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Fourth supplementary list of British minerals

PETER G. EMBREY

Department of Mineralogy, British Museum (Natural History)

AN invitation by Mr. Richard Lambert to write a foreword for a facsimile edition of 'Greg and Lettsom' (Lapidary Publications, 1977) has allowed me to persuade him to append L. J. Spencer's three supplementary lists of British minerals, and has provided the occasion for a fourth list to bring the work reasonably up to date. This fourth list is now reprinted by his kind permission.

I had expected the new list, a mere 19 years after the previous one, to be relatively short, and have been amazed to find it running to some 131 entries, most of them valid species (112). Some of the records are provisional, in the sense that identification was uncertain. I have included a few interesting varieties, and—following Spencer—a few new records (marked with a double asterisk **) based on specimens in the national mineral collection at the British Museum (Natural History) or on private communications. Some records consist solely of a mere mention in a paper, or of an exhibit at a meeting of the Mineralogical Society, for which I have added details of locality or description in those cases where I have seen the specimens. In the main these additions relate to specimens found by the late Arthur Kingsbury (1906–68). County references are to the old boundaries, throughout.

Spencer¹ considered that his three lists added about 250 species to the 241 given by Greg and Lettsom, so that with the present list the total is now about 600. I have not checked these figures, which need revision in the light of investigations that have affected the status of some species by downgrading them to varieties or (as with tourmaline) making them group names covering several species. Spencer also estimated the number of known species to be about 1300; a current estimate

would be about twice this number,² so there are perhaps 2000 species awaiting record from the British Islands.

I thank R. K. Harrison, E. A. Jobbins, and B. R. Young, Institute of Geological Sciences, and my colleagues at the BM(NH) for bringing additional information to my notice.

Aerugite $\text{Ni}_9\text{As}_3\text{O}_{16}$ Monoclinic
Green massive, with yellow xanthosite, quartz, and arsenides near the south shaft at South Terras mine, St. Stephen-in-Brannell, Cornwall. R. J. Davis, M. H. Hey, and A. W. G. Kingsbury (1965), *Mineral. Mag.* 35, 72.

Agardite Hexagonal
 $(\text{Ln}, \text{CaH})\text{Cu}_6(\text{AsO}_4)_3(\text{OH})_6 \cdot 3\text{H}_2\text{O}$
Pale-green fibres, resembling aurichalcite and giving the powder-pattern of mixite (q.v.), on mimetite in quartz on old specimens in the BM(NH), at Wheal Alfred, Phillack, Cornwall. The variety agardite-(Nd), according to F. Permingeat, *priv. comm.*

Akermanite $\text{Ca}_2(\text{MgSi}, \text{Al}_2)\text{SiO}_7$ Tetragonal
Small colourless or faintly brown crystals in thermally altered limestone at Kilchoan, Ardnarmurchan, Argyllshire, Scotland. S. O. Agrell (1965), *Mineral. Mag.* 34, 2.

Algodonite near Cu_6As Orthorhombic
R. K. Harrison (1973). See under maucherite.

¹ L. J. Spencer (1958), *Mineral. Mag.* 31, 787.

² Consider, for example, the entries in M. Fleischer's 'Glossary of Mineral Species' (1975).

Alunite $KAl_3(SO_4)_2(OH)_6$ Rhombohedral

Small colourless rhombs and white massive from a vein in a dolerite sill at Embleton quarry, near Cockermouth, Cumberland. A. W. G. Kingsbury (1955), *Mineral. Mag.* **32**, 418.

****Amalgam** Hg-Ag alloy Cubic

Thin dull brassy sheets on grey baryte, with tennantite in limestone, at Gortdrum mine, Oola, Co. Tipperary, Ireland. BM(NH) specimens, collected by A. J. Criddle and G. S. Bearne, 1974.

Amblygonite (Li, Na)AlPO₄(F, OH) Triclinic

See under montebasite. Also, in leucogranite near the roof of the Tregonning granite, Rinsey, Cornwall. C. S. Exley and M. Stone (1964), in 'Present views of some aspects of the geology of Cornwall and Devon' (*Roy. geol. Soc. Cornwall*), pp. 144-5.

Anglesite (var. radian anglesite)

Small (< 0.1 mm) white crystals of anglesite in uraniferous hydrocarbon at Wheal Speed, Cornwall, contain co-precipitated radium. Other localities for radium concentrations are given. R. K. Harrison and K. Taylor (1966), *Bull. geol. Surv. Gt. Britain*, **25**, 41.

****Ardennite** Orthorhombic
Complex arsenate-vanadate-silicate of Mn, Al, etc.

Orange-brown cleavages on vein quartz, at Merehead quarry, near Shepton Mallet, Somerset. Specimen found by C. Parkinson (1977) and given to BM(NH).

Argentojarosite Rhombohedral
 $AgFe_3(SO_4)(OH)_6$

Yellow, micaceous, and ochreous, at West Turf Pits mine, Grassington Moor, Yorkshire. Also, at Treore mine, St. Teath, Cornwall. A. W. G. Kingsbury (1964), *Mineral. Mag.* **35**, li; idem (1964), in 'Present views of some aspects of the geology of Cornwall and Devon' (*Roy. geol. Soc. Cornwall*), p. 249.

Arthurite Monoclinic
near $CuFe_2(AsO_4)_2(O, OH)_2 \cdot 4H_2O$

Thin apple-green crusts, alone or with pharmacosiderite or a hidalgoite-like mineral or both, on quartzose matrix at Hingston Down Consols, Calstock, Cornwall. A new species. R. J. Davis and M. H. Hey (1964), *Mineral. Mag.* **33**, 937.

Bannisterite Monoclinic
dimorph of Ganophyllite

Some of the ganophyllite at Benallt mine, Rhiw, Caernarvonshire (W. Campbell Smith *et al.*, 1948)

is the dimorph bannisterite. M. L. Smith and C. Frondel (1948), *Mineral. Mag.* **36**, 893.

