$\{Na_3\}[Al_2](Li_3)F_{12}$, a = 1[illegible] Å, cryolithionite. According to MENZER[71], the ionic distribution is in accordance with this formula.

2. Na^+: A number of garnets other than cryolithionite contain Na^+ ions in c sites.

$\{NaCa_2\}[Mn_2](As_3)O_{12}$ [72] (berzeliite)	a = 12.49 Å
$\{Na_3\}[Al_2](P_3)O_{12}$ [73]	a, not reported

See also 1, 3, 4, 8, 25, 27

Group I*B*

3. Cu^{2+}: a and c sites

$\{NaCa_2\}[Cu_2](V_3)O_{12}$ [74]	a = 12.423 Å
$\{CuGd_2\}[Mn_2](Ge_3)O_{12}$ [43] (tentative)	12.475

See also 1.

Group II*A*

4. Mg^{2+}: c and a sites

$\{Mg_3\}[Al_2](Si_3)O_{12}$ [16,28]	a = 11.459 Å
$\{Gd_3\}[Mg_2](GaGe_2)O_{12}$ [43]	12.425
$\{MgGd_2\}[Mg_2](Ge_3)O_{12}$ [43]	12.31
$\{MnGd_2\}[MgMn](Ge_3)O_{12}$ [43] (probable distribution)	12.395
$\{Ca_3\}[TiMg](Ge_3)O_{12}$ [43]	12.35
$\{Ca_3\}[ZrMg](Ge_3)O_{12}$ [43]	12.514
$\{NaCa_2\}[Mg_2](V_3)O_{12}$ [74]	12.446
$\{Y_3\}[Mg_xFe_{2-x}](Fe_{3-x}Si_x)O_{12}$ [7]	
$\{Gd_3\}[Mg_xFe_{2-x}](Fe_{3-x}Si_x)O_{12}$ [75]	

See also 1, 17, 25, 33*a*.

[71] G. MENZER, Die Kristallstruktur von Kryolithionit. Z. Kristallogr. 7[illegible] (1930) 265–287.

[72] F. MACHATSCHKI, Berzeliit, ein Arsenat vom Formel- und Strukturtypus Granat ($X_3Y_2Z_3O_{12}$). Z. Kristallogr. 73 (1930) 123–140.

[73] E. THILO, Über die Isotypie zwischen Phosphaten der allgemeinen Zusammensetzung $(Me_1)_3(Me_2)_2[PO_4]_3$ und den Silikaten der Granatgruppe. Naturwiss. 29 (1941) 239.

[74] A. DURIF, Sur quelques composés non silicates isomorphes des granats. Int. Conf. on Physics of the Solid State and Application to Electronics and Telecommunications. Brussels, Belgium (1958) pp. 500–502.

[75] S. GELLER, H. J. WILLIAMS, R. C. SHERWOOD and G. P. ESPINOSA, Magnetic and crystallographic studies of substituted gadolinium iron garnets. J. Appl. Physics 36 (1965) 88–100.

5. Ca^{2+}: thus far, all evidence points to preference for c sites.

There is some indication that Ca^{2+} ions may enter a sites: RINGWOOD and SEABROOK[76] have reported a pressure induced $CaGeO_3$ with garnet structure, i.e. $\{Ca_3\}[CaGe](Ge_3)O_{12}$. We have performed high-pressure experiments on this system and have not obtained a cubic material in any case. The powder photograph of one of the specimens appears to be indexable on a tetragonal cell with a = 12.51, c = 12.36 Å. The structure does appear to be closely related to that of the garnet. Thus far, we have not obtained single crystals which are required for a structure determination. For examples of Ca^{2+} ion in the garnets, see Tables 3–5 and the many other examples in this survey.

6. Sr^{2+}: c sites

In the earlier survey[8], I had said, "enters c sites but there is no known garnet in which Sr^{2+} ions *fill* the c sites". This was misinterpreted by MILL'[49] to mean that I had said that "Sr^{2+} is too large to fill all the dodecahedral positions and can only replace other cations partially...". He then counters this by giving examples of hydrogarnets, which he writes $3SrO \cdot Ga_2O_3 \cdot 6H_2O$ and $3SrO \cdot Al_2O_3 \cdot 6H_2O$. Leaving aside the misinterpretation of my remark, I do not consider the hydrogarnets to be *isostructural* with the garnets. *Thus* at the time I wrote the earlier paper, the statement was correct. Since then MILL' has produced a number of interesting garnets with Sr^{2+} ions filling the c sites; these are listed in Table 4. Nevertheless, the first indications that substantial amounts of Sr^{2+} ion would enter c sites were given in 1960:

$\{Sr_{0.5}Y_{2.5}\}[Fe_2](Fe_{2.5}Ge_{0.5})O_{12}$ [43]	a = 12.414 Å
$\{Sr_{0.5}Y_{2.5}\}Sn_{0.5}Fe_{4.5}O_{12}$ [77]	12.49
$\{SrY_2\}SnFe_4O_{12}$ [77]	12.61

7. Ba^{2+}: small amounts are known to enter c sites[77]

[76] A. E. RINGWOOD and M. SEABROOK, High pressure phase transformations in germanate pyroxenes and related compounds. J. Geophys. Res. 68 (1963) 4601–4609.

[77] S. GELLER, R. M. BOZORTH, M. A. GILLEO and C. E. MILLER, Crystal chemical and magnetic studies of garnet systems $M_3^{2+}Fe_2Sn_3O_{12}$–$Y_3Fe_2Fe_3O_{12}$. J. Physics Chem. Solids 12 (1959) 111–118.