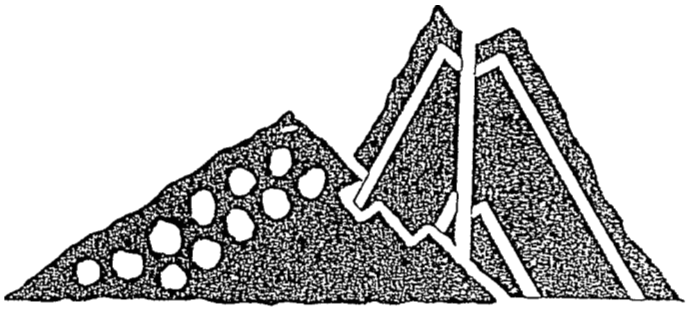

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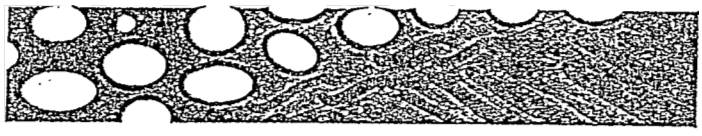
ABSTRACTS



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ANCIENT VOLCANISM & MODERN ANALOGUES

3. Resumé

BASALTIC TO DACITIC TUFFS RELATED TO CALDERA FORMING EVENTS IN VOLCANOES FROM NEW HEBRIDES.

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The large calderas of Ambrym and Santa Maria -mainly basaltic volcanoes- have been previously considered to be formed by quiet subsidence. Thick pyroclastic deposits lead us to reconsider the problem of their formation.

Forming a large tuff cone around a 12 km-wide caldera, the Ambrym Pyroclastic Series (APS) consists of lower pyroclastic flow deposits, dacitic in composition, thick mafic sequences of bedded vitric (Surtseyan-like) tuffs, basaltic ash flow deposits and strombolian deposits. The Santa Maria Pyroclastic Series (SMPS) is well exposed along the southeastern and northern coasts of Santa Maria as well as on the cone surrounding the caldera. It consists of ash flow deposits bearing quenched juvenile lapilli and cauliflower bombs, often reworked as lahars, and associated with Plinian fallout and hydromagmatic deposits.

Compositions range from medium-K calc-alkaline basalt to dacite, with peaks at 50%, 54% and 66% SiO_2 in the APS, and from basalt to andesite-dacite (51-63.5% SiO_2) in the SMPS. For comparison, the petrology of basic and intermediate ignimbrites from Tanna (51 to 69 % SiO_2) is presented. These compositions represent the magmatic signature of voluminous layered chambers.

Interpretation of tuff series implies both explosive and collapse mechanics during caldera formation. The role of external water (without which the mafic magmas would not have probably erupted) is emphasized.

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