Bazirite $BaZrSi_3O_9$ Hexagonal

Colourless interstitial accessory mineral in the aegirine-granite of Rockall, North Atlantic. A new species. J. R. Hawkes, R. J. Merriman, R. R. Harding, and D. P. F. Darbyshire (1975), *Rep. Inst. Geol. Sci.*, no. 75/1, 11-51; *Rep. Inst. Geol. Sci.* (1973), 123. B. R. Young, J. R. Hawkes, R. J. Merriman, and M. T. Styles (1978), *Mineral. Mag.* **42**, 35 40. [See also under 'Rinkite-group mineral'.]

Beryllonite $NaBePO_4$ Monoclinic

Colourless isolated crystals (2 cm) from a pegmatite vein in the old aplite quarry at Meldon, Okehampton, Devon. A. W. G. Kingsbury (1964), *Mineral. Mag.* **35**, lviii.

Betafite (?) Metamict

'A pyrochlore mineral, probably betafite' in the Chiapaval granite pegmatite, South Harris, Outer Hebrides. O. von Knorring and R. Dearnley (1960), *Mineral. Mag.* **32**, 370, 373.

Bicchulite $Ca_2Al_2SiO_7 \cdot H_2O$ Cubic

Colourless crust, an alteration product of gehlenite, on wollastonite with hydrogrossular and garnet, in thermally altered chalk at Carneal, Co. Antrim, Ireland. A new species. C. Henmi, I. Kusachi, K. Henmi, P. A. Sabine, and B. R. Young (1973), *Mineral. Journ. (Sapporo)*, **7**, 243-51.

Birnessite (Na, Ca)Mn₇O₁₄·3H₂O

Minute black crystals in grains (< 8 mm) of manganese oxide 'pan' in a road cutting at Birness, 20 miles north of Aberdeen, Scotland. A new species. L. H. P. Jones and A. A. Milne (1956), *Mineral. Mag.* **31**, 283.

Bismutoferrite $BiFe_2(SiO_4)_2OH$ Monoclinic

Greenish-yellow massive, in quartz and bismuth at South Terras mine, St. Stephen-in-Brannell, Cornwall. A. W. G. Kingsbury (1963), *Mineral. Mag.* **33**, xc.

Blixite (?) $PbCl_2(O, OH)_{1-x}$ Orthorhombic

Yellow, cleavable masses in hydrocerussite, etc., at Merehead quarry, Somerset. C. J. Alabaster (1975), *Proc. Bristol Nat. Soc.* **34**, 89, 92.

Also, with brucite, same locality, idem (1977), *Mineral. Mag.* **41**, 406. [Presumably the same as the 'un-named lead oxychloride' (q.v.), which has a different X-ray powder pattern from that of type blixite; the author was informed of this difference before publication—P. G. E.]

- Calomel** Hg_2Cl_2 Tetragonal
Grey crystals with native mercury and malachite in oxidized ore at Chatsworth mine, Grassington Moor, Yorkshire. A. W. G. Kingsbury (1968), *Mineral. Mag.* 37, xlii.
- **Chernovite (?)** YAsO_4 Tetragonal
May be a constituent of black globules (< 5 mm) on massive pink gypsum at Gipsy Lane, Leicester. Specimens collected by N. Hubbard (1976) and given to BM(NH). [Gives an X-ray powder pattern near chernovite; spectrographic confirmation of Y, As, with Cu, U, Si, Al, etc.; sulphide also present.]
- Chrysoberyl** BeAl_2O_4 Orthorhombic
Green crystal plates (< 2 cm) with feldspar from a pegmatite in the old aplite quarry at Meldon, Okehampton, Devon. A. W. G. Kingsbury (1964), *Mineral. Mag.* 35, lvii. [The earlier record by S. Haughton (1856), from the Mourne Mountains, Ireland, lacked confirmatory detail.]
- Cinnabar** HgS Rhombohedral
Small, red, earthy patches with smithsonite on fluorite, at Rutland Cavern, Matlock Bath, Derbyshire. Also at Masson Hill, Matlock. R. S. W. Braithwaite, T. B. Greenland, and G. Ryback (1963), *Nature*, 200, 1004; *Mineral. Mag.* 33, lxxxvi. A. W. G. Kingsbury (1963), *ibid.* 33, xc.
From Yorkshire, various localities, including minute crystals at Turf Pits and Moss mines, Grassington Moor, and tetrahedral pseudomorphs after metacinnabarite (q.v.) at Peat's Pasture, near Pateley Bridge. A. W. G. Kingsbury (1968), *Mineral. Mag.* 37, xlii.
From Ireland, crystalline on muddy limestone with calcite, at Gortdrum mine, Oola, Co. Tipperary. BM(NH) specimens, collected by A. J. Criddle in 1970.
- Coffinite** $\text{U}(\text{SiO}_4)_{1-x}(\text{OH})_{4x}$ Tetragonal
Replacements of and pseudomorphs (< 5 mm) after colloform pitchblende at Roskrow United mine, Ponsanooth, Cornwall. K. Taylor and R. K. Harrison (1958), *Nature*, 181, 363; (1966), *Bull. geol. Surv. Gt. Britain*, 25, 33.
Also at Kingswood mine, near Buckfastleigh, Devon, and at Geevor, South Terras, and other mines in Cornwall. A. G. Darnley (1961), *Mineral. Mag.* 33, lxi; 34, 159.
Also, in the nodules of Budleigh Salterton, Devon. R. K. Harrison (1975), *Bull. geol. Surv. Gt. Britain*, 52, 15.
- Coronadite** $\text{PbMn}_8\text{O}_{16}$ Tetragonal
Silver-grey to black fibrous, botryoidal, with quartz, campylite, and other manganese oxides at Dry Gill mine, Caldbeck Fells, Cumberland. J. Hartley (1960), *Mineral. Mag.* 32, 343. [Is probably present in the manganese oxides of the Mendip Hills, and elsewhere.]
- Corundophilite** Chlorite group
Dark-green compact, filling amygdalae in basalt at An Gearna, Ben More, Isle of Mull; also green radiating with calcite, Mill Close mine, Darley Dale, Derbyshire. Specimens in BM(NH).
- **Cowlesite** Orthorhombic
 $(\text{Ca}, \text{Na})\text{Al}_2\text{Si}_3\text{O}_{10} \cdot 5-6\text{H}_2\text{O}$
A new (1975) zeolite mineral, now identified on specimens from Northern Ireland. R. W. Tschernich (1977), *priv. comm.* With levyne and erionite in weathered boulders on the shore at Dunseverick, and in fresh rock in the old quarry at Ballyclare, and elsewhere in Co. Antrim. H. Foy (1977), *priv. comm.*
- Crandallite** Rhombohedral
 $\text{CaAl}_3(\text{PO}_4)_2(\text{OH})_5 \cdot \text{H}_2\text{O}$
Microscopic colourless grains with apatite, kaolinite, etc. in the Rowhurst Tonstein at Red Street colliery, near Kidsgrove, Staffordshire. A. A. Wilson, G. A. Sergeant, B. R. Young, and R. K. Harrison (1966), *Proc. Yorks. geol. Soc.* 35, 421.
- Cryptomelane** $\text{KMn}_8\text{O}_{16}$ Monoclinic
See under lithiophorite.
- **Danburite** $\text{CaB}_2\text{Si}_2\text{O}_8$ Orthorhombic
A single colourless terminated crystal, found with milarite, beryl, and phenakite in a clay-filled vug at Cheesewring quarry, Linkinhorne, Cornwall, by A. W. G. Kingsbury (1951-2) and given to the BM(NH).
- Dellaite** $\text{Ca}_{12}\text{Si}_6\text{O}_{22}(\text{OH})_4$ Triclinic (?)
Small (< 2 mm) bladed crystals with calcite in spurrite assemblages in thermally altered limestone at Kilchoan, Ardnamurchan, Argyll, Scotland. A new species. S. O. Agrell (1965), *Mineral. Mag.* 34, 6.
- Digenite** $\text{Cu}_{1.8}\text{S}$ Cubic
Djurleite $\text{Cu}_{1.93}\text{S}$ Orthorhombic
These two species closely resemble chalcosine, and cannot readily be distinguished from it. Djurleite is closer in composition to chalcosine, and is probably commoner than digenite. Chalcosine (*sensu lato*) has several crystal habits, which on investigation may prove to be diagnostic; a survey, by X-ray and other methods, is needed. W. R. Cook, Jr. (1972), *Mineral. Record*, 3, 15, has found that

