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In-Depth Ophiolite Research Is Inseparable from the Drilling Engineering

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1 Abstract

Mankind has lived in the earth for countless years，but until now, people are not really understand the connotation of the Earth. We know that the earth composition including the lithosphere, asthenosphere, mantle, and core. The lithosphere supports all the life on Earth. For a long time, geoscientists trying to use all kind of methods such as geological, geophysical, and geochemical methods to detect and study the earth, but our knowledge about earth are mostly indirect. Through the direct observation to the lithosphere, people can understand and recognize the plate movement of ocean and the mainland, crustal stress, earthquakes, volcanic processes, deep resources, the origins of life, global climate change, and biodiversity. They are all the basis of a series of geoscience problems (Su et al., 2010).

For our daily lives，as we all know, against landslides, mudslides and other geological disasters, people's responses can only be monitoring, prevention and countermeasures are needed. One of the most important technical means is the drilling methods. For example, through engineering investigation drilling, people can understand the overall structure of the landslide. Through anchor nails, bolt, cable, curtain grouting, soil modification, anti-slide bored piles of construction, people can prevent landslides, collapse, and other geological disasters.

For geosciences, earth scientists are facing a lot of challenges. Plate tectonic theory is one of the 20th century's major scientific achievements. The continental drift assumptions put forward in the early 20th century, but until 1968, the "Geluoma • Challenger" ocean drilling vessel belong to United States had drilled several hundred holes in the ocean, the theory of seafloor spreading and plate subduction model has been confirmed directly by drilling. However, many problems cannot be explained by "Plate theory "on land. A continental dynamics theory is initiating and developing based on the internal driving force of continent. This heralded a landmark geological revolution is coming soon.

At the same time, the 21st century human survival and development resources, the environment and disaster reduction, and other issues need to be addressed urgently. All of this requires us to understand the deep Earth, and the only direct means of direct observation of the Earth's continental crust is "Continental Scientific Drilling".

Geological samples, especially those from deep of the Earth, are the most direct study subjects for geologists. But the only way to access the true samples from deep of the earth is drilling. The most direct evidence always originated from the deep of the earth, such as core, cuttings, fluid samples and other physical samples. This is also true for ophiolite researches.

Continental scientific drilling has been demonstrated as an efficient technique for directly obtaining information from the Earth's surface to the deep crust, and is acknowledged as "to build a telescope inserting to the interior of the Earth", as well as "a key for opening the door of the Earth". Over the past four decades, continental scientific drilling has achieved great success in enhancing our knowledge of the Earth, and in providing information on mineral resources, large engineering projects and global change. These benefits also relate to ophiolite research.

Along with China's Brahmaputra River intermittently distributed ophiolite sets. Its distribution in Tibet is more than 1,000 kilometres long and extends along the Brahmaputra and the Indian Ocean to Myanmar and Pakistan. We have completed a number of coring holes along this ophiolite belt in recent years. The cores were collected from these holes provide geologists with real physical samples coring from the depths of the earth, which have played a significant role in deepening their ophiolite research. And the coring drilling projects along

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this ophiolite belt will be continue for years, to continue to provide geologists enough ophiolite real samples for their researches.

No advanced drilling technology, no enough high quality samples from the deep Earth, the in-depth ophiolite research will be restricted (Zhang et al., 2013).

References

Su et al., 2010. *Acta Geologica Sinica,* 84(6):873–886.
Zhang X. et al., 2013. *Geology In China,* 40(3):681–693.