08 | — | 0.09 |
| S | 0.23 | — | — | — | — | — | — | — | 0 18 | |
| | 100.94 | 100.25 | 100.30 | 100.22 | 100.24 | 100.13 | 100.07 | 100.27 | 100.44 | 100.40 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Spec. grav. | 2.96 | — | 2.72 | — | 2.90 | 2.68 | 2.93 | 2.95 | 2.91 | 2.831 |

I. (S16808) [NM 5593 4670], Lab. No. 407). Dyke. Shore ¼ mile S.S.E. of Kintallen and 2 miles N.N.W. of Salen; Mull. **Tholeiite**, Salen Type, p. 371. Anal. F. R. Ennos.

II. Lava. Staffs,. **Basalt**, staffa type. Anal. A. Streng, quoted from Pogg. Ann. vol. xc., 1853, p. 114.

III. (S20581) [NM 4025 2793], Lab. No. 669). Lava, which encloses Macculloch's Tree. Rudha na h-Uamha; Mull. **Basalt**, Staffa Type, p. 145, Anal. E. G. Radley,

A. Lava. Giant's Causeway; Ireland. **Basalt**, Staffa Type. Anal. A. Streng, quoted from Pogg. Ann., vol. xc., 1853, p. 114.

IV. (S18474) [NM 6309 3205], Lab. No. 448). Lava. Monadh Beag, stream-junction 1000 yards N. of Ishriff; Mull. **Basalt**, Compact Central Type, p. 149. Anal. E. G. Radley.

V. (S14824) [NM 5819 3928], Lab. No. 369). Lava. 1 mile N.E.of Loch Bà, 2 miles E. of Gruline House; Mull. **Basalt**, Compact Central Type, p. 149. Anal. E. G. Radley.

VI. (S16810) [NM 5541 4837], Lab. No. 406). Dyke. Shore, ¼ mile E. of Arla, and 5½ miles S.E. of Tobermory; Mull. **Tholeiite**, Brunton Type, p. 372. Anal. E. G. Radley.

VII. (S16809) [NM 5592 4755], Lab. No. 411). Dyke. Shore mile ¼ N. of Kintallen, and 3 miles N.N.W. of Salen ; Mull, **Tholeiite**, Brunton Type, p. 372. Anal. E. G. Radley.

VIII. (S18967) [NM 6869 3105], Lab. No. 444). Cone-Sheet. 70 yards S. of summit, Cruachan Dearg ; Mull. **Quartz-Dolerite**, Talaidh Type, p. 301. Anal. F. R. Ennos,

IX. (S17170) [NM 5238 2024], Lab. No. 432). Basic Margin, Composite Sill. Rudh 'a 'Chromain ; Mull. **Tholeiite**, Talaidh Type, pp. 285, 286. Anal. E. G. Radley.

## (Table 3) Intermediate to Subacid Magma-Type of (Figure 2)

| | Craignurite (basic) | Leidleite | Leidleite | Inninmorite | Inninmorite | Inninmorite (acid) | Craignurite |
|---|---|---|---|---|---|---|---|
| | I. | II. | III. | IV. | V. | VI. | |
| $SiO_2$ | 55.82 | 59.21 | 61.69 | 62.37 | 64.13 | 66.27 | $SiO_2$ |
| $TiO_2$ | 1.62 | 1.06 | 1.00 | 1.06 | 1.19 | 0.87 | $TiO_2$ |
| $Al_2O_3$ | 11.47 | 14.06 | 14.43 | 12.04 | 13.15 | 11.92 | $Al_2O_3$ |
| $Fe_2O_3$ | 3.68 | 2.66 | 1.23 | 1.87 | 1.08 | 3.09 | $Fe_2O_3$ |
| FeO | 7.66 | 4.87 | 5.86 | 5.81 | 6.31 | 3.18 | FeO |
| MnO | 0.40 | 0.24 | 0.30 | 0.24 | 027 | 0.31 | MnO |
| (Co,Ni)O | 0.04 | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO | 4.08 | 3.71 | 2.81 | 0.97 | 1.08 | 1.44 | MgO |
| CaO | 7.88 | 5.95 | 4.97 | 3 51 | 3 62 | 3.30 | CaO |
| BaO | 0.03 | 0.03 | 0.04 | 0.07 | 0.09 | nt. fd. | BaO |
| $Na_2O$ | 2.58 | 2.06 | 3.20 | 3.47 | 3.64 | 2.89 | $Na_2O$ |
| $K_2O$ | 2.00 | 2.83 | 1.72 | 2.34 | 2.32 | 4.03 | $K_2O$ |
| Li2O | tr. | nt. fd. | nt. fd. | nt ftl. | nt. fd. | tr. | Li2O |
| H2O + 105° | 1.88 | 1.49 | 2.32 | 5.54 | 2.71 | 1.51 | H2O-1–105° |
| H2O at 105° | 0.66 | 2.06 | 0.25 | 0.44 | 0.36 | 0.78 | H2O at 105° |
| P2O6 | 0.23 | 0.20 | 0.24 | 0.30 | 0.31 | 0.17 | P2O6 |
| $CO_2$ | 0.08 | — | — | — | — | 0.53 | $CO_2$ |
| $FeS_2$ | 0.09 | nt. fd. | nt. fd. | nt fd. | nt. fd. | nt. fd. | $FeS_2$ |
| Cl. | | nt. fd. | 002 | — | — | — | Cl. |
| | 100.18 | 100.43 | 100.08 | 100.03 | 100.26 | 100.29 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spec. grav. | 2.88 | 2.61 | 2.64 | 2.50 | 2.57 | 2.65 | Spec. grav. |

I. (S16800) [NM 6857 3750], Lab. No. 412). Cone-Sheet. Allt an Dubh-choire, 1220 yards above junction with Scallastle River; Mull. **Craignurite** (basic), p. 226. Anal. E. G. Radley.

II. (S15997, Lab. No. 385). Sill, stony margin of III. ¼ mile N.N.E. of Mullach Glac an t-Sneachda (Loc. 1, (Figure 43), p. 261); Mull. Stony **Leidleite**, p. 281. Quoted from E. M. Anderson and E. G. Radley, Quart Journ, Geol Soc., vol. lxxi, p. 212. Anal. E. G. Radley.

III. (S15996) [NM 5021 2337], Lab. No. 384). Sill, glassy centre of II. Glassy **Leidleite**, or **Leidleite-pitchstone**, p. 281. Quoted from E. M. Anderson and F. G. Radley, ibid, p. 212. Anal. E. G. Radley.

IV. (S15989) [NM 5077 2552], Lab. No. 386). Sheet. Near head of stream from Tòm a' Choilich, ½ mile S.W. of Pennyghael (Loc. 4, (Figure 43), p. 261); Mull. Exceptionally glassy **Inninmorite**, or **Inninmorite-Pitchstone**, p. 283. Quoted from E. M. Anderson and E. G. Radley, ibid, p. 212. Anal. E. G. Radley.

V. (S15990) [NM 5176 2404], Lab. No. 387). Sheet. 3/16 mile S.W. of Trig. Station on Beinn an Lochain (Loc. 5, (Figure 43), p. 261); Mull. Fairly glassy **Inninmorite** or **Inninmorite-Pitchstone**, p. 284. Quoted from E. M. Anderson and E G. Radley, ibid, p. 212. Anal. E. G. Radley.

VI. (S16802) [NM 6903 3752], Lab. No. 413). Cone-Sheet. Allt an Dubh-choire, 630 yards above junction with Scallastle River; Mull. **Craignurite** (acid), p. 225. Anal. E. G. Radley.

## (Table 4) Acid Magma-type of Figure 2

| | I | II | III | IV | V | |
|---|---|---|---|---|---|---|
| $SiO_2$ | 70.70 | 71.30 | 72.66 | 73.12 | 73.32 | $SiO_2$ |
| $TiO_2$ | 1.27 | 0.58 | 0.34 | 0.39 | 0.51 | $TiO_2$ |
| $Al_2O_3$ | 11.78 | 11.24 | 12.00 | 12.44 | 12.25 | $Al_2O_3$ |
| $Fe_2O_3$ | 1.32 | 1.80 | 2.03 | 2.09 | 2.77 | Fe2O3 |
| FeO | 3.45 | 2.84 | 2.04 | 1.65 | 2.20 | FeO |
| MnO | 0.07 | 0.31 | 0.18 | 0.17 | 0.12 | MnO |
| (Co,Ni)O | — | nt. fd. | nt. id. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO | 0.53 | 0.61 | 0.07 | 0.14 | 0.11 | MgO |
| CaO | 1.30 | 1.56 | 1.25 | 0.88 | 1.65 | CaO |
| BaO | — | 0.07 | 0.12 | nt. fd. | 0.09 | BaO |
| $Na_2O$ | 2.48 | 3.44 | 3.26 | 3.90 | 3.92 | $Na_2O$ |
| $K_2O$ | 4.71 | 4.66 | 5.26 | 4.67 | 2.34 | $K_2O$ |
| $Li_2O$ | — | ? tr. | nt. fd. | nt. fd. | nt. fd. | $Li_2O$ |
| H2O+105° | 1.14 | 1.04 | 0.47 | 0.24 | 0.35 | H2O+105° |
| H2O at 105° | 0.50 | 0.39 | 0.22 | 0.25 | 0.35 | H2O at 105° |
| $P_2O_5$ | 0.26 | 0.22 | 0.04 | 0.09 | 0.10 | $P_2O_5$ |
| CO2 | 0.51 | — | 0.24 | 0.05 | 0.06 | CO2 |
| $FeS_2$ | | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $FeS_2$ |
| S | 0.08 | — | — | — | — | S |
| | 100.10 | 100.06 | 100.18 | 100.08 | 100.14 | |
| Spec. grav. | 2.58 | 2.53 | 2.61i | 2.57 | 2.66 | Spec. grav. |

I. (S18464) [NM 5361 2259], Lab. No. 443). Sill. S. of Coire Buidhe, between 800 and 900 foot contours, about ½ mile N. of Carsaig; Mull. **Felsite** allied to inninmorite, p. 286. Anal. F. R. Ennos.

II. (S16803) [NM 7167 3731], Lab. No. 394). Cone-Sheet. Craignure Bay, shore 50 yards N.N.W. of U.F.C. Manse; Mull. Fine **Granophyre** allied to craignurite, p. 226. Anal. E. G. Radley.

III. (S14825) [NM 5551 3738], Lab. No. 370). Loch Bà Ring-Dyke. Top of deep gorge ¾ mile N. of E. of Summit of Beinn a' Ghràig; Mull. **Rhyolite**, p. 347. Anal. E. G. Radley.

IV. (S14843) [NM 5497 3843], Lab. 372). Beinn a' Ghràig Ring-Dyke. Benmore Lodge, Loch Bà; Mull. **Granophyre**, p. 347. Anal. E. G. Radley.

