

## APPLICATIONS OF GEOPHYSICAL METHODS IN THE SEARCH OF METALLIC ORE DEPOSITS IN CHINA

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During the past few years, geophysical methods have been extensively used for the investigation of metallic ore deposits throughout the country. They made good successes and also gave not so satisfactory results, too. Magnetic prospecting enjoys the highest prestige among the geophysicists and geologists. With it we have found a number of magnetite deposits not exposed on the surface; some of them consist of big ore bodies. It is also successful in locating other magnetite-bearing ore deposits, like copper ores, etc. Magnetic work is carried out both from the air and on ground. The aeromagnetic survey by means of the fluxgate-type magnetometer is also employed in mapping igneous rock masses, such as ultra-basic rocks and to study geological structural questions. But to non-magnetic ore bodies, the magnetic method can scarcely do anything.

The self-potential method has also been widely used, but it was found that only a very few of the anomalies are of ore origin. In the search of pyrite or pyrite-bearing ore deposits we have several successful examples.

The equipotential line method survey covering large areas for locating conducting ore zones, particularly copper-bearing massive pyrite deposits has been carried out. Beautiful anomalies can be located directly above the buried ore bodies, but many of them are related to black-shale layers which are also conducting and sources of spontaneous polarization.

Geochemical methods, i. e. spectroscopic analysis of soil and rock samples for metal elements has been proved useful in certain cases. It is now widely employed to find lead-zinc, copper, molybdenite deposits.

Gravity method has been used only in a few cases. Examples of them are gravity meter surveys on massive copper-bearing pyrite ore bodies and iron ore bodies, giving good anomalies. Torsion balance surveys on chromite ore bodies give many anomalies arising from buried gabbro rock masses.

Application of the radio-active method has been restricted to the search of radioactive ore-bodies of very shallow burial. The work is performed from air, on ground and also in drill holes. Besides, the

well logging technique for exact differentiation of coal beds and also boundaries of certain metallic ore bodies in drill holes, is a very useful geophysical application.

Geophysical investigations of metallic ore deposits though as yet only commencing have broad future. It is necessary to do a great deal of research work before we can obtain still better results. Complex use of several methods on the same ore occurrence is extremely necessary, as in general not a single geophysical method can give all the informations required by the prospecting geologists.

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