At the level in the earth's crust at which the magma consolidated, probably a shallow one, there was no quantitatively important assimilation of the limestone and other included rocks. The local development of garnet in the quartz monzonite is evidence of only feeble contamination. The evidence here described provides no solution to the riddle of the fate of the vast quantity of sedimentary and igneous material which was removed by stoping to make room for the batholith.

Green Diopside

Morphology. The diopside from the limestone inclusions occurs in drusy crusts of close-set olive-green crystals 1–3 mm. in diameter and in single yellow-green crystals, up to 12 mm. across, emplanted on the calcite matrix. The smallest crystals are suitable for exact measurement on the goniometer. The following forms were determined on three crystals which are representative of the occurrence: *c*(001), *b*(010), *a*(100), *m*(110), *z*(021), *p*($\bar{1}$01), *u*(111), *s*($\bar{1}$11), *o*($\bar{2}$21), λ($\bar{3}$31), *I*($\bar{2}$11), γ($\bar{1}$51). The following two-circle angles measured on one twin crystal are in very close agreement with Goldschmidt's[5] calculated angles for diopside:

Forms	No. of faces	Measured		Calculated	
		φ	ρ	φ	ρ
b 010	2	0°00′	90°00′	0°00′	90°00′
a 100	2	89 59	90 00	90 00	90 00
m 110	4	43 34	90 00	43 33	90 00
z 021	4	13 32	50 34	13 32½	50 29
s $\bar{1}$11	2	−25 14	33 05½	−25 07½	33 04
o $\bar{2}$21	1	−35 07	55 21	−35 22	55 19½
γ $\bar{1}$51	2	−5 18	71 25	− 5 21½	71 20

The twelve forms observed are all among the well-known forms of monoclinic pyroxene and, except for *I*($\bar{2}$11), they are among the commoner forms of this form-rich species. Figures 2 and 3 illustrate typical crystals which closely approach the ideal symmetry of the drawings. Single crystals (Fig. 2) are few; most of the crystals are contact twins (Fig. 3) after the common pyroxene law: twinning by reflection in (100) with composition on this plane. The crystals do not vary greatly in habit. In the prism zone *m* is large, *a* and *b* narrower; on the terminations *c z u s o* γ are commonly present; *p I* λ are rare. Figure 4 is a gnomonic projection of the observed forms; it shows that the common form γ($\bar{1}$51), with its complex symbol and small reticular density, is in simple zonal relation to the principal forms.

[5] *Winkeltabellen*, Berlin, **1897**.

Optics. The optical elements of the green pyroxene were obtained from a thin section mounted on the universal stage and by the immersion of whole crystals and crystal grains. The plane of the optic axes lies in the plane of symmetry; Z (acute bisectrix) lies in the obtuse axial angle β, inclined to the c-axis at 39°; $2V=62°$; dispersion $r>v$ weak; indices of re-

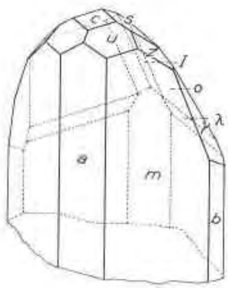

Fig. 2

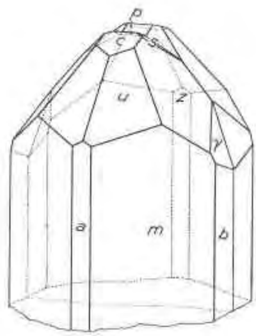

Fig. 3

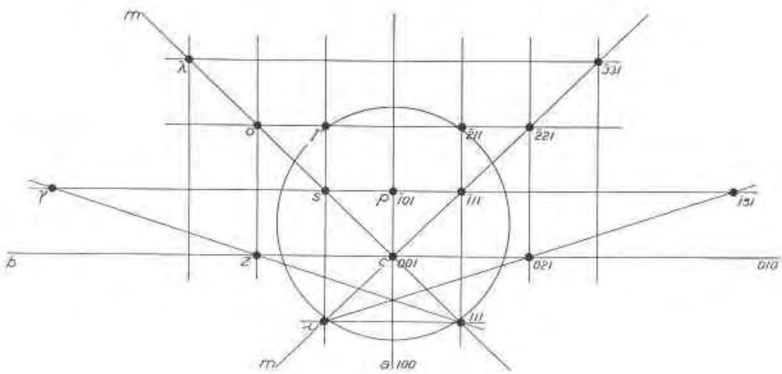

Fig. 4

FIG. 2. Diopside: typical untwined individual.
FIG. 3. Diopside: typical twin.
FIG. 4. Diopside: gnomonic projection showing accepted forms.

fraction: $\alpha=1.672$, $\beta=1.679$ (calculated from 2V), $\gamma=1.704$, all ± 0.002. These values are close to those given by Larsen and Berman[6] for a nearly pure light green diopside.

Composition. An analysis by F. A. Gonyer, undertaken mainly to test for the presence of chromium, shows that the pyroxene is an unusually pure diopside.

[6] *U. S. Geol. Sur.*, Bull. **848**, p. 243, no. 15, 1934.

	1	2
SiO_2	53.10	55.55
TiO_2	0.17	—
Al_2O_3	2.55	—
Fe_2O_3	0.00	—
Cr_2O_3	0.00	—
FeO	0.97	—
MnO	0.08	—
MgO	17.25	18.52
CaO	25.80	25.93
H_2O	0.04	—
	99.96	100.00

1. Green diopside in limestone xenolith, near South Canyon, E. side of Organ Mts. 15 miles S. of San Agustin Pass, New Mexico.

2. $CaMgSi_2O_6$.