V. (S14841) [NM 5427 3847], Lab. No. 371). Knock Ring-Dyke. Beinn Bheag, ¼ mile S. of Knock; Mull. **Granophyre**, p. 349. Anal. E. G. Radley.

## (Table 5) Allivalite-Eucrite Magma Series of Figure 3

| | | Eucrite I. | B | |
|---|---|---|---|---|
| | Allivalite A | Eucrite I. | Eucrite B | |
| $SiO_2$ | 42.20 | 46.66 | 48.05 | $SiO_2$ |
| TiO | 0.09 | 0.47 | 0.49 | TiO |
| $Al_2O2$ | 17.56 | 16.71 | 15.35 | $Al_2O2$ |
| Cr2O2 | 0.06 | — | 0.14 | Cr2O2 |
| Fe2O2 | 1.20 | 2.69 | 1.86 | Fe2O2 |
| FeO | 6.33 | 5.87 | 7.53 | FeO |
| MnO | 0.18 | 0.12 | 0.28 | MnO |
| (Co, Ni)O | 0.13 | — | 0.11 | (Co, Ni)O |
| CuO | 0.04 | — | 0.05 | CuO |
| MgO | 20.38 | 12.36 | 12.53 | MgO |
| CaO | 9.61 | 12.57 | 11.02 | CaO |
| $Na_2O$ | 1.11 | 1.16 | 1.26 | $Na_2O$ |
| $K_2O$ | 0.11 | 0.27 | 0.19 | $K_2O$ |
| $Li_2O$ | — | nt. fd. | — | $Li_2O$ |
| $H_2O$ + 105° | 1.13 | 1.24 | 0.45 | $H_2O$ + 105° |
| $H_2O$ at 105° | 0.06 | 0.13 | 0.15 | $H_2O$ at 105° |
| $P_2O_5$ | — | 0.13 | — | $P_2O_5$ |
| $CO_2$ | tr. | 0.18 | 0.44 | $CO_2$ |
| S | 0.02 | nt. fd. | 0.20 | S |
| | 100.21 | 100.56 | 100.10 | |
| Spec. grav. | 2.96 | 2.97 | 2.95 | Spec. gray. |

A. (S10464) [NM 395 962], Lab. No. 120). Major Intrusion. Allival; Rum. **Allivalite**, quoted from A. Harker, Geology of the Small Isles of Inverness-shire, 1908, p. 80. Anal. W. Pollard.

I. (S19069) [NM 606 268], Lab. No. 459). Major Intrusion. About 500 yards S.E. of summit of Ben Buie; Mull. **Eucrite**, p. 250. Anal. F. It. Ennos.

B. (S10471) [NM 400 960], Lab No. 123). Major Intrusion. Allt Màr na h-Uamha; Rum. **Eucrite**, quoted from A. Harker, Geology of the Small Isles of Inverness-shire, 1908, p. 98. Anal. W. Pollard.

## (Table 6) Porphyritic Central Magma-Type of Figure 3

| | I. | A | B | II. | III. | IV. | V. | |
|---|---|---|---|---|---|---|---|---|
| $SiO_2$ | 45.54 | 46.39 | 47.28 | 48.34 | 47.24 | 47.49 | 48.51 | $SiO_2$ |
| $TiO_2$ | 1.06 | 0.26 | 0.28 | 0.95 | 1.46 | 0.93 | 1.46 | $TiO_2$ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $Al_2O_3$ | 23.39 | 26.34 | 21.11 | 20.10 | 18.55 | 21.46 | 19.44 | $Al_2O_3$ |
| $Cr_2O$ | — | tr. | — | — | — | — | — | $Cr_2O$ |
| $Fe_2O_3$ | 1.98 | 2.02 | 3.52 | 11.97 | 6.02 | 1.72 | 5.66 | $Fe_2O_3$ |
| FeO | 6.98 | 3.15 | 3.91 | 6.62 | 4.06 | 4.80 | 4.00 | FeO |
| MnO | 0.27 | 0.14 | 0.15 | 0.32 | 0.31 | 0.15 | 0.23 | MnO |
| (Co,Ni)O | | | | nt. fd | 0.05 | 0.04 | 0.04 | (Co,Ni)O |
| MgO | 4.60 | 4.82 | 8.06 | 5.49 | 5.24 | 4.59 | 5.12 | MgO |
| CaO | 11.82 | 15.29 | 13.42 | 13.16 | 11.2 | 13.24 | 12.03 | CaO |
| BaO | | | | 0.10 | nt. fd | nt. fd. | nt. fd. | BaO |
| $Na_2O$ | 2.50 | 1.63 | 1.52 | 1.66 | 2.42 | 2.17 | 2.53 | $Na_2O$ |
| $K_2O$ | 0.44 | 0.20 | 0.29 | 0.98 | 0.15 | 0.42 | 0.25 | $K_2O$ |
| $Li_2O$ | — | — | — | nt. fd. | nt. fd | nt. fd. | nt. fd. | $Li_2O$ |
| $H_2O$ -F 105° | 0.72 | 0.48 | 0.53 | 0.44 | 2.24 | 2.54 | 0.48 | $H_2O$ -F 105° |
| $H_2O$ at 105° | 0.62 | 0.10 | 0.13 | 0.02 | 0.21 | 0.17 | 0.04 | $H_2O$ at 105° |
| $P_2O$ | 0.13 | tr. | tr. | 0.04 | 0.26 | 0.43 | 0.16 | $P_2O$ |
| $CO_2$ | — | — | — | 0.11 | 0.19 | 0.08 | 0.09 | $CO_2$ |
| $FeS_2$ | — | — | — | nt. fd. | nt. fd. | nt fd. | nt. fd. | $FeS_2$ |
| | 100.05 | 100.82 | 100.20 | 100.30 | 100.12 | 100.23 | 100.04 | $SiO_2$ |
| Spec. grav. | 2.85 | 2.85 | 2.90 | 2.93 | 2.85 | 2.82 | 2.93 | $TiO_2$ |

I. (S15994) [NM 5356 2253], Lab. No. 389). Sill. Hillside between two streams S. of Coire Buidhe; Mull. **Small-felspar dolerite**, p. 285. Anal. E. G. Radley.

A. (S8043) [NG 481 232], Lab. No. 18). Major Intrusion, Cuillins. Sligachan River; Skye. **Olivine-gabbro**, quoted from Harker, Tertiary igneous rocks of Skye; 1904, p. 103. Anal. W. Pollard.

B. (S8194) [NG 449 242], Lab. No. 19). Major Intrusion, Cuillins. Coir 'a 'Mhadaidh; Skye. **Olivine-gabbro**, quoted from Harker, ibid. p. 103. Anal. W. Pollard.

II. (S14846) [NM 5959 3684], Lab. No. 373). Major Intrusion, Beinn na Duatharach. 5/8 mile N.N.W. of summit of B. na Duatharach; Mull. **Olivine-gabbro**. Anal. E. G. Radley.

III. (S18469) [NM 5640 2847], Lab. No. 445). Lava. ½ mile S.S.W. of Derrynaculen; Mull. **Basalt**, Porphyritic Central Type, p. 148. Anal. E. G. Radley.

IV. (S18472) [NM 5960 3011], Lab. No. 447). Pillow-lava. ¼ mile slightly E. of S. of cairn on Cruach Choireadail; Mull. **Basalt**, Porphyritic Central Type, p. 150. Anal. E. O. Radley.

V. (S18471) [NM 5757 2907], Lab No. 446). Lava. 3/8 a mile N.E. of cairn on Cruach Doire nan Guilean, west side of a little lochan; Mull. **Basalt**, Porphyritic Central Type, p. 148, Anal.. E. G. Radley.

## (Table 7) Alkaline Magma-Series of Figure 4

| | | Mugearite | Mugearite | Mugearite | Syenite | Trachyte | Trachyte | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | I | II | III | IV | |
| $SiO_2$ | 49.24 | 49.92 | 50.70 | 55.76 | 58.81 | 60.13 | 63.12 | $SiO_2$ |
| $TiO_2$ | 1.84 | 2.04 | 1.89 | 1.78 | 0.76 | 0.73 | 0.51 | $TiO_2$ |
| $AL_2O_3$ | 15.84 | 12.83 | 14.60 | 16.55 | 14.81 | 16.53 | 15.44 | $AL_2O_3$ |
| $Cr_2O_3$ | tr. | tr. | — | — | — | — | — | $Cr_2O_3$ |
| $V_2O_3$ | | 0.04 | — | — | — | — | — | $V_2O_3$ |
| $Fe_2O_5$ | 4.09 | 6.96 | 5.23 | 3.10 | 4.58 | 2.86 | 1.73 | $Fe_2O_5$ |
| FeO | 7.18 | 6.21 | 7.68 | 6.02 | 4.21 | 2.55 | 3.53 | FeO |
| MnO | 0.29 | 0.52 | 0.42 | 0.22 | 0.27 | 0.46 | 0.27 | MnO |
| (Co,Ni)O | tr. | 0.03 | tr. | nt. fd. | nt. fd. | nt. fd. | nt fd. | (Co,Ni)O |
| MgO | 3.02 | 3.78 | 4.15 | 1.08 | 0.80 | 1.20 | 0.62 | MgO |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CaO | 5.26 | 7.25 | 7.20 | 3.23 | 2.33 | 1.61 | 1.31 | CaO |
| BaO | 0.09 | 0.09 | 0.08 | 0.07 | 0.03 | 0.11 | nt. fd. | BaO |
| SrO | tr. | tr. | tr. | — | — | — | — | SrO |
| $Na_2O$ | 5.21 | 3.72 | 3.71 | 4.28 | 5.60 | 8.06 | 5.81 | $Na_2O$ |
| $K_2O$ | 2.10 | 1.73 | 1.33 | 3.87 | 4.96 | 3.99 | 5.36 | $K_2O$ |
| $Li_2O$ | | tr. | ? tr. | tr. | nt. fd. | tr. | nt. fd. | $Li_2O$ |
| $H_2O$+105.° | 1.61 | 1.05 | 1.15 | 0.95 | 0.82 | 0.97 | 0.44 | $H_2O$+105.° |
| $H_2O$ at 105° | 1.08 | 3.58 | 2.08 | 0.80 | 2.00 | 0.55 | 0.14 | $H_2O$ at 105° |
| $P_2O_5$ | 1.47 | 0.45 | 0.49 | 0.40 | 0.20 | 0.57 | 0.25 | $P_2O_5$ |
| $CO_2$ | — | nt. fd. | nt. fd. | 0.03 | — | — | 1.89 | $CO_2$ |
| $FeS_2$ | — | — | — | nt. fd. | nt. fd. | nt. | nt. fd. | $FeS_2$ |
| S | 0.03 | 1 tr. | nt. fd. | — | — | — | — | S |
| F | 0.18 | — | — | — | — | — | — | F |
| | 100.46* | 100.20 | 100.71 | 100.14 | 100.18 | 100.32 | 100.42 | |
| Spec. grav. | 2.79 | — | — | 2.67 | 2.64 | 2.51 | 2.89 | Spec. grav. |

A. (S8732) [NG 437 366], Lab, No. 80). Sill. Druim na Criche; Skye. **Mugearite**, quoted from A. Harker, Tertiary Igneous Rocks of Skye, 1904, p. 263. Anal. W. Pollard. *The total is 100.53 – 0.07 (oxygen equivalent of 0.18 fluorine).

