YAMATO 981651, A NEW VARIETY OF THERMALLY UNMETAMORPHOSED EUCRITE: VESICULAR, MAGNESIAN AND INCOMPATIBLE ELEMENT-POOR. Paul H. Warren, Institute of Geophysics, UCLA, Los Angeles CA 90095-1567, USA (pwarren@ucla.edu).

Yamato 981651 is a 236 g eucrite that has been briefly described by Kojima and Imae [1], who established the rock's affinity with eucrites based on pyroxene FeO/MnO and oxygen isotopes. The rock contains vesicles up to 3 mm across. For reasons unstated, Kojima and Imae [1] suggested it is an impact melt rock.

The vast majority of eucrites have had their pyroxene (etc.) brought into tight compositional ranges by thermal metamorphism. Y-981651, however, has remarkably pristine (unmetamorphosed, "unequilibrated") mineralogy. It is also uncommonly magnesian. Based on analyses to date (105), the record of pyroxene crystallization starts at $En_{72}Wo_{4.7}$, i.e., at an *mg* ratio several mol% higher than observed for other unmetamorphosed eucrites such as Bluewing 001 [2]. If Y-981651 is assumed to be an impact melt rock, the origin of its high-*mg* component is problematical. If it were diogenitic, we might expect the Y-981651 pyroxene trend to be uncommonly Ca-poor in comparison to other unmetamorphosed eucrites. Instead, on a pyroxene quadrilateral the early Y-981651 pyroxenes plot consistently several mol% higher in Wo than corresponding pyroxenes from Bluewing 001. However, Y-981651 is also an exceptionally fast-cooled lava, almost vitrophyric; and probably as a result of the rapid cooling, its pyroxenes are uncommonly rich in Al; and perhaps thus in Wo, as well. Siderophile elements that are commonly detectable by INAA in polymict eucrites (Ir, Ni) are not detectable in Y-981651. A forthcoming RNAA analysis for these and other siderophile elements will help to further constrain the impact melt hypothesis.

On a plot of pyroxene *mg* vs. Ti/Al ratio [2], Y-981651 gives an indication of crystallization starting with an uncommonly low TiO_2. Preliminary bulk-rock INAA data likewise indicate uncommonly low concentrations, by noncumulate eucrite standards, of Ti and incompatible trace elements such as Sm.

References: [1] Kojima H. and Imae N. (2001) *Meteorite Newsletter*, v. 10, no. 2. [2] Warren P. H. [2002] *LPS* abstract.