some old specimens of Cornish chalcocite are djurleite or digenite, and suggested that conversion has taken place, caused by removal of copper by oxidation. At the BM(NH) we have identified: digenite from Botallack mine, Cornwall, and from 'near Tavistock', Devon; djurleite from Wheal Owles and from Dean quarry, Cornwall, from Merehead and Cannington Park quarries, Somerset, and from Gipsy Lane, Leicester. A specimen of digenite from the Falls of Rogie, Ross and Cromarty, is in the Geological Museum, I.G.S. Also, see under Wittichenite. The newly described mineral anilite, orthorhombic Cu_7S_4 (*Amer. Mineral.* (1969), **54**, 1256), is readily converted to digenite even by gentle grinding and so will not be discovered by normal X-ray powder surveys.

****Durangite** $\text{NaAlAsO}_4\text{F}$ Monoclinic
Reddish-brown crystal fragments from an E.-W. joint face of the granite at Cheesewring quarry, Linkinhorne, Cornwall. Collected by A. W. G. Kingsbury (1958) and given to the BM(NH).

Elbaite Lithium tourmaline

The pink (var. rubellite) and green (var. verdelite) tourmalines of the Meldon aplite, Okehampton, Devon, have been analysed. M. N. Chaudhry and R. A. Howie (1976), *Mineral. Mag.* **40**, 747.

Elpidite Orthorhombic
 $\text{Na}_2\text{ZrSi}_6\text{O}_{15} \cdot 3\text{H}_2\text{O}$

Creamy-white and yellowish needles in cavities or interstitially in the aegirine-granite of Rockall, North Atlantic. P. A. Sabine (1960), *Bull. geol. Surv. Gt. Britain*, **16**, 167-8. [Confirms an earlier record by Lacroix (1921), not in Spencer's lists.]

Erionite Hexagonal
 $(\text{Ca}, \text{Na}, \text{K})_2\text{Al}_3\text{Si}_9\text{O}_{24} \cdot 9\text{H}_2\text{O}$

Fibrous coatings on leucite, in amygdalae in various rhyolitic and basaltic lavas in Co. Antrim, Ireland. [R. A. Old and B. R. Young], *Rep. Inst. geol. Sci.* (1973), p. 124. See also under Cowlesite.

Eskolaite Cr_2O_3 Rhombohedral

Very thin green coatings round quartz grains in greywacke pebbles in boulder clay at Callowhill Upper, near Newtown Mt. Kennedy, Co. Wicklow. M. J. Oppenheim *et al.* (1977), *Mineral. Mag.* **41**, 402.

'Euclolite-eudialyte mineral'

Incompletely characterized colourless mineral, almost isotropic, in a cavity of the aegirine-granite of Rockall, North Atlantic. P. A. Sabine (1960), *Bull. geol. Surv. Gt. Britain*, **16**, 168-9.

Eudidymite $\text{NaBeSi}_3\text{O}_7(\text{OH})$ Monoclinic

White pearly crystal plates and cleavages (< 3 cm) with feldspar from a pegmatite vein in the old aplite quarry at Meldon, Okehampton, Devon. A. W. G. Kingsbury (1964), *Mineral. Mag.* **35**, lvii.