B. (S11731) [NG 270 050], Lab. No. 179). Sill. Eilean a Bhaird; Canna. **Doleritic Mugearite**, quoted from A. Harker, Geology of the Small Isles of Inverness-shire, 1908, p. 130. Anal. W. Pollard.

C. (S11732) [NM 340 999], Lab. No. 186). Sill. Pass S. of Fionn-Chrò; Rum. **Doleritic Mugearite**, quoted from A. Harker, Geology of the Small Isles of Inverness-shire, p. 130. Anal. E. G. Radley.

I. (S20582) [NM 5364 2832], Lab. No. 670). Lava of Ben More horizon. Below road, 290 yards E. of Kinloch Hotel; Mull.: **Mugearite**, p. 144. Anal. E. G. Radley.

II. (S15991) [NM 5463 2063], Lab. No, 388). Intrusion. Gamhnach Mhòr, Carsaig Bay; **Syenite**, p. 189. Anal. E. G. Radley.

III. (S15753) [NM 5475 5022], Lab. No. 393). Plug in Ardnacross Vent. Shore mile W. of Rudh' an t-Sean-Chaisteil; between Salen and Tobermory; Mull. **Trachyte**, p. 192. Anal. E. O. Radley.

IV. (S14821) [NM 5429 3866] [NM 5429 3866]a, Lab. No. 368). Plug in Vent. Bràigh a' Choir' Mhòr., W. of Salen; Mull, **Trachyte**, p. 191. Anal. E. G. Radley.

## (Table 8) Differentiation — Column of Glen More Ring-Dyke as exposed in Cruach Choireadail and Coir' An T-Sailein, 2½ miles apart

| | Cruach Choireadail (Figure 54), p. 322 | | Cruach Choireadail (Figure 54), p. 322 | Cruach Choireadail (Figure 54), p. 322 | | Coir' an t-Sailein. |
|---|---|---|---|---|---|---|
| | I | II. | III | IV | V | VI |
| $SiO_2$ | 49.90 | 51.32 | 56.22 | 68.12 | 50.04 | 57.18 |
| $TiO_2$ | 2.56 | 0.98 | 2.74 | 1.26 | 2.56 | 3.25 |
| $Al_2O_3$ | 12.70 | 13.96 | 12.45 | 13.08 | 13.32 | 10.75 |
| Fe2O | 4.20 | 2.48 | 3.09 | 1.02 | 4.71 | 4.96 |
| FeO | 7.88 | 7.10 | 7.58 | 3.26 | 8.07 | 6.24 |
| MnO | 0.36 | 0.34 | 0.43 | 0.39 | 0.33 | 0.32 |
| (Co, Ni)O | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. |
| MgO | 5.88 | 5.78 | 2.78 | 0.71 | 5.01 | 2.15 |
| CaO | 10.39 | 11.51 | 5.93 | 1.81 | 10.02 | 5.73 |
| BaO | nt. fd, | nt. fd. | 0.04 | 0.04 | nt. fd. | 0.06 |

| | | | | | | |
|---|---|---|---|---|---|---|
| $Na_2O$ | 2.86 | 3.50 | 3.82 | 4.15 | 3.28 | 4.62 |
| $K_2O$ | 0.95 | 1.16 | 2.67 | 4.47 | 1.08 | 2.67 |
| Li2O | nt. fd. | nt. fd. | nt. fd. | nt. fd. | tr, | tr. |
| H2O+105° | 1.65 | 1.27 | 1.35 | 1.16 | 1.45 | 1.31 |
| H2O at 105° | 0.67 | 0.36 | 0.44 | 0.40 | 0.27 | 0.33 |
| $P_2O_5$ | 0.20 | 0.24 | 0.50 | 0.22 | 0.28 | 0.46 |
| CO2 | 0.09 | 0.09 | 0.05 | 0.06 | 0.08 | 0.08 |
| $FeS_2$ | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. |
| | 100.29 | 100.09 | 100.09 | 100.15 | 100.50 | 100.11 |
| Spec. grav. | 2.95 | 2.91 | 2.77 | 2.55 | 2.97 | 2.71 |

**I.-IV. Ascending sequence, Cruach Choireadail.**

I. (S18463) [NM 6027 2939], Lab. No. 442). Glen More Ring-Dyke. ½ mile W.N. W. of Creag na h-Iolaire, Glen More; Mull. **Quartz-Gabbro**, p. 328. Anal. E. G. Radley.

II. (S18462) [NM 5990 2974], Lab. No. 441). Glen More Ring-Dyke. Fully ½ mile S.S.E. of cairn on Cruach Choireadail; Mull. **Quartz-Gabbro**, p. 328. Anal. E. G. Radley.

III. (S18461) [NM 5967 3006], Lab. No. 440). Glen More Ring-Dyke. Fully ¼ mile S.S.E. of cairn on Cruach Choireadail; Mull. Allied to **Craignurite**, p. 328. Anal. E. G. Radley.

IV. (S18460) [NM 5959 3044], Lab. No. 439). Glen More Ring-Dyke. 130 yards E.S.E. of cairn on Cruach Choireadail; Mull. Allied to acid **Craignurite**, p. 328. Anal. E. G. Radley.

**V. and VI. Ascending Sequence Coir' an t-Sailein.**

V. (S18455) [NM 5654 3251], Lab. No. 437). Glen More Ring-Dyke. Rather more than ½ mile W. N. W. of Corra-bheinn; Mull. **Quartz-Gabbro**, p. 328. Anal. E. G. Radley.

VI (S18456) [NM 5687 3206], Lab. No 438). Glen More Ring-Dyke. Fully ¼ mile W.S.W. of Corra-bheinn; Mull. Allied to **Craignurite**, p. 328. Anal. E. G. Radley.

## (Table 9) In British Museum Students' Index, Tobermorite is listed as a synonym of Gyrolite.

| | Amygdale Minerals | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Phenocrysts | Outside Pneumatlysis Limit | | | | | | | | | Inside Pneumatlysis Limit | | | Inside Contact Zone | | Mudstone | Xenoliths and enclosed Spinel | | | |
| | I. | II. | III. | IV. | V. | VI. | VII. | VIII. | IX. | X. | XI. | XII. | XIIa | XIII | XIV | XV | XVI | XVII | XVIII | |
| $SiO_2$ | 49.72 | 50.80 | 53.74 | 53.41 | 52.95 | 53.39 | 48.91 | 46.51 | 46.62 | 46.75 | 46.21 | 46.10 | 45.9 | 38.69 | 37.66 | 39.26 | 49.74 | 38.67 | 0.77 | $SiO_2$ |
| $TiO_2$ | 0.85 | — | — | — | — | — | — | — | — | — | — | nt. fd. | — | 0.12 | 0.12 | 1.33 | 1.49 | 0.90 | 0.50 | $TiO_2$ |
| $Al_2O_3$ | 0.90 | 31.51 | 0.82 | 1.76 | 1.71 | — | 0.11 | 2.40 | 3.9 | 24.82 | 27.00 | 25.05 | 26.0 | 28.54 | 21.84 | 27.34 | 34.99 | 37.27 | 60.84 | $Al_2O_3$ |
| $Fe_2O_3$ | 1.72 | — | — | — | — | — | — | 1.14 | 0.66 | — | — | — | — | 6.97 | 4.07 | 1.57 | 1.53 | 2.78 | 4.26 | $Fe_2O_3$ |
| FeO | 27.77 | — | — | — | — | — | 2.97 | 1.85 | 1.08 | — | — | 0.55 | — | 0.22 | 0.34 | 17.18 | 0.34 | 5.07 | 24.00 | FeO |
| MnO | 0.98 | — | — | — | — | — | 2.27 | — | — | — | — | nt. fd. | — | 0.29 | 0.53 | 0.13 | 0.15 | 0.17 | 0.15 | MnO |
| (Co,Ni)O | nt. fd. | — | — | — | — | — | — | — | — | — | — | nt. fd. | — | nt. fd. | nt. fd. | 0.04 | nt. fd. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO | 12.69 | — | — | — | — | — | 0.56 | 0.47 | — | — | — | 0.32 | — | 0.49 | 0.45 | 0.34 | 0.66 | 2.35 | 9.37 | MgO |
| CaO | 3.80 | 12.83 | 31.19 | 31.69 | 31.48 | 33.41 | 40.39 | 33.40 | 33.98 | 14.20 | 13.45 | 14.17 | 14.3 | 23.78 | 33.06 | 0.74 | 0.88 | 4.65 | 0.36 | CaO |
| BaO | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | nt. fd. | nt. fd. | — | — | BaO |
| $Na_2O$ | 0.23 | 3.96 | 9.94 | 8.11 | 8.04 | 8.8 | 0.22 | 0.36 | 0.89 | 0.89 | — | tr. | — | tr. | 1.17 | 1.08 | 3.76 | 3.63 | — | $Na_2O$ |
| $K_2O$ | 0.12 | tr. | nt. fd. | 2.42 | 2.45 | — | 1.16 | 1.45 | 0.57 | — | — | 0.03 | — | 0.03 | 0.75 | 2.05 | 1.72 | 3.01 | — | $K_2O$ |
| $Li_2O$ | tr. | — | — | — | — | — | — | — | — | — | — | nt. fd. | — | tr. | 0.20 | nt. fd. | tr. | nt. fd. | — | $Li_2O$ |
| $H_2O$+105° | 1.57 | 0.52 | 3.38 | 3.66 | 4.07 | 4.46 | 4.17 | 12.61 | 12.11 | 13.64 | 13.78 | 13.78 | 13.8 | 0.99 | nt. fd. | 7.20 | 3.44 | 1.63 | 0:14 | $H_2O$+105° |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $H_2O$ at 105° | 0.08 | — | 0.6 | — | — | — | — | — | — | — | — | 013 | — | 0.09 | — | 1.44 | 0.61 | 0.22 | nt. fd. | $H_2O$ at 105° |
| $P_2O_5$ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.34 | 0.86 | — | — | $P_2O_5$ |
| $CO_2$ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | — | — | $CO_2$ |
| $FeS_2$ | — | — | — | — | — | — | | — | — | — | — | — | — | — | — | nt. fd. | nt. fd. | 1— | — | $FeS_2$ |
| | 100.19 | 99.65 | 99.67 | 101.05 | 100.67 | 100.06 | 100.76 | 100.19 | 99.81 | 98.80 | 100.44 | 100.13 | 100.0 | 100.21 | 100.19 | 100.04 | 100.21 | 100.35 | 100.39 | |
| Spec. grav. | — | — | — | — | — | — | 2.605 | — | 2.423 | — | — | 2.285 | — | 3.488 | 3.61 | — | 2.65 | 2.91 | 3.837 | Spec. grav. |

I. Uniaxial Augite. II. Labradorite. III.-VI. Pectolite. VII. Xonotlite. VIII, IX. Tobermorite.<ref>In British Museum Students' Index, Tobermorite is listed as a synonym of Gyrolite</ref> X.—XII. Scolecite. XIII. Pink Epidote. XIV. Garnet. XV. Basal Mudstone (altered). XVI. Uncontaminated argillaceous xenolith. XVII. Contaminated argillaceous xenolith. XVIII. Dark-green Spinel.

