GEOPHYSICAL INVESTIGATIONS NEAR THE OLD WORKINGS FOR COPPER IN YANAMBAIL* AREA, KHAMMAM DISTRICT, ANDHRA PRADESH

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ABSTRACT

The old workings for copper, two miles north of Yanambail were first brought to light by Prof. C. Mahadevan, during his work in the Hyderabad Geological Survey 1941–43.

Self potential, Resistivity and Magnetic methods of geophysical investigations were carried out by the authors near the old workings in an area of about 100 acres covering the entire old workings their strike continuation and in their neighbourhood. Negative centres were obtained near the old workings indicating the possible presence of richly concentrated copper ore body from about 30 feet depth. Another group of Negative centres of high magnitude were also found at a distance of about 500 feet towards East of old workings along a run of quartz vein. They are possibly due to the presence of another parallel mineralised vein.

INTRODUCTION

YANAMBAIL is a small village on the left bank of Kinnerasani about 8 miles north of Paloncha in Khammam district (East longitude = 80° 40' North latitude = 17° 41').

The old workings for copper, two miles North of Yanambail were brought to light first by Prof. C. Mahadevan during his regular survey work as an Officer of Hyderabad Geological Survey, in the year 1943, who mapped the area on a 1" = 2 miles scale.

The formations consist here of alternate bands of phyllites, dolomitic marbles and quartzites with concordant intrusions of quartz veins, the junction between the marbles quartzites, and phyllites is well defined. The phyllites are mostly salicitic and occasionally slightly carbonaceous. They strike near the old workings NNE–SSW and dip 70°–80° to the West, sometimes being almost vertical.

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The old workings for copper are situated about 1 mile to the west of the hill range of Karagutta and are on level ground. They run in the strike direction over a length of 1000' with a maximum width of 50' and a maximum depth of 25' from the general ground level. Chalcopyrite, malachite, and less frequently cuprite, and other copper ore minerals occur in profusion in the debris filling the old workings. Detailed prospecting by trenching was conducted by a party of teachers and M.Sc. students of the Departments of Geology, of Andhra University and Osmania University, in the months of May and June 1957. Simultaneously the teachers and students of Geophysics Department, Andhra University, carried out detailed geophysical investigations in the old workings and vicinity. The results of geophysical investigations are recorded here.

**METHODS OF WORK**

The basic principle of the geophysical methods is the measurement at surface, of the differences in physical properties of the subsurface geological bodies. Since the ore body near the old workings is chalcopyrite which is susceptible for oxidation, resulting in natural earth currents, intensive self-potential survey of the area was undertaken. To supplement the self-potential work, resistivity and magnetic work was also done.

When ore deposits get oxidised, natural earth currents are produced as a result of which the ground immediately above the ore body becomes an area of negative potential with respect to all distant points at the surface. The point of maximum negative potential in the area is known as the "negative centre" and it is the location of these "negative centres" which is the main objective when the self-potential method is used for prospecting purposes.

For the purpose of the geophysical work a grid was laid down in the area with traverses ESE–WNW (i.e., N 113° E) perpendicular to the general strike direction of the formations there (*vide* Fig. 1). The distance between any two consecutive traverses was 100' and on each traverse stations were fixed at 50' interval marked by pegs. An arbitrary point about 500' west of the old workings was taken as the base station and was denoted as 0/0 station and all the potentials were measured with respect to this point. The traverse passing through this point was called '0' traverse and the traverses towards north of this line were denoted as 1N, 2N, 3N, etc., which were at a perpendicular distance of 100', 200', 300', etc., respectively from the '0' traverse. Similarly traverses towards south were denoted as 1S, 2S, 3S, etc. The stations on each traverse towards the east of the reference point were denoted as 1E, 2E, 3E, etc. A total number of 19