described by Zincken (1829), Cissarz (1930), and Schneiderhöhn and Ramdohr (1931) is almost certainly not a simple palladium amalgam.

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A NOTE ON SO-CALLED "PRESSURE INDEPENDENT" MINERALS

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In a recent note on the stability and synthesis of uvarovite, $3CaO \cdot Cr_2O_3 \cdot 3SiO_2$, Glasser (1959) objected to a statement by Hall (1958) which tended to give the impression that uvarovite, like diamond, is

stable only at pressures of the order of 20,000 to 35,000 bars. Glasser then went on to state: "Uvarovite—and several other members of the garnet series mentioned *by Hall*—are 'pressure independent' minerals, inasmuch as they also have a thermodynamic stability range at 1 atm. pressure. Hall was apparently unaware of the work of Hummel," (1950) who succeeded in preparing uvarovite at 1 atm. pressure and between 885° and 1400° C.

It should be pointed out, however, that the term "pressure independent mineral" is highly misleading in this context, since it implies that the stability field of such a mineral is actually independent of pressure, something which can only be the case when the phase boundary delineating the stability field of such a mineral in the P-T plane—in the case of uvarovite the phase boundary expressed by

$$3CaSiO_3 + Cr_2O_3 \rightleftharpoons Ca_3Cr_2Si_3O_{12}$$

is a straight line parallel to the pressure axis, *i.e.* with dP/dT infinite. The requirement for this to happen is that ΔV for the reaction be zero, while ΔS be unequal to zero. This is certainly not true for the above reaction, and is, in fact, an extremely rare occurrence for reactions such as the one above or ordinary first-order transitions. Actually, the phase boundary under discussion may be expected to intersect the T-axis at $1370° \pm 10°$ C. (4) and to have a positive slope in the P-T plane, since the garnet is the denser assemblage.

As any geologist knows, geological nomenclature abounds with misnomers, and it would be unfortunate if another is unnecessarily added. One certainly is not justified in ascribing the term "pressure independent" to a mineral merely because it has a thermodynamic stability range at 1 atmosphere.

It is hoped that these remarks will in no way detract from the main point of Glasser's note, with which the present author is completely in agreement.

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