Explanation of (Table 9).

**Phenocryst in Inninmorite (Chapter 25)**

I. **Uniaxial augite**, lab. No. 402, separated from V of Table 3 Anal. E. G. Radley, quoted from A. F. Hallimond, Min. Mag., vol. xvii., 1914, p. 99.

**Phenocryst in basalt (chapter 34)**

II. **Labradorite** (? from N. W. Dyke, p. 358). S.E. of Tobermory; Mull. Collected by J. W. Judd, Quart. Journ. Geol. Soc., vol. xlii, 1886, p. 71. Anal. T. H Holland, Min. Mag., vol. viii., 1889, p. 156.

**Amygdale-minerals, collected outside limit of pneumatolysis of Plate 3 (Chapters 5 AND 10)**

**Pectolite**. Dearg Sgeir, N.W. of mouth of Loch Scridain; Mull. Quoted from M. F. Heddle, Trans. Geol. Soc. Glasgow, vol. ix., 1892, p. 244. Anal. Stuart Thomson.

IV. **Pectolite**. Same locality, M. F. Heddle, op. cit., p. 245. Anal. Stuart Thomson.

V. **Pectolite**. Same locality, M. F. Heddle, op. cit., p. 245. Anal. Stuart Thomson.

VI. **Pectolite**.. Same locality, M. F. Heddle, op. cit., p. 245. Anal. C. Robertson.

VII. **Xonotlite**. Kilfinichen, Loch Scridain; Mull. Anal. M. F. Peddle, quoted from Min. Mag., vol. v., 1884, p. 4.

VIII. **Tobermorite**. North of Tobermory Pier; Mull. Anal. M. F. Heddle, quoted from Min,. Mag., vol. iv., 1882, p. 119.

IX. **Tobermorite**. Near Lighthouse, N. of Tobermory; Mull. Anal. M. F. Heddle, quoted from Min. Mag., vol. iv., 1882, p. 120.

X. **Scolecite**. Staffa. Quoted from M. F. Heddle, Mineralogy of Scotland, 1901, vol. ii , p. 106. Anal. Fuchs & Gehlen, Schweigger's Journal, vol, xviii., 1816, g. 13.

**Amygdale-minerals, collected within limit of pneumatolysis of Plate 3, but not contact-altered (chapter 10)**

XI. **Scolecite**. Near Beinn na Croise, S.E. of Loch Scridain (locality quoted from Heddle's Mineralogy, p. 107); Mull. Anal. A. J. Scott, Ed. New. Phil. Journ., vol. liii., 1852, p. 282.

XII. **Scolecite**, Lab. No. 403. North-east slope of An Gearna; Mull. Quoted from W. F. P. M'Lintock, Trans: Roy. Soc. Edin., vol. li., 1917, p. 5. Anal. E. G. Radley.

XIIa. **Scolecite**, calculated for formula $CaAl_2Si_3O_{10}+3H_2O$.

**Amygdale-minerals, collected within contact-zone of Beinn a Ghràig granophyre (chapter 10)**

XIII. Pink **Epidote**, Lab. No. 404. N.B. slope of An Gearna; Mull. Quoted from W. F. P. M'Lintock, op. cit., p. 6. Anal. H. G. Radley.

XIV. **Garnet**, lab. No. 416. N.E. slope of An Gearna; Mull. Quoted from W. F. P. M'Lintock, op cit., p. 8. Anal. E. G. Radley.

**Basal mudstone collected within limit of pneumatolysis of Plate 3**

XV. Mudstone, lab. No. 395. At lava-base, 1 mile S. of entrance to Loch Don; Mull. Anal. E. G. Radley, pp. 58, 59.

**Loch Scridain Xenoliths (chapter 24)**

XVI. **Silliminite-Buchite**, Lab. No. 431, with 0.48 per cent. of sapphire. Uncontaminated portion of Xenolith in IX., (Table 2), Nuns' Pass, Carsaig; Mull. Quoted from H.H. Thomas, Quart. Journ. Geol. Soc., vol. laxviii., 1922, p. 236. Anal. E. G. Radley.

XVII. (16612, Lab. No. 396), **Contaminated xenolith**, with basic plagioclase, mullite, sapphire (1.45 per cent), and spinel, in same exposure as xvi. Quoted from H. H. Thomas, op. cit., p. 236. Anal. E. G. Radley.

XVIII. Dark-green **Spinel**, Lab. No. 397, between magnesian pleonaste and ferrous hercynite. Separated from XVII. Quoted from H. H. Thomas, op. cit., p. 247. Anal. E. G. Radley.

## (Table 10)—Synopsis of Mull basalts microscopically examined from 1-inch map, Sheet 44

| District | Ornament employed in Plate 3 | Number of Slides Examined | Number of Slides Examined. | Number of Slides with— | |
|---|---|---|---|---|---|
| | | Plateau Types | Central Types | Olivine fresh | Olivine all decomposed |
| Area 1 | Plateau | 16 | 1 | 15 | 2 |
| Area 2 | Plateau | 8 | 1 | 4 | 5 |
| 3 | | 6 | Nil | 5 | 1 |
| 4 | | 8 | Nil | 8 | Nil |
| 4a | | 4 | Nil | 2 | 22 |
| 5 | Central | Nil | Nil | Nil | Nil |
| 5 | Plateau | 60 | 60 | Nil | 60 |
| 6 | Central | 2 | 36 | Nil | 3 |
| 6 | Plateau | 38 | 6 | Nil | 42 |
| 7 | Central | 2 | 21 | Nil | 5 |
| 7 | Plateau | 17 | 1 | Nil | 18 |
| 8 | Central | 1 | 5 | Nil | 1 |
| 8 | Plateau | 107 | 5 | Nil | 112 |
| 9 | Central | Nil | 2 | Nil | Nil |
| 9 | Plateau | 52 | 8 | Nil | 62 |
| 10 | | Nil | 74 | Nil | 33 |
| Sheet 44 (inclusive) | Central | 5 | 139 | | |
| Sheet 44 (inclusive) | Plateau | 316 | 23 | | |

Areas 1.4A lie outside the Pneumatolysis Limit. They supply 44 slides, showing olivine (or its pseudomorphs); and in 34 cases the mineral is fresh. Areas 510 lie inside the Pneumatolysis Limit. They supply 336 slides, showing pseudomorphs after olivine, and none in which fresh olivine has been noted.

None of the sliced specimens mentioned was collected with a view to determining the condition of the olivine.

## (Table 11) Water of augite-andesites

| | Ia | Ib | IIa | IIb | IIIa | IIIb | IV | V | |
|---|---|---|---|---|---|---|---|---|---|
| $SiO_2$ | 61.69 | 59.21 | | | | | 62.37 | 64.13 | $SiO_2$ |
| $H_2O$+105° | 2.36 | 1.54 | 2.38 | 1.56 | 2.44 | 0.93 | 5.54 | 2.71 | $H_2O$+105° |
| $H_2O$ at 105° | 0.25 | 2.05 | 0.45 | 1.34 | 0.38 | 1.64 | 0.44 | 0.36 | $H_2O$ at 105° |
| Cl | 0.02 | nt. fd. | | | | | | | Cl |
| Spec. grav. | 2.64 | 2.61 | 2.82 | 2.17 | 2.89 | 2.71 | 2.50 | 2.57 | Spec. grav. |

Analyses by E. G. Radley, quoted from E. M. Anderson and E. G. Radley, Quart. Journ. Geol. Soc., vol. lxxi., p. 212.

Ia, Ib (S15996) [NM 5021 2337] and (S15997) [NM 5021 2337]; Lab. Nos. 384, 385). Glassy (a) and stony (b) portions of **Leidleite** sill, ¼ mile N.N.E. of cairn on Mullach Glac an t'Sneachda. (Locality 1, (Figure 43); complete Anals. III. and II., (Table 3), p. 19).

IIa, IIb. (S17243) [NM 5018 2359] and (S17244) [NM 5018 2359]; Lab. Nos. 417, 418). Glassy (a) and stony (b) portions of **Leidleite** sill, 730 yds. N.N.E. of cairn on Mullach Glac an t'Sneachda. (Locality 2, (Figure 43))

IIIa, IIIb. (S17245) [NM 5057 2261] and (S17246) [NM 5057 2261]; Lab. Nos. 419, 420). Glassy (a) and stony (5) portions of **Leidleite** Sill, 1000 yds. S. E. of cairn on Mullach Glac an t'Sneachda. (Locality 3, (Figure 43))

