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News Release

GRADUATE RESEARCH CENTER OF THE SOUTHWEST

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RELEASE (Immediate)



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GRCSW SCIENTISTS PROBE EARTH'S INTERIOR THROUGH DIAMOND "PIPES"

DALLAS--

Rocks from the diamond-bearing volcanic throats of South Africa's Kimberley region are helping scientists of the Graduate Research Center of the Southwest to unlock secrets of the Earth's upper mantle.

The intent is to read the records of chemical combination, heat, and pressure written when the rocks were formed and the structure system closed.

Asst. Profs. Brian T. C. Davis and Ian D. MacGregor of the Geosciences Division have just returned to the Center after a two-month stay in South Africa. There they collected about a ton and a half of rocks which they believe were derived from the upper mantle. These rocks occur as peridotites and eclogites in Kimberlite pipes, ancient volcanic throats, which are the source of most of the world's diamonds.

The two scientists plan to analyze the minerals from the pipes to determine how the Earth's temperature and composition varied with depth when the rocks were put into position. Professor Davis and Professor MacGregor will duplicate the temperatures and pressures of the Earth's upper mantle. They will subject synthetic peridotites to pressures as great as 700,000 pounds per square inch and temperatures as high as 2,000 degrees Centigrade. Data from the analytical and experimental program will be used to construct models, patterns, of the upper mantle. These patterns will be compared with those derived by seismic, heat-flow, and electrical-conductivity studies.

(MORE)

GRCSW SCIENTISTS PROBE...

The opportunity to collect the samples is due to the courtesy of the Anglo-American Corporation of South Africa, a mining group. The project is being supported by a grant of \$39,600 from the National Science Foundation.

The Earth's mantle is well shielded by a crust 20 to 30 miles deep. It is almost impossible to sample directly, but it forms a major part of the Earth's structure. The diamond pipes offer one way of "reaching" into the mantle.

Diamonds are formed directly from carbon under intense heat and great pressure at depths of about 70 miles. The diamonds are pushed upward in blue-ground rock formations called pipes. The pipes resemble the throats of old volcanos.

Seventy miles down is well within the Earth's primary mantle. The peridotite is usually in a small lumpy form called a nodule. It is a granitoid igneous rock, fine grained and gray to black. An eclogite is a rock that is both igneous and metamorphic.

Professor MacGregor is a graduate of Aberdeen University in Scotland. He received his master's degree in geology from Queen's University in Canada and his PhD. in geology from Princeton. He joined the Center in March. He has won several awards and fellowships and has written extensively on geology.

Professor Davis is a graduate of Hamilton College in New York. He received his PhD. in geology from Princeton. He came to the Center last January. He also has written extensively for scientific publications.