Ferricopiapite Triclinic
 $\text{Fe}_5(\text{SO}_4)_6\text{O}(\text{OH}) \cdot 20\text{H}_2\text{O}$

Pale-yellow botryoidal with copper on fluorite at Grove Rake mine, Rookhope, Weardale, Co. Durham. F. W. Smith (1973), *Mineral. Mag.* **39**, 244.

Foshagite $\text{Ca}_4\text{Si}_3\text{O}_9(\text{OH})_2$ Triclinic

Colourless fibrous aggregates with merwinite, larnite, or kilchoanite at the margins of veins (0.1-2.0 mm wide) in thermally altered limestone at Kilchoan, Ardnamurchan, Argyll, Scotland. S. O. Agrell (1965), *Mineral. Mag.* **34**, 8.

****Francevillite** Orthorhombic
 $\text{Ba}(\text{UO}_2)_2(\text{VO}_4)_2 \cdot 5\text{H}_2\text{O}$

Yellow earthy crust on pitchblende nodule, at South Terras mine, St. Stephen-in-Brannell, Cornwall. BM(NH) specimen, from V. P. Aspland (1936).

Freirinite (syn. of lavendulan)

R. K. Harrison (1975). See under maucherite.

Gahnite ZnAl_2O_4 Cubic

Crystals and massive in the Chiapaval granite pegmatite, South Harris, Outer Hebrides. O. von Knorring (1960), *Mineral. Mag.* **32**, 374.

Garronite Orthorhombic
 $\text{Na}_2\text{Ca}_5\text{Al}_{12}\text{Si}_{20}\text{O}_{64} \cdot 27\text{H}_2\text{O}$

Colourless radiating zeolite filling amygdalae (< 2 cm) in olivine basalt in screes on the western slopes of the Glenariff valley, and at five other localities in Co. Antrim, Ireland. New species. G. P. L. Walker (1960), *Mineral. Mag.* **32**, 505; **33**, 173.

Genthelvite Cubic
 $(\text{Zn}, \text{Fe}, \text{Mn})_4\text{Be}_3(\text{SiO}_4)_3\text{S}$

Pink blebs with garnet and chlorite at Treburland, Altarnun, Cornwall. A. W. G. Kingsbury (1961), *Mineral. Mag.* **32**, 929.

Green and brown zoned tetrahedra (< 13 mm) with bertrandite crystals in cavities in adamellite at Coire an Lochain, Cairngorm Mountains, Scotland. W. C. Morgan (1967), *ibid.* **36**, 60; A. M. Clark and E. E. Fejer (1976), *ibid.* **40**, 637.

Gismondine $\text{CaAl}_2\text{Si}_2\text{O}_8 \cdot 4\text{H}_2\text{O}$ Monoclinic

Chalky white, radiating, with chabazite in amygdalae in basalt at Bruslee quarry, Ballyclare, and at other localities in Co. Antrim, Ireland. G. P. L. Walker (1962), *Mineral. Mag.* **33**, 187.

An earlier record (Bryce, 1833) is discounted as a mixture of chabazite and heulandite. *Ibid.* **32**, 207.

Glauberite $\text{Na}_2\text{Ca}(\text{SO}_4)_2$ Monoclinic

Replacing anhydrite and polyhalite in evaporites at Forden, near Scarborough, Yorkshire. F. H. Stewart (1965), *Mineral. Mag.* **34**, 465.

****Greenovite** (var. of sphene)

Pink subhedral crystals in quartz at the British Rail quarry, Meldon, Okehampton, Devon. Found by A. W. G. Kingsbury (1958) and given to the BM(NH).

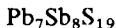
Gudmundite FeSbS Monoclinic

In marcasite pseudomorphs, and intergrown with tetrahedrite, at the Shallee and Gortnadyne mines, Silvermines, Co. Tipperary, Ireland. H. N. Rhoden (1959), *Mineral. Mag.* **32**, 133.

Helvine $(\text{Mn, Fe, Zn})_4\text{Be}_3(\text{SiO}_4)_3\text{S}$ Cubic

Yellow tetrahedra (< 2 mm) and massive in calcflinta at Bodmin Wheal Mary (Wheal Ding section), Lanivet, Cornwall. Also, as small grains, at Wheal Betsy, Tremore, Lanivet; and at Red-a-Ven Brook mine, Meldon, Okehampton, Devon. A. W. G. Kingsbury (1961), *Mineral. Mag.* **32**, 924.

Heteromorphite (?) Monoclinic



Two specimens from Port Isaac, Cornwall, were recorded by W. Nevill (1872) in the printed catalogue of his collection (p. 20). Doubtless omitted by Spencer from his lists because of presumed synonymy with semseyite. Confirmation is required.

Hidalgoite (?) Rhombohedral



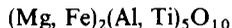
Incompletely characterized mineral close to hidalgoite, associated with arthurite and pharacosiderite, at Hingston Down Consols, Calstock, Cornwall. R. J. Davis and M. H. Hey (1964), *Mineral. Mag.* **33**, 937. See also E. B. Försch, *ibid.* **36**, 530.

Hinsdalite (?) Rhombohedral



A specimen of bluish-grey plumbogummite from Roughton Gill, Cumberland, appeared to be a mixture of hinsdalite, plumbogummite, and hidalgoite. E. B. Försch (1967), *Mineral. Mag.* **36**, 530.

Högbomite *H* and *R* polytypes



Brown grains with green spinel intergrown with magnetite in corundum in a complex xenolith in gabbro at Cashal, near Toombeola, Co. Galway, Ireland. D. McKie (1963), *Mineral. Mag.* **33**, 563.

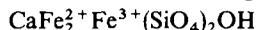
Hydroscarbroite $\text{Al}_2(\text{CO}_3)_2 \cdot 12\text{Al}(\text{OH})_3 \cdot n\text{H}_2\text{O}$

With scarbroite as a fine-grained white compact mixture in fissures in sandstone at South Bay, Scarborough, Yorkshire. W. J. Duffin and J. Goodyear (1960), *Mineral. Mag.* **32**, 353.