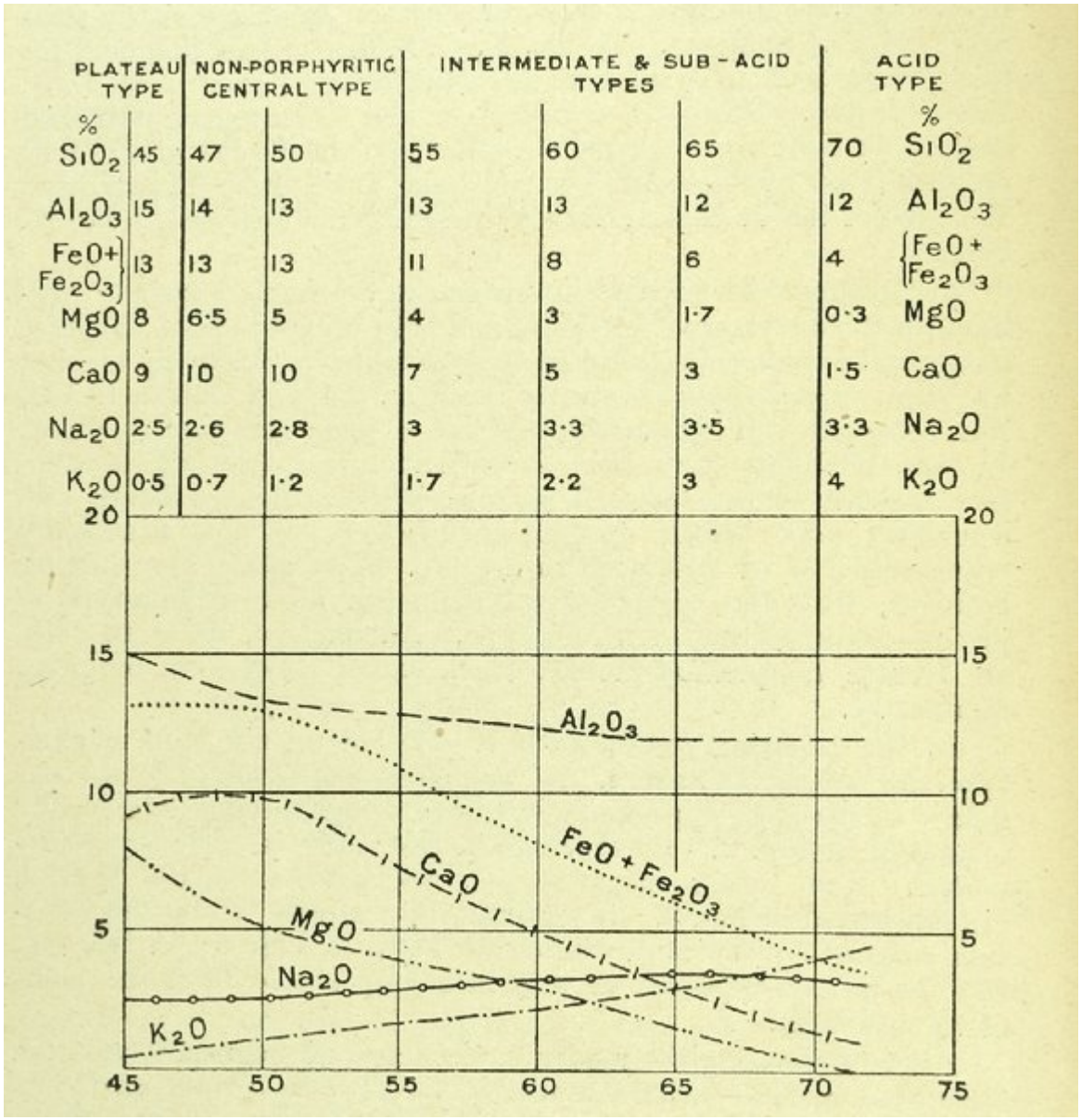
IV (S15989) [NM 5077 2552]; Lab. No. 286). Extremely glassy **Inninmorite** sheet, near head of stream from Tòm a' Choilich. (Locality 4, (Figure 43); complete Anal. IV., (Table 3). p. 19)

V. (S15990) [NM 5176 2404]; Lab. No. 387). Fairly crystalline **Inninmorite** sheet with glassy base, 3/16 mile S.W. of Trig. Station on Beinn an Lochain. (Locality 5, (Figure 43); complete Anal. V. (Table 3), p. 19)

TABLE I. : PLATEAU MAGMA-TYPE OF FIG. 2.

| | A | B | I. | II. | III. | C | D | E | |
|---|---|---|---|---|---|---|---|---|---|
| $SiO_2$ | 43·94 | 45·24 | 45·37 | 45·48 | 45·52 | 46·46 | 46·61 | 47·64 | $SiO_2$ |
| $TiO_2$ | 2·45 | 2·26 | 2·87 | 3·48 | 2·85 | 2·07 | 1·81 | 1.27 | $TiO_2$ |
| $Al_2O_3$ | 14·03 | 15·63 | 15·16 | 15·66 | 14·30 | 15·48 | 15·32 | 14·15 | $Al_2O_3$ |
| $Cr_2O_3$ | tr. | tr. | ... | ... | ... | 0·02 | tr. | 0·01 | $Cr_2O_3$ |
| $V_2O_3$ | ... | ... | ... | ... | ... | 0·05 | ... | 0·06 | $V_2O_3$ |
| $Fe_2O_3$ | 1·95 | 5·56 | 3·38 | 3·64 | 3·43 | 3·63 | 3·49 | 5·18 | $Fe_2O_3$ |
| FeO | 11·65 | 7·19 | 11·58 | 10·56 | 9·00 | 10·23 | 7·71 | 7·96 | FeO |
| MnO | 0·32 | 0·23 | 0·31 | 0·20 | 0·19 | 0·48 | 0·13 | 0 33 | MnO |
| (Co,Ni)O | nt. fd. | tr. | nt. fd. | ... | ... | 0·02 | tr. | tr. | (Co,Ni)O |
| MgO | 10·46 | 7·82 | 6·72 | 6·99 | 10·65 | 6·89 | 8·66 | 7·38 | MgO |
| CaO | 8·99 | 9·38 | 8·11 | 8·24 | 9·54 | 9·05 | 10·08 | 11·71 | CaO |
| (Ba,Sr)O | nt. fd. | ... | nt. fd. | .. | ... | 0·02 | ... | nt. fd. | (Ba,Sr)O |
| $Na_2O$ | 2·68 | 2·01 | 2·90 | 2·68 | 2·21 | 3·01 | 2·43 | 2·38 | $Na_2O$ |
| $K_2O$ | 0·33 | 0 72 | 0.44 | 0·49 | 0·42 | 0·68 | 0·67 | 0·71 | $K_2O$ |
| $Li_2O$ | nt. fd. | ... | nt. fd. | nt. fd. | nt. fd. | ? tr. | ... | ... | $Li_2O$ |
| $H_2O+105°$ | 2·31 | 2·21 | 1·96 | 1·52 | 1·53 | 1·43 | 2·07 | 1.44 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·85 | 1·12 | 1·18 | 0·93 | 0·70 | 0·89 | 1·10 | 0·19 | $H_2O$ at 105° |
| $P_2O_5$ | 0·20 | 0·20 | 0·29 | 0·26 | 0·23 | 0·30 | tr. | 0·09 | $P_2O_5$ |
| $CO_2$ | 0·16 | 0·49 | ... | 0·21 | 0·15 | nt. fd. | tr. | ... | $CO_2$ |
| $FeS_2$ | 0·04 | ... | ... | ... | ... | ... | ... | ... | $FeS_2$ |
| $Fe_7S_8$ | 0·06 | ... | ... | ... | ... | ... | ... | ... | $Fe_7S_8$ |
| $\frac{1}{2}S$ | ... | ... | ... | ... | ... | 0·08 | ... | ... | $\frac{1}{2}S$ |
| S | ... | ... | ... | nt. fd. | nt. fd. | ... | ... | 0·03 | S |
| | 100·42 | 100 06 | 100·27 | 100·34 | 100·72 | 100·70 | 100·08 | 100·53 | ... |
| Spec. grav. | ... | 2·85 | 2·95 | 2·93 | 2·99 | ... | 2·87 | ... | ... |

*(Table 1) Plateau Magma-Type of Figure 2*




*(Figure 2) Variation-diagram: Normal Mull Magma-Series.*

TABLE II.—Non-Porphyritic Central Magma-Type of Fig. 2.

| | Tholeiite Salen Type | Basalt Staffa Type | | | Basalt Compact Central Type | | Tholeiite Brunton Type | | Quartz-Dolerite and Tholeiite Talaidh Type | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | I. | II. | III. | A | IV. | V. | VI. | VII. | VIII. | IX. | |
| $SiO_2$ | 47·35 | 47·80 | 49·76 | 52·13 | 50·54 | 53·78 | 51·53 | 51·63 | 52·16 | 53·97 | $SiO_2$ |
| $TiO_2$ | 1·75 | .... | 0·94 | .... | 2·80 | 2·28 | 1·57 | 2·00 | 3·25 | 1·24 | $TiO_2$ |
| $Al_2O_3$ | 13·90 | 14·80 | 14·42 | 14·87 | 12·86 | 12·69 | 11·05 | 11·77 | 11·95 | 14·65 | $Al_2O_3$ |
| $Fe_2O_3$ | 5·87 | .... | 3·95 | .... | 4·13 | 3·44 | 2·73 | 3·23 | 4·86 | 3·62 | $Fe_2O_3$ |
| FeO | 8·96 | 13·08 | 7·77 | 11·40 | 8·75 | 8·94 | 10·98 | 10·47 | 9·92 | 6·32 | FeO |
| MnO | 0·23 | 0·09 | 0·20 | 0·32 | 0·32 | 0·53 | 0·45 | 0·35 | 0·18 | 0·30 | MnO |
| (Co, Ni)O | nt. fd. | .... | nt. fd. | .... | 0·06 | nt. fd. | nt. fd. | 0·04 | .... | nt. fd. | (Co, Ni)O |
| MgO | 5·97 | 6·84 | 5·30 | 6·46 | 4·63 | 2·58 | 5·21 | 5·02 | 3·77 | 4·49 | MgO |
| CaO | 10·65 | 12·89 | 10·22 | 10·56 | 8·71 | 6·36 | 9·68 | 9·34 | 7·14 | 7·98 | CaO |
| BaO | .... | .... | 0·04 | .... | nt. fd. | 0·09 | nt. fd. | 0·03 | .... | 0·04 | BaO |
| $Na_2O$ | 2·73 | 2·48 | 2·49 | 2·60 | 2·89 | 2·74 | 3·48 | 2·90 | 2·36 | 2·54 | $Na_2O$ |
| $K_2O$ | 0·54 | 0·86 | 1·83 | 0·69 | 1·43 | 2·27 | 0·86 | 0·91 | 1·74 | 1·52 | $K_2O$ |
| $Li_2O$ | .... | .... | tr. | .... | nt. fd. | nt. fd. | tr. | nt. fd. | .... | tr. | $Li_2O$ |
| $H_2O - 105°$ | 1·16 | 1·41 | 1·03 | 1·19 | 2·25 | 2·19 | 1·26 | 1·40 | 1·95 | 0·94 | $H_2O$ : 105° |
| $H_2O$ at 105° | 1·04 | | 2·04 | | 0·17 | 1·19 | 0·71 | 0·68 | 0·56 | 1·92 | $H_2O$ at 105° |
| $P_2O_5$ | 0·24 | .... | 0·21 | .... | 0·34 | 0·55 | 0·22 | 0·29 | 0·24 | 0·27 | $P_2O_5$ |
| $CO_2$ | 0·32 | .... | 0·06 | .... | 0·33 | 0·08 | 0·08 | 0·11 | 0·18 | 0·51 | $CO_2$ |
| $FeS_2$ | .... | .... | 0·04 | .... | nt. fd. | 0·42 | 0·26 | 0·08 | .... | 0·09 | $FeS_2$ |
| S | 0·23 | .... | .... | .... | .... | .... | .... | .... | 0·18 | .... | S |
| | 100·91 | 100·25 | 100·30 | 100.22 | 100·24 | 100·13 | 100·07 | 100·27 | 100·44 | 100·40 | |
| Spec. grav. | 2·96 | .... | 2·72 | .... | 2·90 | 2·68 | 2·93 | 2·95 | 2·91 | 2·83 | |

