SHORT COMMUNICATIONS

SULPHIDE MINERALIZATION AROUND AMBADUNGAR, BARODA DISTRICT, GUJARAT

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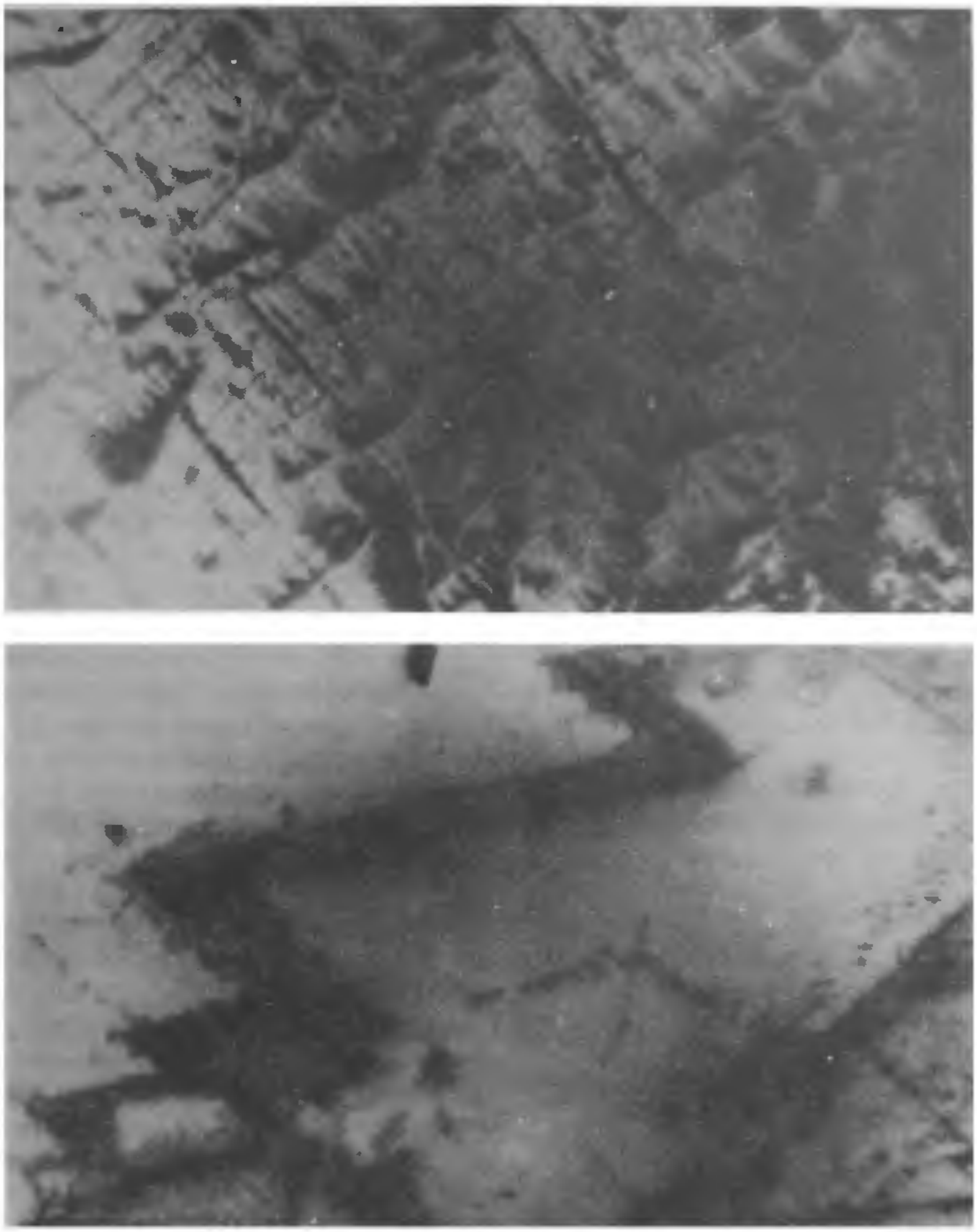
SULPHIDE mineralization around Ambadungar (Survey of India Toposheet No. 46 K/1; 22°1′ N: 74°4′ E) is being reported for the first time. The Ambadungar alkali–carbonatite complex is well known for its fluorite mineralization[1,2]. The proved reserves of fluorite are now close to being exhausted. The purpose of this note is to present the results of the study of the ore-minerals. The stratigraphic succession in Ambadungar complex may be summarized as:

Alluvium	Recent to sub-Recent
Alkaline–carbonatite complex	Eocene and later (37.5 ± 2.5 Myr)[3]
——— Non-conformity ———	
Deccan traps	Late Cretaceous to Eocene/Oligocene (65 to 50 Myr)[4,5]
——— Minor unconformity ———	
Bagh beds	Cretaceous
——— Major unconformity ———	
Granite gneiss forming basement	Dharwarian[6]

The sulphide mineralization is associated with carbonatites at a deeper level in a tunnel opening about 40 m below the present working bench.

Polished ore sections have been studied following standard texts on determinative aspects[7,8]. Identified ore species include galena, pyrite, sphalerite and chalcopyrite, while the gangue minerals are fluorite, calcite, quartz and dolomite. Galena shows intergrowth texture with the fluorite. Triangular cracks are filled with sphalerite and pyrite. The large grain size and associated fluorite suggest undisturbed crystal growth in large cavities (figure 1). Cleavage is quite distinct in pyrite and harder than the chalcopyrite and sphalerite (figure 2).



Figures 1 and 2. Photomicrographs (×75) of sections of ores from Ambadungar. **1,** Polished galena showing intergrowth texture. Sphaleritic vein is also observed. **2,** Polished pyrite showing cleavage traces. Associated ores are chalcopyrite and sphalerite.

Both Pb and Zn occur as galena and sphalerite in veins and late-stage replacement carbonatitic phases; galena is somewhat more widespread (cf. Kaiserstuhl occurrence)[9]. From trace-element studies[10,11] the high concentrations of Ba, Sr, REE, etc., and of CO_2, F, P, Cl, S, etc. are considered typomorphic for magmatic processes. In local secondary ultrabasic and basic magma chambers, rich in Ca and Mg, large amounts of $CaCO_3$ and $MgCO_3$ are formed in the final phase of magmatic crystallization. Calcite and, rarely, dolomite carbonates terminate intrusive alkali series and the association of alkali basalt magma (picrite) and components of alkaline rocks including nepheline syenite (phonolite) and phono-nephelinite together with components of carbonates are formed in the late stage[12].

The occurrence of sulphides of Pb, Cu, Zn, etc. in substantial amounts indicates a high-temperature

(telethermal) environment, and the prospect of encountering more fluorite at deeper levels is negated.

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