Ilsemannite (?) $\text{Mo}_3\text{O}_8 \cdot n\text{H}_2\text{O}$ (?)

A blue post-mining efflorescence on limestone and anhydrite in the mine under the I.C.I. factory site at Billingham-on-Tees, Co. Durham. L. R. Raymond (1959), *Mineral. Mag.* **32**, 172.

****Ilvaite** Orthorhombic



Black, coarsely radiating, and granular massive, at Wheal Messer, Lanivet, Cornwall; in Devon at Ramsley mine, Okehampton, and at Smallacombe iron mine, Ilington. Collected at different times by A. W. G. Kingsbury and given to the BM(NH).

Iron-boracite Orthorhombic



Blue-green 'cubo-octahedral' crystals (< 3 mm) and brown-purple grains, usually with sylvine, etc., in nodules in anhydrite shale at the Boulby mine, Loftus, Saltburn, Cleveland, Co. Durham. J. K. Milne, M. J. Saunders, and P. J. E. Woods (1977), *Mineral. Mag.* **41**, 404.

Julgoldite Monoclinic



Black grains or plumose crystal groups, with pectolite, in dolerite quarries at Ratho, near Edinburgh, and at Auchinstarry, Kilsyth, Scotland. A. Livingstone (1976), *Mineral. Mag.* **40**, 761. [Mistaken by M. F. Heddle for aenigmatite, and for goethite.]

'Kasolite-like mineral'

Predominantly a thorium-lead silicate, but with an X-ray powder pattern similar to that of kasolite, forming an olive-green rim surrounding uraninite, in the Chiapaval granite pegmatite, South Harris, Outer Hebrides. O. von Knorring and R. Dearnley (1960), *Mineral. Mag.* **32**, 376.

Kilchoanite $\text{Ca}_3\text{Si}_2\text{O}_7$ Orthorhombic

Small (< 2 mm) interlocking crystals with rankinite, in thermally altered limestone at Kilchoan, Ardnamurchan, Argyll, Scotland. A new species. S. O. Agrell and P. Gay (1961), *Nature*, **189**, 743; *Mineral. Mag.* **34**, 5.

Killalaite $2\text{Ca}_3\text{Si}_2\text{O}_7 \cdot \text{H}_2\text{O}$ Monoclinic

Colourless crystals (< 2 mm) in veins and cavities with calcite or awillite in thermally altered

limestone at Killala Bay, near Inishcrone, Co. Sligo, Ireland. A new species. R. Nawaz (1974), *Mineral. Mag.* **39**, 544.

Lavendulan (of Goldsmith) Orthorhombic
 $\text{NaCaCu}_5(\text{AsO}_4)_4\text{Cl}\cdot 5\text{H}_2\text{O}$

R. K. Harrison (1975). See under maucherite.

Leucophosphite Monoclinic
 $\text{KFe}_2^+(\text{PO}_4)_2\text{OH}\cdot 2\text{H}_2\text{O}$

Waxy, orange-coloured interstitial colloform grains and minute (< 0.003 mm) radiating fibres replacing pyroxene, feldspar, and elpidite, in the aegirine-granite of Rockall, North Atlantic. J. R. Hawkes, R. J. Merriman, R. R. Harding, and D. P. F. Darbyshire (1975), *Rep. Inst. geol. Sci.* 75/1, p. 25.

Lithiophorite (Al, Li) $\text{MnO}_2(\text{OH})_2$ Monoclinic

Black fine-grained massive, sometimes botryoidal, admixed with cryptomelane at the Lecht mines, Tomintoul, Banffshire, Scotland. M. J. Wilson, M. L. Berrow, and W. J. McHardy (1970), *Mineral. Mag.* **37**, 618.

Mackinawite (Fe, Ni, Co) $_9\text{S}_8$ Tetragonal

Minute flakes in magnetite-chlorite patches in serpentinized peridotite at The Rill, Kynance Cliff, Lizard, Cornwall. A. H. Clark (1967), *Mineral. Mag.* **36**, 614.

Maghemite (?) $\gamma\text{-Fe}_2\text{O}_3$ Cubic

Traces, with hematite in a laterite baked by a basalt dyke, at Lyles Hill mine, near Templepatrick, Co. Antrim, Ireland. V. A. Eyles (1952), *Mem. geol. Surv. Northern Ireland* [Antrim laterites and baunites], pp. 34, 41.

Malayaite CaSnSiO_5 Monoclinic

Yellow-brown irregular aggregates (< 4 mm), with löllingite and datolite, in fibrous wollastonite hornfels at Red-a-Ven Brook mine, Meldon, Okehampton, Devon. Previously called 'tin sphene' (q.v.). M. A. H. El Sharkawi and W. R. Dearman (1966), *Econ. Geol.* **61**, 366.

Maucherite (Ni, Co, Fe) $_{11}\text{As}_8$ Tetragonal

Permian nodular concretions at the Littleham Cove area, Budleigh Salterton, Devon, contain native copper plates (< 16 cm) and annular nickel arsenides (< 10 mm). Associated species are nickeline, rammelsbergite, maucherite, silver, modderite (?), copper sulphides, malachite, and lavendulan. R. K. Harrison (1973), *Rep. Inst. geol. Sci.* (1973), 123-4; (1975), *Bull. geol. Surv. Gt. Britain*, **52**, 1-26.

Meneghinite $\text{CuPb}_{13}\text{Sb}_7\text{S}_{24}$ Orthorhombic

Small needles with siderite in quartz at Shallowford Bridge, near South Molton, Devon; also massive, compact, at Pengenna mine, St. Kew, Cornwall. A. W. G. Kingsbury (1965), *Mineral. Mag.* **35**, 425.

Mercury Hg [Liquid]

Minute globules, with calomel and malachite in cavities of oxidized ore at Chatsworth mine, Grassington Moor, Yorkshire. A. W. G. Kingsbury (1968), *Mineral. Mag.* **37**, xlii.