*(Table 2) Non-Porphyritic Central Magma-Type of Figure 2*

TABLE III.—Intermediate to Subacid Magma-Type of Fig. 2.

| | Craignurite (basic) | Leidleite | | Inninmorite | | Craignurite (acid) | |
|---|---|---|---|---|---|---|---|
| | I. | II. | III. | IV. | V. | VI. | |
| $SiO_2$ . . | 55·82 | 59·21 | 61·69 | 62·37 | 64·13 | 66·27 | $SiO_2$ |
| $TiO_2$ . . | 1·62 | 1·06 | 1·00 | 1·06 | 1·19 | 0·87 | $TiO_2$ |
| $Al_2O_3$ . . | 11·47 | 14·06 | 14·43 | 12·04 | 13·15 | 11·92 | $Al_2O_3$ |
| $Fe_2O_3$ . . | 3·68 | 2·66 | 1·23 | 1·87 | 1·08 | 3·09 | $Fe_2O_3$ |
| FeO . . | 7·66 | 4·87 | 5·86 | 5·81 | 6·31 | 3·18 | FeO |
| MnO . . | 0·40 | 0·24 | 0·30 | 0·24 | 0·27 | 0·31 | MnO |
| (Co,Ni)O . | 0·04 | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO . . | 4·08 | 3·71 | 2·81 | 0·97 | 1·08 | 1·44 | MgO |
| CaO . . | 7·88 | 5·95 | 4·97 | 3·51 | 3·62 | 3·30 | CaO |
| BaO . . | 0·03 | 0·03 | 0·04 | 0·07 | 0·09 | nt. fd. | BaO |
| $Na_2O$ . | 2·58 | 2·06 | 3·20 | 3·47 | 3·64 | 2·89 | $Na_2O$ |
| $K_2O$ . . | 2·00 | 2·83 | 1·72 | 2·34 | 2·32 | 4·03 | $K_2O$ |
| $Li_2O$ . . | tr. | nt. fd. | nt. fd. | nt fd. | nt. fd. | tr. | $Li_2O$ |
| $H_2O+105°$. | 1·88 | 1·49 | 2·32 | 5·54 | 2·71 | 1·51 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·66 | 2·06 | 0·25 | 0·44 | 0·36 | 0·78 | $H_2O$ at 105° |
| $P_2O_5$ . . | 0·23 | 0·20 | 0·24 | 0·30 | 0·31 | 0·17 | $P_2O_5$ |
| $Co_2$ . . | 0·08 | ... | ... | ... | ... | 0·53 | $Co_2$ |
| $FeS_2$ . . | 0·09 | nt. fd. | nt. fd. | nt fd. | nt. fd. | nt. fd. | $FeS_2$ |
| Cl . . | ... | nt. fd. | 0·02 | ... | ... | ... | Cl |
| | 100·18 | 100·43 | 100·08 | 100·03 | 100·26 | 100·29 | |
| Spec. grav. | 2·88 | 2·61 | 2·64 | 2·50 | 2·57 | 2·65 | |

*(Table 3) Intermediate to Subacid Magma-Type of Figure 2*

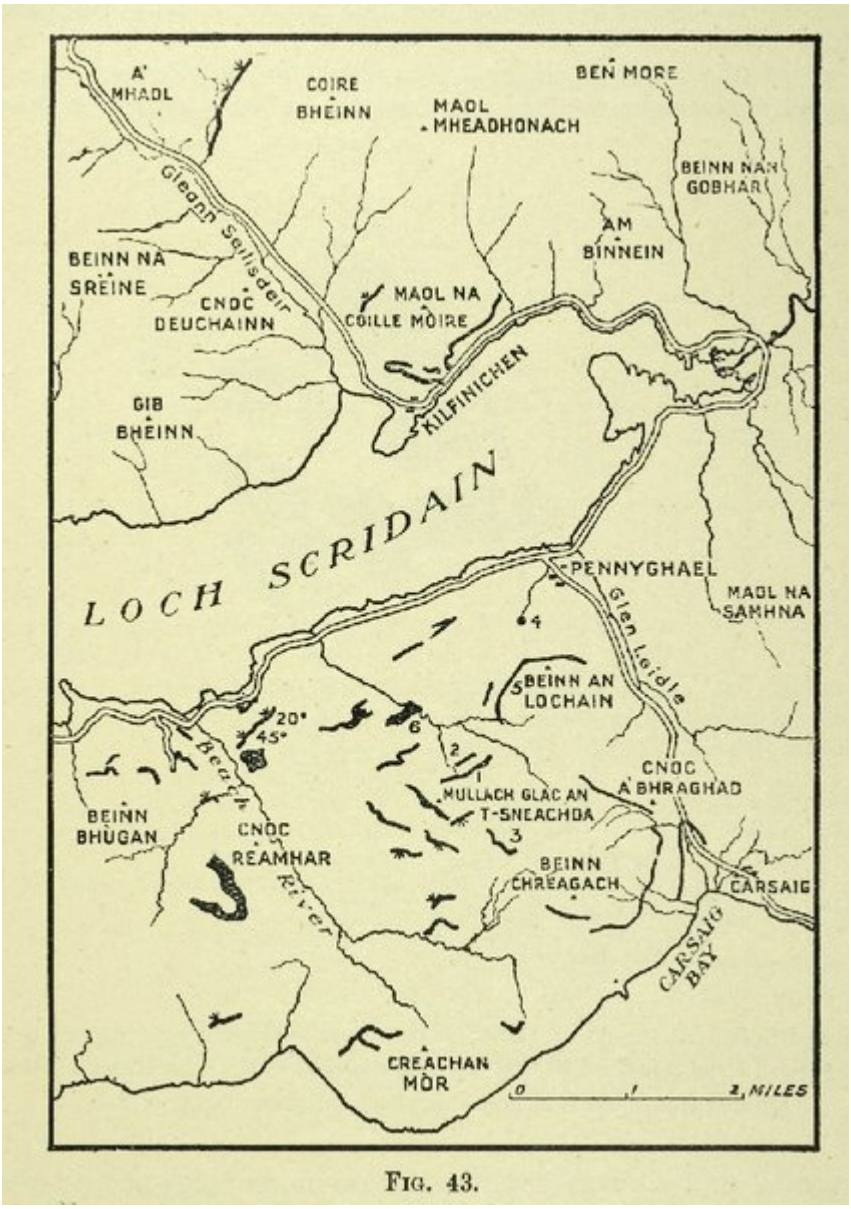



FIG. 43.

*(Figure 43) Map of some of the occurrences of Pitchstone in Loch Scridain district. Quoted from Quart. Journ. Geol. Soc., vol. lxai., 1916, p. 206.*

TABLE IV.—Acid Magma-Type of Fig. 2.

| | I. | II. | III. | IV. | V. | |
|---|---|---|---|---|---|---|
| $SiO_2$ | 70·70 | 71·30 | 72·66 | 73·12 | 73·32 | $SiO_2$ |
| $TiO_2$ | 1·27 | 0·58 | 0·34 | 0·39 | 0·51 | $TiO_2$ |
| $Al_2O_3$ | 11·78 | 11·24 | 12·00 | 12·44 | 12·25 | $Al_2O_3$ |
| $Fe_2O_3$ | 1·32 | 1·80 | 2·03 | 2·09 | 2·77 | $Fe_2O_3$ |
| FeO | 3·45 | 2·84 | 2·04 | 1·65 | 2·20 | FeO |
| MnO | 0·07 | 0·31 | 0·18 | 0·17 | 0·12 | MnO |
| (Co,Ni)O | ... | nt. fd. | nt. fd. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO | 0·53 | 0·61 | 0·07 | 0·14 | 0·11 | MgO |
| CaO | 1·30 | 1·56 | 1·25 | 0·88 | 1·65 | CaO |
| BaO | ... | 0·07 | 0·12 | nt. fd. | 0·09 | BaO |
| $Na_2O$ | 2·48 | 3·44 | 3·26 | 3·90 | 3·92 | $Na_2O$ |
| $K_2O$ | 4·71 | 4·66 | 5·26 | 4·67 | 2·34 | $K_2O$ |
| $Li_2O$ | ... | ? tr. | nt. fd. | nt. fd. | nt. fd. | $Li_2O$ |
| $H_2O+105°$ | 1·14 | 1·04 | 0·47 | 0·24 | 0·35 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·50 | 0·39 | 0·22 | 0·25 | 0·35 | $H_2O$ at 105° |
| $P_2O_5$ | 0·26 | 0·22 | 0·04 | 0·09 | 0·10 | $P_2O_5$ |
| $CO_2$ | 0·51 | ... | 0·24 | 0·05 | 0·06 | $CO_2$ |
| $FeS_2$ | ... | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $FeS_2$ |
| S | 0·08 | ... | ... | ... | ... | S |
| | 100·10 | 100·06 | 100·18 | 100·08 | 100·14 | |
| Spec. grav. | 2·58 | 2·53 | 2·61 | 2·57 | 2·66 | |

*(Table 4) Acid Magma-type of Figure 2*

TABLE V.—ALLIVALITE—EUCRITE MAGMA SERIES OF FIG. 3.

| | Allivalite | Eucrite | | |
|---|---|---|---|---|
| | A | I. | B | |
| $SiO_2$ | 42·20 | 46·66 | 48·05 | $SiO_2$ |
| $TiO_2$ | 0·09 | 0·47 | 0·49 | $TiO_2$ |
| $Al_2O_3$ | 17·56 | 16·71 | 15·35 | $Al_2O_3$ |
| $Cr_2O_3$ | 0·06 | ... | 0·14 | $Cr_2O_3$ |
| $Fe_2O_3$ | 1·20 | 2·69 | 1·86 | $Fe_2O_3$ |
| FeO | 6·33 | 5·87 | 7·53 | FeO |
| MnO | 0·18 | 0·12 | 0·28 | MnO |
| (Co, Ni)O | 0·13 | ... | 0·11 | (Co, Ni)O |
| CuO | 0·04 | ... | 0·05 | CuO |
| MgO | 20·38 | 12·36 | 12·53 | MgO |
| CaO | 9·61 | 12·57 | 11·02 | CaO |
| $Na_2O$ | 1·11 | 1·16 | 1·26 | $Na_2O$ |
| $K_2O$ | 0·11 | 0·27 | 0·19 | $K_2O$ |
| $Li_2O$ | ... | nt. fd. | ... | $Li_2O$ |
| $H_2O+105°$ | 1·13 | 1·24 | 0·45 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·06 | 0·13 | 0·15 | $H_2O$ at 105° |
| $P_2O_5$ | ... | 0·13 | ... | $P_2O_5$ |
| $CO_2$ | tr. | 0·18 | 0·44 | $CO_2$ |
| S | 0·02 | nt. fd. | 0·20 | S |
| | 100·21 | 100·56 | 100·10 | |
| Spec. grav. | 2·96 | 2·97 | 2·95 | |

