

Meteorite or meteor‘wrong’

Meteoroids that enter the Earth’s atmosphere are seen in night sky by the light streak produced due to excess heat as they travel through the upper atmospheric layers. Meteor showers, commonly referred to as shooting stars, are always a fascination for (amateur) sky watchers and space scientists. At high velocities, upon interaction with the Earth’s atmosphere most of the pristine material is either vapourized and/or broken into pieces, ranging from a few microns to a few centimetres, in the atmosphere before it reaches the surface; those reaching the Earth’s surface are termed as meteorites. Meteorites are of interest due to their nature of origin; they are believed to preserve the secret on the formation of solar-system objects, their evolution and hold the clue on the origin of life.

Places of interest for a meteorite hunter could be the Antarctic plains where meteorite gardens can be easily found in the icy white landscape. Conversely, according to H. H. Nininger (The Meteorite Man), there should be at least one meteorite for every square mile on Earth, to that in spite of difficulty large numbers had also been found in various landscapes across the continents. Search

for meteorites is being carried out at various locations around the world. Those recorded to date include collections at places of meteor showers as well as those discovered elsewhere by chance.

A huge rock on the roadside, near Bediganahally village adjoining National Highway NH-48, connecting Bangalore and Channarayapatna (Hassan district) in Karnataka, India, became the centre of attraction as a meteorite unrecognized for decades following media claims (*Deccan Herald*, 19 July 2012). A few days later the report was disputed (*Deccan Herald*, 23 July 2012, and *The Hindu*, 24 July 2012) with emphasis on further scientific analysis before calling it a meteorite.

With the help of Department of Mines and Geology we had the opportunity to examine the rock and landscape in further detail. Samples were taken from the rock, under dispute, as well as from rocks in the surrounding area, inside a kilometre. The rock samples obtained were then subjected to physical and chemical analysis in the process of identifying whether it is a meteorite or a meteor‘wrong’ (terrestrial rock mistaken to be a meteorite). While collecting samples from the huge rock there were no evidences of a fusion crust; an important first physical signature for a meteorite was missing. We also found signatures of different materials, like quartz vein and granite inclusions, embedded on the surface of the huge rock, clear signatures of a meteor‘wrong’. Upon application of force, using a hammer, we found that the rock is a rather soft material that would not have survived the forces during fall into the Earth’s atmosphere so as to remain as one huge piece. In addition, the rock was also found to contain large quantities of mica, apparent signatures of a meteor‘wrong’. While we were in search for similar rocks in the neighbourhood, we came across several sharp-edged blocks of rocks.

Paying more attention to the landscape we even saw several such rocks extending further from the place where we collected our samples for analysis. Portions of all such rocks, including the one under study, were found to have been buried in

a mantle of soil suggesting that they could be the outcrops of a belt of rocks. To our surprise, similar rocks were seen in adjoining villages like Mallavanagatta, where the outcrops are aligned in the same direction. The rocky outcrop seen in the place of study was identified as quartz mica schist and the Department of Mines and Geology confirmed that the place of study is a part of the Nuggehalli schist belt and it is quite common to see such schist rocks in the locality. Thus we were convinced that we were looking at a meteor‘wrong’; however, we subjected the sample to preliminary chemical analysis, finding the chemical composition using a scanning electron microscope (SEM). All the samples displayed higher oxygen content of up to 50%, whereas the rest of the major components were found to be Al and Si together with traces of Mg, Na and K, a chemical composition that is characteristic of a terrestrial rock (Figure 1). Hence it is convincing that even preliminary analysis in such a case is more than enough to conclude that the rock claimed to be a meteorite is in reality a meteor‘wrong’.

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B. SIVARAMAN^{1,*}
V. JAYARAM²
H. P. HARISH³

¹*Department of Inorganic and Physical Chemistry and*

²*Solid State and Structural Chemistry Unit,*

Indian Institute of Science, Bangalore 560 012, India

³*Department of Mines and Geology, Mineral Division, Hassan 573 201, India*

**For correspondence.*

e-mail: bsivaraman@ipc.iisc.ernet.in

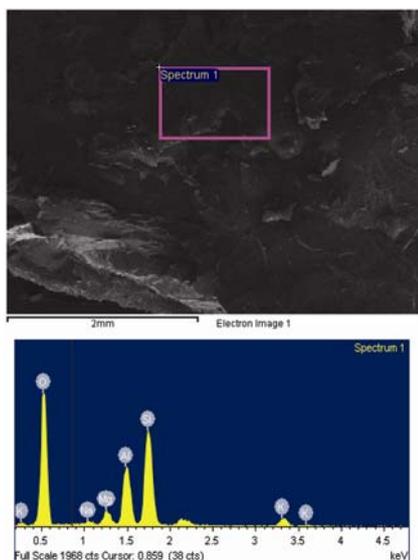


Figure 1. SEM photomicrograph of the sample taken from the huge rock. Spectrum 1 shows the scanned area to obtain the chemical composition.