Metacinnabarite HgS Cubic

Small black tetrahedra with cinnabar on calcite, at Turf Pits mine, Grassington Moor, Yorkshire; massive, with cinnabar in baryte-fluorite-calcite matrix at Cockhill mine, Beverley, Pateley Bridge, Yorkshire. A. W. G. Kingsbury (1968), *Mineral. Mag.* **37**, xlii.

Metatyuyamunite (?) Orthorhombic
 $\text{Ca}(\text{UO}_2)_2(\text{VO}_4)_2\cdot 3\text{-5H}_2\text{O}$

Yellow alteration product of a vanadiferous nodule of Permian age, at Budleigh Salterton, Devon. [May possibly have been pascoite, misidentified.] J. F. Wyley (1961), *Mineral. Mag.* **33**, xlvi.

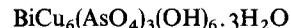
Milarite Hexagonal



Small colourless prisms on a joint in the aplite at Meldon, Okehampton, Devon. A. W. G. Kingsbury (1964), *Mineral. Mag.* **35**, lvii.

Larger prisms (< 8 mm) in vugs in a tourmaline vein at the Cheesewring quarry, Linkinhorne, Cornwall. Found by A. W. G. Kingsbury (1951-2) and given to BM(NH).

Mixite (?) Hexagonal



Small radiating groups of pale-green fibres, with malachite on gossan matrix, found at Wheal Owles, St. Just, Cornwall, by A. W. G. Kingsbury and given to BM(NH). Some of it may be agardite (q.v.).

Modderite (?) (Co, Ni, Fe)As

A cobalt arsenide of uncertain identity. R. K. Harrison (1974). See under maucherite.

Montebrasite Triclinic



Greyish-white cleavage masses (2-4 cm) of both montebrasite and amblygonite, the latter rarer and darker in colour, in a pegmatite vein in the old aplite quarry at Meldon, Okehampton, Devon.

A. W. G. Kingsbury (1964), in 'Present views on some aspects of the geology of Cornwall and Devon' (*Roy. geol. Soc. Cornwall*), p. 249; see also *Mineral. Mag.* (1969), **37**, 414.

Neotocite (Mn, Fe)SiO₃.H₂O

Collins's specimens of penwithite have been re-examined and found to be more properly referred to neotocite. A. M. Clark and J. Easton (1978), *Mineral. Mag.* **42**, M26.

Northupite (?) Na₃Mg(CO₃)₂Cl Cubic

A doubtful occurrence in the Lower Anhydrite of the Yorkshire potash field. F. H. Stewart (1965), *Mineral. Mag.* **34**, 462.

****Osarizawaite** Rhombohedral
PbCuAl₂(SO₄)₂(OH)₆

Yellowish-green crust and impregnation on sandstone at Alderley Edge, Cheshire. Specimen found by R. Taylor (1970) and given to BM(NH).

Osumilite Hexagonal
KMg₂Al₃(Al₂Si₁₀)O₃₀

Small (0.1 mm) crystals in glass on contact zone round dolerite plug at Tieveragh, Co. Antrim, Ireland. First record of K, Mg end-member. G. A. Chinner and P. D. Dixon (1973), *Mineral. Mag.* **39**, 189.

Pascoite (?) Ca₃V₁₀O₂₈.17H₂O Monoclinic
Perhaps the mineral identified as metatyuyamunite (q.v.).

Plumbojarosite Rhombohedral
PbFe₆³⁺(SO₄)₄(OH)₁₂

Alteration product of beudantite at Driggith mine and at Balliway Rigg, Caldbeck Falls, Cumberland; also at Treore mine and at Wheal Carpenter, Cornwall. A. W. G. Kingsbury and J. Hartley (1960), *Mineral. Mag.* **32**, 423.

Also at Turf Pits mine, Grassington Moor, Yorkshire. A. W. G. Kingsbury (1964), *ibid.* **35**, li.

Posnjakite Cu₄SO₄(OH)₆.H₂O Monoclinic

Blue crystalline crusts, with brochantite and langite, as a post-mining formation at Drakewalls mine, Gunnislake, Cornwall. Also, with langite, on old specimens from Fowey Consols, St. Blazey, Cornwall. See also under wroewolfeite. J. R. Knight and R. W. Barstow (1970), *Mineral. Mag.* **37**, 740.

****Priceite** Ca₄B₁₀O₁₉.7H₂O Triclinic (?)

White porcellanous massive, from a pegmatite in the old aplite quarry at Meldon, Okehampton, Devon. Collected by A. W. G. Kingsbury (1959) and given to the BM(NH).

Pyroaurite (nickeloan var.) Rhombohedral
Mg₄Ni₂Fe₃²⁺(OH)₁₃CO₃.4H₂O

Grass-green disseminations and coatings in serpentinite in a roadside quarry 1 km west of Leslie, Aberdeenshire, Scotland. M. J. Wilson *et al.* (1976), *Mineral. Mag.* **40**, 447.

Pyrobelonite MnPbVO₄(OH) Orthorhombic
Veinlets and individual grains (< 5 mm) with vanadinite in iron-manganese ore at Ty Coch, near South Cornelly, Mid Glamorgan, Wales. A. J. Criddle and R. F. Symes (1977), *Mineral. Mag.* **41**, 85.

Pyrosmalite Trigonal
(Fe, Mn)₈Si₆O₁₅(OH, Cl)₁₀

Small crystals (< 0.5 mm) in contact-altered slate at Nant Francon, North Wales. P. E. Brown (1959), *Mineral. Mag.* **32**, 242.

Also, coarsely crystalline aggregate, at Treburland mine, Altarnun, Cornwall. *Ibid.* (footnote), **32**, 244.

Reyerite Trigonal
Hydrous aluminosilicate of Ca, Na, K

With gyrolite in basalt at 'S Airde Beinn, Northern Mull, Scotland. J. R. Cann (1965), *Mineral. Mag.* **35**, 1.