*(Table 5) Allivalite-Eucrite Magma Series of Figure 3*

TABLE VI.—Porphyritic Central Magma-Type of Fig. 3.

| | Dolerite | Gabbro | | | Basalt | | | |
|---|---|---|---|---|---|---|---|---|
| | I. | A | B | II. | III. | IV. | V. | |
| $SiO_2$ | 45·54 | 46·39 | 47·28 | 48·34 | 47·24 | 47·49 | 48·51 | $SiO_2$ |
| $TiO_2$ | 1·06 | 0·26 | 0·28 | 0·95 | 1·46 | 0·93 | 1·46 | $TiO_2$ |
| $Al_2O_3$ | 23·39 | 26·34 | 21·11 | 20·10 | 18·55 | 21·46 | 19·44 | $Al_2O_3$ |
| $Cr_2O_3$ | ... | tr. | ... | ... | ... | ... | ... | $Cr_2O_3$ |
| $Fe_2O_3$ | 1·98 | 2·02 | 3·52 | 1·97 | 6·02 | 1·72 | 5·66 | $Fe_2O_3$ |
| FeO | 6·98 | 3·15 | 3·91 | 6·62 | 4·06 | 4·80 | 4·00 | FeO |
| MnO | 0·27 | 0·14 | 0·15 | 0·32 | 0·31 | 0·15 | 0·23 | MnO |
| (Co,Ni)O | ... | ... | ... | nt. fd. | 0·05 | 0·04 | 0·04 | (Co,Ni)O |
| MgO | 4·60 | 4·82 | 8·06 | 5·49 | 5·24 | 4·59 | 5·12 | MgO |
| CaO | 11·82 | 15·29 | 13·42 | 13·16 | 11·72 | 13·24 | 12·03 | CaO |
| BaO | ... | ... | ... | 0·10 | nt. fd | nt. fd. | nt. fd. | BaO |
| $Na_2O$ | 2·50 | 1·63 | 1·52 | 1·66 | 2·42 | 2·17 | 2·53 | $Na_2O$ |
| $K_2O$ | 0·44 | 0·20 | 0·29 | 0·98 | 0·15 | 0·42 | 0·25 | $K_2O$ |
| $Li_2O$ | ... | ... | ... | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $Li_2O$ |
| $H_2O+105°$ | 0·72 | 0·48 | 0·53 | 0·44 | 2·24 | 2·54 | 0·48 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·62 | 0·10 | 0·13 | 0·02 | 0·21 | 0·17 | 0·04 | $H_2O$ at 105° |
| $P_2O_5$ | 0·13 | tr. | tr. | 0·04 | 0·26 | 0·43 | 0·16 | $P_2O_5$ |
| $CO_2$ | ... | ... | ... | 0·11 | 0·19 | 0·08 | 0·09 | $CO_2$ |
| $FeS_2$ | ... | ... | ... | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $FeS_2$ |
| | 100·05 | 100·82 | 100·20 | 100·30 | 100·12 | 100·23 | 100·04 | |
| Spec. grav. | 2·85 | 2·85 | 2·90 | 2·93 | 2·85 | 2·82 | 2·93 | |

*(Table 6) Porphyritic Central Magma-Type of Figure 3*

TABLE VII.—Alkaline Magma-Series of Fig. 4.

| | Mugearite | | | | Syenite | Trachyte | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | I. | II. | III. | IV. | |
| $SiO_2$ | 49·24 | 49·92 | 50·70 | 55·76 | 58·81 | 60·13 | 63·12 | $SiO_2$ |
| $TiO_2$ | 1·84 | 2·04 | 1·89 | 1·78 | 0·76 | 0·73 | 0·51 | $TiO_2$ |
| $Al_2O_3$ | 15·84 | 12·83 | 14·60 | 16·55 | 14·81 | 16·53 | 15·44 | $Al_2O_3$ |
| $Cr_2O_3$ | tr. | tr. | .. | ... | ... | ... | ... | $Cr_2O_3$ |
| $V_2O_3$ | ... | 0·04 | ... | ... | ... | ... | ... | $V_2O_3$ |
| $Fe_2O_3$ | 6·09 | 6·96 | 5·23 | 3·10 | 4·58 | 2·86 | 1·73 | $Fe_2O_3$ |
| FeO | 7·18 | 6·21 | 7·68 | 6·02 | 4·21 | 2·55 | 3·53 | FeO |
| MnO | 0·29 | 0·52 | 0·42 | 0·22 | 0·27 | 0·46 | 0·27 | MnO |
| (Co,Ni)O | tr. | 0·03 | tr. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | (Co,Ni)O |
| MgO | 3·02 | 3·78 | 4·15 | 1·08 | 0·80 | 1·20 | 0·62 | MgO |
| CaO | 5·26 | 7·25 | 7·20 | 3·23 | 2·33 | 1·61 | 1·31 | CaO |
| BaO | 0·09 | 0·09 | 0·08 | 0·07 | 0·03 | 0·11 | nt. fd. | BaO |
| SrO | tr. | tr. | tr. | ... | ... | ... | ... | SrO |
| $Na_2O$ | 5·21 | 3·72 | 3·71 | 6·28 | 5·60 | 8·06 | 5·81 | $Na_2O$ |
| $K_2O$ | 2·10 | 1·73 | 1·33 | 3·87 | 4·96 | 3·99 | 5·36 | $K_2O$ |
| $Li_2O$ | ... | tr. | ? tr. | tr. | nt. fd. | tr. | nt. fd. | $Li_2O$ |
| $H_2O+105°$ | 1·61 | 1·05 | 1·15 | 0·95 | 0·82 | 0·97 | 0·44 | $H_2O+105°$ |
| $H_2O$ at 105° | 1·08 | 3·58 | 2·08 | 0·80 | 2·00 | 0·55 | 0·14 | $H_2O$ at 105° |
| $P_2O_5$ | 1·47 | 0·45 | 0·49 | 0·40 | 0·20 | 0·57 | 0·25 | $P_2O_5$ |
| $CO_2$ | ... | nt. fd. | nt. fd. | 0·03 | ... | ... | 1·89 | $CO_2$ |
| $FeS_2$ | ... | ... | ... | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $FeS_2$ |
| S | 0·03 | ? tr. | nt. fd. | ... | ... | ... | ... | S |
| F | 0·18 | ... | ... | ... | ... | ... | ... | F |
| | 100·46* | 100·20 | 100·71 | 100·14 | 100·18 | 100·32 | 100·42 | |
| Spec. grav | 2·79 | ... | ... | 2·67 | 2·64 | 2·51 | 2·89 | |

*(Table 7) Alkaline Magma-Series of Figure 4*

| | Cruach Choireadail, Fig. 54, p. 322. | | | | Coir' an t-Sailein. | | |
|---|---|---|---|---|---|---|---|
| | I. | II. | III. | IV. | V. | VI. | |
| $SiO_2$ . . | 49·90 | 51·32 | 56·22 | 68·12 | 50·04 | 57·18 | $SiO_2$ |
| $TiO_2$ . . | 2·56 | 0·98 | 2·74 | 1·26 | 2·56 | 3·25 | $TiO_2$ |
| $Al_2O_3$ . . | 12·70 | 13·96 | 12·45 | 13·08 | 13·32 | 10·75 | $Al_2O_3$ |
| $Fe_2O_3$ . . | 4·20 | 2·48 | 3·09 | 1·02 | 4·71 | 4·96 | $Fe_2O_3$ |
| FeO . . | 7·88 | 7·10 | 7·58 | 3·26 | 8·07 | 6·24 | FeO |
| MnO . . | 0·36 | 0·34 | 0·43 | 0·39 | 0·33 | 0·32 | MnO |
| (Co, Ni)O . | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | (Co, Ni)O |
| MgO . . | 5·88 | 5·78 | 2·78 | 0·71 | 5·01 | 2·15 | MgO |
| CaO . . | 10·39 | 11·51 | 5·93 | 1·81 | 10·02 | 5·73 | CaO |
| BaO . . | nt. fd, | nt. fd. | 0·04 | 0·04 | nt. fd. | 0·06 | BaO |
| $Na_2O$ . . | 2·86 | 3·50 | 3·82 | 4·15 | 3·28 | 4·62 | $Na_2O$ |
| $K_2O$ . . | 0·95 | 1·16 | 2·67 | 4·47 | 1·08 | 2·67 | $K_2O$ |
| $iL_2O$ . . | nt. fd. | nt. fd. | nt. fd. | nt. fd. | tr. | tr. | $Li_2O$ |
| $H_2O + 105°$ . | 1·65 | 1·27 | 1·35 | 1·16 | 1·45 | 1·31 | $H_2O + 105°$ |
| $H_2O$ at 105° | 0·67 | 0·36 | 0·44 | 0·40 | 0·27 | 0·33 | $H_2O$ at 105° |
| $P_2O_5$ . . | 0·20 | 0·24 | 0·50 | 0·22 | 0·28 | 0·46 | $P_2O_5$ |
| $CO_2$ . . | 0·09 | 0·09 | 0·05 | 0·06 | 0·08 | 0·08 | $CO_2$ |
| $FeS_2$ . . | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | nt. fd. | $FeS_2$ |
| | 100·29 | 100·09 | 100·09 | 100·15 | 100·50 | 100·11 | |
| Spec. grav. . | 2·95 | 2·91 | 2·77 | 2·55 | 2·97 | 2·71 | |

I.–IV. Ascending Sequence, Cruach Choireadail.

