the soil (about 1.5 m thick) contains gravels and pebbles.

The carbonized fossil wood was dated at the Birbal Sahni Institute of Palaeobotany, Lucknow by carbon-14 dating method. The age is furnished as 3580 ± 110 years B.P. (BS - 616). The age of the fossil wood encountered in the foundation excavations of the Dhom dam near Wai has been reported to be 38480±8940-4125 years B.P.\(^1\)

It is noted that the fossil wood from Dhom dam was encountered at 8 m below the present river bed level and is about 10 times older than the one from the Warna dam encountered at 2 m above the present bed level. It is also noted that both the localities fall in almost identical geologic, geomorphic and climatic environments. The lateite duricrust levels in the Dhom dam vicinity (i.e. Mahabaleshwar) are above the laterite levels in the Warna dam vicinity. The difference in altitude is about 520 m. The notable difference in age of the deposits and laterite duricrust levels appears to be due to post-trappean tectonic activity in the area.

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**FELSIC VOLCANICS FROM THE KHETRI COPPER BELT, RAJASTHAN**

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The Delhi Supergroup of rocks (1600 m.y.) covers an area of about 36,000 km\(^2\) over a NE-SW strike length of about 800 km from Delhi in north to the Rajasthan-Gujarat border in south. It consists of 10,000 m of thick pile of meta-sediments and metavolcanics grouped into three distinct lithofacies viz. lower calcareous (Raialo group), middle rudaceous and arenaceous (Alwar group) and upper argillaceous (Ajabgarh group). Definite indications of volcanism towards the end of sedimentation are provided by basic flows. After Heron's\(^1\) regional work on north-east Rajasthan, Das Gupta\(^2\) gave a fair account of the geology of Khetri Copper Belt where members of Alwar and Ajabgarh groups are well-developed. Although Das Gupta briefly mentioned about a 'possible andesite' near Udaipur (27º44' : 75º29'), the association of felsic volcanics in Delhi Supergroup is described for the first time from the central part of the Khetri Copper Belt (figure 1).

The metamorphites of the central part of the Khetri Copper Belt are disposed in the form of a large scale antiformal anticline, the core of which is occupied by granitoid bodies. The felsic volcanics, represented by fine-grained tuff, crystal tuff and lithic tuff, are located on the western part of the above mentioned regional fold and occur as conformable beds within the grey-banded phyllitic quartzite and carbon phyllite of the Ajabgarh group. A maximum thickness of about 25 m is recorded in the volcanics 3 km north-east of Udaipur. Crystal tuff and lithic tuff occur as thin layers, rarely exceeding 1 m, within the fine-grained tuff having sharp as well as gradational contacts. The volcanics show imprints of Delhi deformation in the form of tight folds and a penetrative axial plane cleavage. Vesicles and amygdules, well-developed in fine-grained tuff, are stretched in the cleavage planes. In less-deformed areas, however, a high
angle relationship between layering and vesicles is still retained (figure 2).

The fine-grained tuff is dark grey, finely laminated and often vesicular. The vesicles are 2 mm to 10 mm in diameter and are filled with soft friable or hard carbonaceous matter. In thin section the rock is mainly composed of anhedral quartz set in a fine-grained groundmass of quartz and sericite, which show a perfect dimensional orientation. The crystal tuff is also dark grey, hard and porphyritic with 1–2 mm subhedral to euhedral white feldspars and globules of colourless quartz set against the dark grey groundmass (figure 3). Under microscope, the rock has a well-developed porphyritic texture defined by subhedral to anhedral quartz embedded in the medium grained devitrified groundmass with remnants of glass still preserved. Spherulitic texture is rarely seen (figure 4). Feldspars have completely altered to kaolin with indistinct to poorly preserved grain boundaries. Sometimes quartz phenocrysts show embayment texture. Polygonization of quartz grains and recrystallized quartz veins are common. The chemical analysis of one sample of the fine-grained tuff shows SiO₂ 70.64%, TiO₂ 0.48%,

Figure 2. Vesicles in the fine-grained tuff showing high angle relationship with bedding (S₁) north-east of Udaipur.
bution of the fine-grained tuff to the crystal tuff and lithic tuff is 95:5. Their widespread distribution and association with carbon phyllite and grey banded phyllitic quartzite, as observed in this part of the Khetri Copper Belt, can be used as a stratigraphic marker horizon because they are deposited within a short period.

It is interesting to note that most of the copper occurrences in this part of the Khetri Copper Belt are confined to the carbon phyllite or dark grey-banded phyllitic quartzite, which are interbanded with the felsic volcanics. Bowen and Gunatilaka point that fine-grained carbonateous argillites near the felsic volcanics are favourable hosts for ore mineralization. It is, therefore, quite possible that the copper mineralization of the area is of volcanic origin (cf. studies by Jairath). This appears more convincing in the light of recent studies by Ray, Gangopadhyay and Bose who have refuted any role of the neighbouring granites on the sulphide mineralization of the area.

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1. Heron, A. M., Mem. Geol. Surv. India., 1917, 45, 128.