A Scottish specimen, otherwise unlocalized, is referred to by R. A. Chalmers *et al.* (1964), *ibid.* **33**, 839.

Rhodizite Cubic
CsAl₄Be₄B₁₁O₂₅(OH)₄

Small colourless crystals on rubellite from the new aplite quarry at Meldon, Okehampton, Devon. A. W. G. Kingsbury (1964), *Mineral. Mag.* **35**, lvii.

'Rinkite-group mineral'

Incompletely characterized mineral in the aegirine-granite of Rockall, North Atlantic. Is now called bazirite (q.v.). P. A. Sabine (1960), *Bull. geol. Surv. Gt. Britain*, **16**, 168.

Romanèchite Orthorhombic
BaMn²⁺Mn₈O₁₆(OH)₄

Species name approved by the I.M.A. to replace psilomelane, which is now a general term for hard manganese oxides.

Roscoelite (?) (vanadium mica)

Vanadium in the Permian nodular concretions at Budleigh Salterton, Devon, appears to be concentrated mainly in a mica mineral, probably roscoelite. R. K. Harrison (1975), *Bull. geol. Surv. Gt. Britain*, **52**, 11, 15.

- Rustumite** $\text{Ca}_3\text{Si}_2\text{O}_7(\text{OH})_2$ Monoclinic
 Small colourless crystals (< 2 mm) in a zone between spurrite and kilchoanite assemblages in thermally altered limestone at Kilchoan, Ardnamurchan, Argyll, Scotland. A new species. S. O. Agrell (1965), *Mineral. Mag.* **34**, 2.
- Schorlomite** $\text{Ca}_3(\text{Fe, Ti})_2(\text{Si, Ti})_3\text{O}_{12}$ Cubic
 With ferroan wollastonite and titanaugite in a pegmatite at Camphouse, Ardnamurchan, Argyll, Scotland. R. A. Howie and A. R. Woolley (1968), *Mineral. Mag.* **36**, 779.
- Sideronatrite** $\text{Na}_2\text{Fe}(\text{SO}_4)_2\text{OH} \cdot 3\text{H}_2\text{O}$ Orthorhombic
 Small (< 1 mm) yellow to orange crystals encrusting marcasite and pyrite in a cavity 1220 ft below sea level in the Brockwell coal seam, Rising Sun colliery, Backworth, Northumberland. B. A. O. Randall and J. M. Jones (1966), *Mineral. Mag.* **35**, 983.
- Silicomazonite (?)**
 See under 'un-named rare-earth mineral'.
- **Spencerite** $\text{Zn}_4(\text{PO}_4)_2(\text{OH})_2 \cdot 3\text{H}_2\text{O}$ Monoclinic
 Aggregates of iron-stained pearly bladed crystals at Turf Pits mine, Grassington Moor, Yorkshire. The second known occurrence. Collected by A. W. G. Kingsbury (1963) and given to the BM(NH).
- Stevensite** $\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$ Monoclinic
 Fibrous and compact, as an alteration product of pectolite, with pyrite, calcite, and dolomite in amygdaloids of the Whin Sill dolerite at Barrasford quarry, near Gunnerton, Northumberland. B. A. O. Randall (1959), *Mineral. Mag.* **32**, 218.
- Strontianite** (var. strontioalcite, or emmonite)
 Spherulitic, in veins in celestine-bearing limestone at Durlston Head, Swanage, Dorset. D. L. Salter and I. M. West (1965), *Mineral. Mag.* **35**, 146.
- Sulphoborite** $\text{Mg}_3\text{B}_2\text{SO}_4(\text{OH})_{10}$ Orthorhombic
 Replacing anhydrite in the Lower Evaporites at Forden, near Scarborough, Yorkshire. F. H. Stewart (1963), *Proc. Yorks. geol. Soc.* **34**, 1; *Mineral. Mag.* **34**, 467.
- Svanbergite** $\text{SrAl}_3\text{PO}_4\text{SO}_4(\text{OH})_6$ Rhombohedral
 In andalusite schist at Wheal Coates, St. Agnes, Cornwall. A. W. G. Kingsbury (1964), in 'Present views of some aspects of the geology of Cornwall and Devon' (*Roy. geol. Soc. Cornwall*), p. 249.
- Tacharanite** $\text{Ca}_{12}\text{Al}_2\text{Si}_{18}\text{O}_{69}\text{H}_{36}$ Monoclinic
 White compact, altering to tobermorite and gyrolite, in vesicles of an olivine-dolerite near Portree, Isle of Skye. A new species. J. M. Sweet (1961), *Mineral. Mag.* **32**, 745.
 Other localities in Scotland and Ireland; G. Cliff *et al.* (1975), *ibid.* **40**, 113.
- Tangeite** CuCaVO_4OH Orthorhombic
 Greenish-yellow crust on gypsum, near vanadiferous nodules in Keuper Marl, in a brick pit at Glen Parva, Leicestershire. R. J. King and J. A. Dixon (1971), *Mineral. Mag.* **38**, 488.
- Tellurbismuth** Bi_2Te_3 Rhombohedral
 At Clogau (= St. David's) and Vigra mines, near Dolgelly, North Wales. Formerly recorded as tetradymite, which has not yet been verified from Britain. A. W. G. Kingsbury (1965), *Mineral. Mag.* **35**, 424.
- Thaumasite** $\text{Ca}_3\text{SiCO}_3\text{SO}_4(\text{OH})_6 \cdot 12\text{H}_2\text{O}$ Hexagonal
 Soft white patches (< 3 mm) on a fracture surface in dolerite 263 ft below ground level, from a borehole near Flush Hall, Ballyalton, Newtownards, Co. Down, Ireland. D. C. Knill (1960), *Mineral. Mag.* **32**, 416.
 Also, with gypsum in a quartz-carbonate vein in dolerite at Embleton quarry, near Cockermouth, Cumberland. *Ibid.* **32**, 418 (footnote).
- 'Tin-sphene'
 Now called malayaite (q.v.). W. R. Dearman and M. A. H. El Sharkawi (1965), *Proc. Ussher Soc.* **1**, 165.
- **Triplodite** $(\text{Mn, Fe})_2\text{PO}_4\text{OH}$ Monoclinic
 Small (< 1 mm) yellow globules on neotocite (J. H. Collins's specimen of penwithite) at Wheal Owles, St. Just-in-Penwith, Cornwall. A. M. Clark (1977), *priv. comm.*
- **Tsumebite** $\text{Pb}_2\text{Cu}(\text{PO}_4, \text{AsO}_4)\text{SO}_4\text{OH}$ Monoclinic
 Intermediate member of tsumebite-arsentsumebite series, as yellowish-green granular crust on quartz from Carrock Fell, Cumberland. Specimen found by C. Moffitt (1976) and given to BM(NH).
- Unidentified uranium mineral(s)
 A greenish-yellow encrustation on joint faces in the granite quarry at Merrivale, Dartmoor, Devon,