*(Table 8) Differentiation — Column of Glen More Ring-Dyke as exposed In Cruach Choireadail and Coir' An T-Sailein, 2½ miles apart*

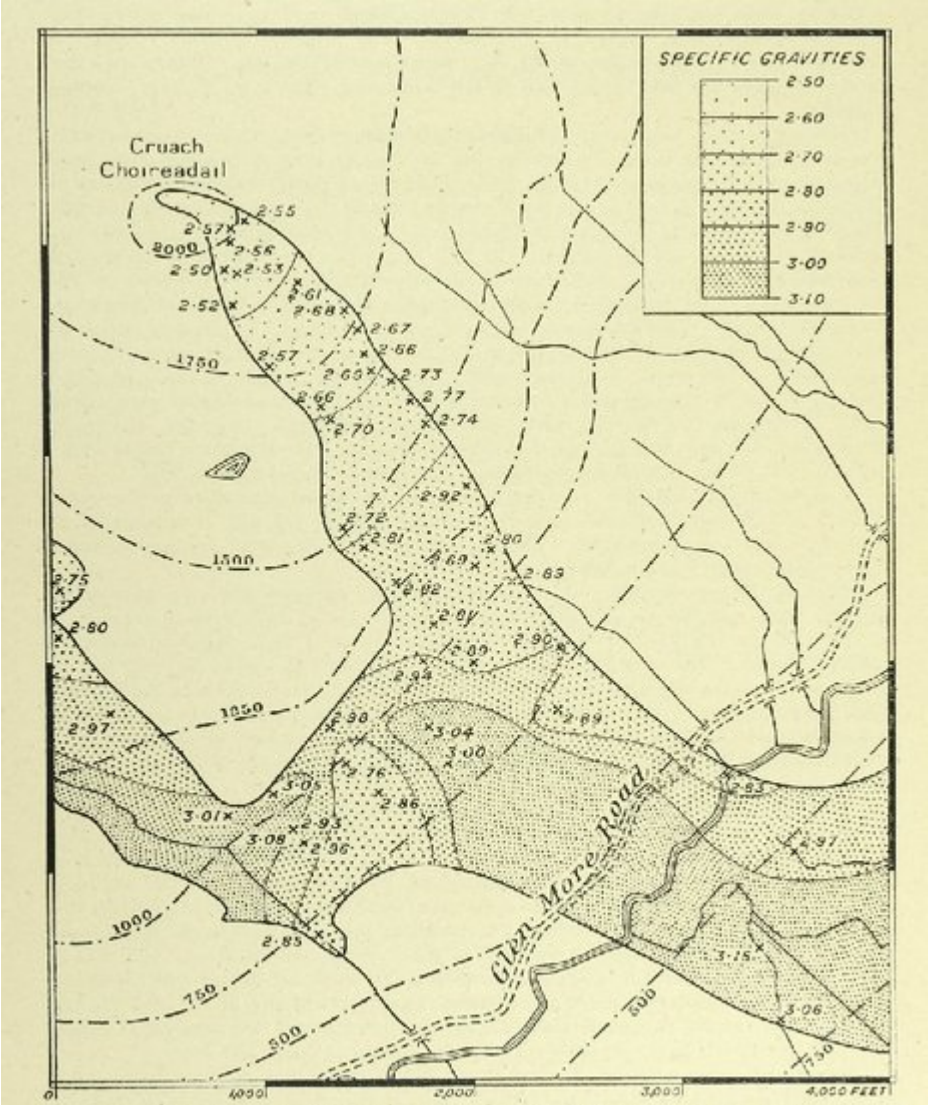



FIG. 54.—Map showing Density-Stratification in differentiated Ring-Dyke, Cruach Choireadail, Glen More (Locality 1). The extreme products exposed are olivine-bearing quartz-gabbro and granophyre.

*(Figure 54) Map showing Density-Stratification in differentiated Ring-Dyke, Cruach Choireadail, Glen More (Locality 1). The extreme products exposed are olivine-bearing quartz-gabbro and granophyre.*

TABLE IX.

| | Phenocrysts | | Amygdale—Minerals | | | | | | | | | | | | Mud-Stone | Xenoliths and nucleus Spilsd | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Outside Pneumatolysis Limit | | | | | | | | Inside Pneumatolysis Limit | | | Inside Contact-Zone | | | | | |
| | I. | II. | III. | IV. | V. | VI. | VII. | VIII. | IX. | X. | XI. | XII. | XIIa. | XIII. | XIV. | XV. | XVI. | XVII. | XVIII. | |
| $SiO_2$ | 49·72 | 50·80 | 53·74 | 53·41 | 52·95 | 53·29 | 48·91 | 48·51 | 49·62 | 48·75 | 48·21 | 48·10 | 45·8 | 58·60 | 57·66 | 57·26 | 49·74 | 58·67 | 0·77 | $SiO_2$ |
| $TiO_2$ | 0·85 | — | — | — | — | — | 0·11 | 2·40 | 3·00 | 2·82 | 2·00 | nt. fd. | — | 0·12 | 0·12 | 1·52 | 0·49 | 0·90 | 0·50 | $TiO_2$ |
| $Al_2O_3$ | 0·90 | 31·04 | 0·82 | 1·76 | 1·71 | — | 0·11 | 2·40 | 3·00 | 2·82 | 2·00 | 25·05 | 2·0 | 25·51 | 21·21 | 27·34 | 31·69 | 37·27 | 0·781 | $Al_2O_3$ |
| $Fe_2O_3$ | 1·72 | — | — | — | — | — | 1·14 | 0·61 | — | — | — | — | — | 0·07 | 1·07 | 1·57 | 1·53 | 2·78 | 1·25 | $Fe_2O_3$ |
| FeO | 17·77 | — | — | — | — | — | 2·07 | 1·85 | 1·08 | — | — | 0·15 | — | 0·22 | 0·34 | 12·15 | 4·34 | 3·07 | 2·493 | FeO |
| MnO | 0·08 | — | — | — | — | — | 0·27 | — | — | — | — | nt. fd. | — | 0·19 | 0·03 | 0·13 | 0·13 | 0·17 | 0·15 | MnO |
| (Co, Ni)O | nt. fd. | — | — | — | — | — | — | — | — | — | — | nt. fd. | — | nt. fd. | nt. fd. | 0·04 | nt. fd. | nt. fd. | nt. fd. | (Co, Ni)O |
| MgO | 12·69 | — | — | — | — | — | 0·06 | 0·47 | — | — | — | 0·32 | — | 0·40 | 0·45 | 0·34 | 0·66 | 2·35 | 0·37 | MgO |
| CaO | 3·69 | 12·83 | 21·19 | 21·60 | 21·48 | 23·41 | 10·39 | 23·49 | 23·05 | 15·90 | 15·45 | 14·17 | 14·3 | 22·79 | 23·06 | 0·74 | 9·88 | 4·85 | 0·36 | CaO |
| BaO | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | nt. fd. | nt. fd. | — | — | BaO |
| $Na_2O$ | 0·23 | 3·56 | 0·94 | 0·11 | 0·04 | 0·89 | 0·32 | 0·36 | 0·80 | 0·89 | — | tr. | — | tr. | 1·17 | 1·06 | 2·74 | 0·61 | — | $Na_2O$ |
| $K_2O$ | 0·12 | tr. | nt. fd. | 2·43 | 2·47 | — | 1·16 | 1·15 | 0·57 | — | — | 0·03 | — | 0·03 | 0·73 | 2·05 | 1·72 | 3·01 | — | $K_2O$ |
| $Li_2O$ | tr. | — | — | — | — | — | — | — | — | — | — | nt. fd. | — | tr. | nt. fd. | nt. fd. | tr. | nt. fd. | — | $Li_2O$ |
| $H_2O$ −105° | 1·57 | 0·23 | 2·38 | 5·66 | 4·07 | 4·16 | 4·17 | 12·91 | 12·11 | 15·04 | 15·78 | 15·78 | 15·8 | 0·89 | 0·29 | 7·20 | 3·44 | 1·05 | 0·14 | $H_2O$+105° |
| $H_2O$ at 105° | 0·08 | — | 0·6 | — | — | — | — | — | — | — | — | 0·15 | — | 0·09 | nt. fd. | 1·44 | 0·61 | 0·22 | nt. fd. | $H_2O$ at 130° |
| $P_2O_5$ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0·24 | 0·80 | — | — | $P_2O$ |
| $CO_2$ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0·04 | — | — | $CO_2$ |
| FeS | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | nt. fd. | nt. fd. | — | — | FeS |
| | 100·13 | 99·05 | 99·67 | 101·05 | 100·67 | 100·06 | 100·76 | 100·10 | 99·81 | 99·80 | 100·44 | 100·13 | 100·0 | 100·21 | 100·19 | 100·04 | 100·21 | 100·35 | 100·39 | |
| Spec. grav. | 3·44 | 2·78 | — | — | — | — | 2·665 | — | 2·423 | — | — | 2·585 | — | 3·498 | 3·61 | — | 2·65 | 2·61 | 2·607 | |

I. Uniaxial Augite. II. Labradorite. III.–VI. Pectolite. VII. Xonotlite. VIII, IX. Tobermorite.[1] X.–XII. Scolecite. XIII. Pink Epidote. XIV. Garnet. XV. Basal Mudstone (altered). XVI. Uncontaminated argillaceous xenolith. XVII. Contaminated argillaceous xenolith. XVIII. Dark-green Spine.

[1] In British Museum Students' Index Tobermorite is listed as a synonym of Cyrolite.

*(Table 9) Analyses other than bulk anayses of igneous rocks, made from material collected collected in the Mull District.*

TABLE X.—Synopsis of Mull Basalts Microscopically examined from 1-inch Map, Sheet 44.

| District. | Ornament employed in Pl. III. | Number of Slides Examined. | | Number of Slides with— | |
|---|---|---|---|---|---|
| | | *Plateau Types.* | *Central Types.* | *Olivine fresh.* | *Olivine all decomposed.* |
| Area 1 . . . | Plateau | 16 | 1 | 15 | 2 |
| ,, 2 . . . | Plateau | 8 | 1 | 4 | 5 |
| ,, 3 . . . | Plateau | 6 | Nil. | 5 | 1 |
| ,, 4 . . . | Plateau | 8 | Nil. | 8 | Nil. |
| ,, 4a . . . | Plateau | 4 | Nil. | 2 | 2 |
| ,, 5 . . . | Central | Nil. | 1 | Nil. | Nil. |
| | Plateau | 60 | 1 | Nil. | 60 |
| ,, 6 . . . | Central | 2 | 36 | Nil. | 3 |
| | Plateau | 38 | 6 | Nil. | 42 |
| ,, 7 . . . | Central | 2 | 21 | Nil. | 5 |
| | Plateau | 17 | 1 | Nil. | 18 |
| ,, 8 . . . | Central | 1 | 5 | Nil. | 1 |
| | Plateau | 107 | 5 | Nil. | 112 |
| ,, 9 . . . | Central | Nil. | 2 | Nil. | Nil. |
| | Plateau | 52 | 8 | Nil. | 62 |
| ,, 10 . . . | Central | Nil. | 74 | Nil. | 33 |
| Sheet 44 (*inclusive*). | Central | 5 | 139 | ... | ... |
| | Plateau | 316 | 23 | ... | ... |

*(Table 10) Synopsis of Mull basalts microscopically examined from 1-inch map, Sheet 44*

TABLE XI.—Water of Augite-Andesites.

| | Ia | Ib | IIa | IIb | IIIa | IIIb | IV. | V. | |
|---|---|---|---|---|---|---|---|---|---|
| $SiO_2$ . . | 61·69 | 59·21 | | | | | 62·37 | 64·13 | $SiO_2$ |
| $H_2O+105°$ . | 2·36 | 1·54 | 2·38 | 1·56 | 2·44 | 0·93 | 5·54 | 2·71 | $H_2O+105°$ |
| $H_2O$ at 105° | 0·25 | 2·05 | 0·45 | 1·34 | 0·38 | 1·64 | 0·44 | 0·36 | $H_2O$at 105° |
| Cl . . | 0·02 | nt. fd. | | | | | | | Cl |
| Spec. grav. . | 2·64 | 2·61 | 2·82 | 2·77 | 2·89 | 2·71 | 2·50 | 2·57 | |

*(Table 11) Water of augite-andesites*