is a mixture of uranium minerals as yet (1977) uncharacterized. Specimens have been found by many collectors.

Un-named lead oxychloride

Granular reddish-orange to pale-yellow mineral, similar to blixite but with a different X-ray powder pattern, with hydrocerussite, cerussite, and mendipite at Merehead quarry, near Shepton Mallet, Somerset. R. F. Symes and P. G. Embrey (1977), *Mineral. Record*, **8**, 301.

Un-named lead molybdenum oxychloride

Minute red grains in mendipite at Merehead quarry, near Shepton Mallet, Somerset. R. F. Symes and P. G. Embrey (1977), *Mineral. Record*, **8**, 300.

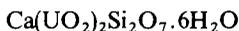
Un-named nickel hydroxides

Blue-green $[\text{Ni}(\text{OH})_2]$ and citron-yellow [perhaps $4\text{Ni}(\text{OH})_2 \cdot \text{NiOOH}$] encrustations on chromitite at Hagdale quarry, Unst, Shetlands. M. F. Heddle specimens, referred to by him (1901) as zaratite and chrome ochre. H. G. Macpherson and A. Livingstone (1974), *Mineral. Mag.* **39**, 718.

Un-named rare-earth mineral

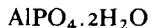
Canary-yellow earthy, with feldspar, apatite, and harmotome in cavities in nordmarkite at Lettermore quarry, Loch Loyal, Sutherland, Scotland. O. von Knorring and R. Dearnley (1960), *Mineral. Mag.* **33**, 389. (Composition near monazite, but with some silica replacing phosphate and some Mg, Ca, and Fe replacing rare earths [perhaps silicomazite, not described until 1972—P. G. E.])

Uranophane Monoclinic



Yellow powdery films on fracture surfaces of monazite from the Loch a'Sgurr granite pegmatite, South Harris, Outer Hebrides. O. von Knorring and R. Dearnley (1960), *Mineral. Mag.* **32**, 369.

Variscite Orthorhombic



Small glassy globules, often at the centre of radiating wavellite, on joints in Culm slate at High Down quarry, near Filleigh, Devon. Unwittingly figured in Sowerby's *British Minerals*, Vol. II, 63, pl. 134 (1805). A. W. G. Kingsbury (1964), in 'Present views of some aspects of the geology of Cornwall and Devon' (*Roy. geol. Soc. Cornwall*), p. 255.

Vaterite Hexagonal



A major constituent of a carbonated calcium silicate hydrogel complex formed from larnite, at Ballycraigy, Larne, Co. Antrim, Ireland. J. D. C. McConnell (1960), *Mineral. Mag.* **32**, 535.

p-Veatchite Monoclinic



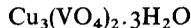
The veatchite described by Stewart *et al.* (1954), from the Eskdale No. 2 borehole in Yorkshire, has been re-identified as the polymorph, *p*-veatchite. C. A. Beevers and F. H. Stewart (1960), *Mineral. Mag.* **32**, 500.

Vesigniéite Monoclinic



Yellowish-green rosettes (< 2 mm) in bornite, in copper sulphide veins cutting dolerite and hornfels at Newhurst quarry, near Shepshed, Leicestershire. R. J. King and R. N. Wilson (1976), *Mineral. Mag.* **40**, 533.

Volborthite Monoclinic



Green crust on gypsum, near vanadiferous nodules in Keuper Marl in a brick pit at Glen Parva, Leicestershire. R. J. King and J. A. Dixon (1971), *Mineral. Mag.* **38**, 488.

Wittichenite Orthorhombic



Grains (< 0.5 mm) in bornite and digenite in the Tarnhead vein at Seathwaite, near Coniston, Lancashire. C. J. Stanley (1977), *priv. comm.* [Spencer considered Collins's (1871) record to be doubtful.]

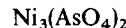
Wroewolfeite Monoclinic



Blue weathering product on ore from the Ladywell mine, Shelve, Shropshire, and from the Nant-y-cagal mine, Ceulanywaesmawr, Cardiganshire, Wales. P. J. Dunn and R. C. Rouse (1975), *Mineral. Mag.* **40**, 1.

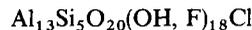
Also, with langite, posnjakite, brochantite, serpierite, etc., on sulphide ore from the dumps at West Blackcraig mine, near Newton Stewart, Kirkcudbrightshire, Scotland. A. Livingstone *et al.* (1976), *ibid.* **40**, 893.

Xanthiosite Monoclinic



Yellow earthy, with green aerugite, quartz, and arsenides near the south shaft at South Terras mine, St. Stephen-in-Brannell, Cornwall. R. J. Davis, M. H. Hey, and A. W. G. Kingsbury (1965), *Mineral. Mag.* **35**, 72.

Zunyite Cubic



Small intergrown tetrahedra with dickite and alunite in a vein in a dolerite sill at Embleton quarry, near Cockermouth, Cumberland. Found by A. W. G. Kingsbury (1955); see footnote, *Mineral. Mag.* **32**, 418.