

CAVE



The story of Olivier Islar's

record push into Doux de Coly

By WINREMLEY

OBSESSION

There are cave divers, and then there are cave explorers. Olivier Islar is a cave explorer in the first degree. Few cave divers, regardless of their skill level and experience would dare to undertake the ambitious exploration of the Doux de Coly cave system, which lies in the Dordogne region of France.



Olivier Islar

Win Remley

designed the custom tables used by Islar. The team recognized that they had a difficult task ahead of them. Of his project Islar said, "Diving far into a cave with a homemade rebreather is like flying into a cyclone to test the sturdiness of a jet."

The System

Doux de Coly is a large system with passages of varying shape from 30 ft. wide by 6 ft. tall to 10 ft. wide by 20 ft. tall. It is divided into three main sections: the entrance zone; the shaft; and the deep zone.

The entrance zone is fairly shallow averaging 20 ft. in depth and extends about 1,000 ft. to where the shaft begins. The shaft is a vertical tunnel that descends to the beginning of the deep zone at a depth of about 145 ft. The shaft is where the habitat was installed for extended decompressions. The deep zone ranges in depth from 145 to 190 feet and has been explored by Islar to 13,300 ft., (more than 4 kilometers).

There's only one significant restriction caused by a boulder fall that narrows to 60 in. wide by 30 in. tall. This was tight for Islar considering the size of his apparatus. Flow in the system is light with an average rate of 1 cu. m./sec. The water temperature is approximately 60°F.

Open Circuit Explorations

Doux de Coly was first explored by Islar in 1981 to 5,700 ft. using conventional scuba. In 1983 and 1984 additional penetrations were made to a maximum of 10,170 ft. using set up dives to place stage cylinders at 1,900 ft., 3,600 ft., and 4,900 ft. into the cave. Islar's custom scuba rig consisted of five back mounted cylinders pressurized to 3,675 psi for a total of 882 cu. ft. of gas. He began breathing from his quintet at 6,200 ft. into the cave where he dropped his last stage. He used the rule of thirds on all cylinders (one-third in, one-third out, one-third reserved for emergency). Although Islar had become obsessed

Islar, in an obsessive quest to push the Doux de Coly system past the practical limits of conventional scuba, designed and built a triple redundant, semi-closed, mixed gas rebreather and a custom decompression habitat to lay 13,300 feet of line at an average depth of 150 feet.

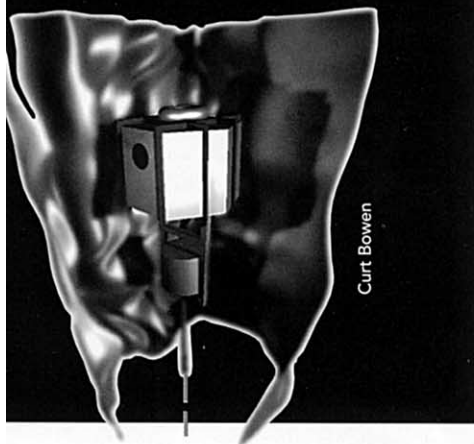
The multinational team of explorers included divers from France, Switzerland, Belgium, and the UK. Dr. Bill Hamilton of Hamilton Research,



Top: Islar's chest mounted redundant 2000 rebreather.

Middle: The RI 2000's "snap-fit" couplings enabled Islar to switch the cylinders from one rebreather to another while underwater.

Bottom: Artist rendering of the habitat Islar built and installed in the "shaft" for decompression.



Curt Bowen

with exploring Doux de Coly, he felt he had reached the practical limit of open circuit scuba in exploring this system

The RI 2000 Rebreather

Frustrated at not being able to push Doux de Coly further on conventional scuba, Islar and his exploration partner, Alain Ronjat, began looking into the use of a rebreather to continue the project. They closely examined units available from Dräger, and Cis-Lunar and decided that they were unsuitable for their particular mission. They instead began designing a home made rebreather, the RI 2000, that ultimately was used in Doux de Coly. The RI 2000 is a semi-closed rebreather, or rather two, fully independent, semi-closed rebreathers in a single back mounted case. A third independent semi-closed rebreather was also built as a thin streamlined unit to be chest mounted providing triple redundancy. Islar designed his rebreathers to all share the same set of cylinders via a unique snap-fit coupling that enables the cylinders to be connected to any of the three rebreather circuits while underwater.

The 1989 Expedition

In 1989, Islar made his first attempt to push Doux de Coly using his home made rebreather. From an exploratory point of view, the mission was a failure. He only managed to get to about 5,000 ft. The RI 2000 leaked at the snap-fit connectors due to the silt in the water. The scooters also broke down making further exploration impossible. It became obvious that a habitat would be required to manage the lengthy

decompression which was expected to be more than ten hours.

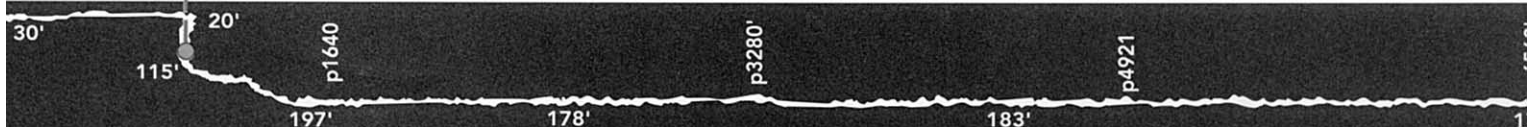
The Habitat

Islar and his team decided to construct a habitat and install it in the vertical shaft that begins about 1,000 ft. from the entrance. They considered a design consisting of a metal frame covered with a flexible sheet similar to that constructed for the Wakulla I expedition but rejected that design as too fragile for transport and installation into Doux de Coly. They instead created the habitat as a rigid housing constructed with aluminum and stainless steel. The habitat was transported to the shaft in three parts and assembled in place. The ballast weight for the habitat totaling 1,433 pounds was transported 26 pounds at a time by support divers. This activity took almost six days to complete.

Once the habitat was completed it was tested for functionality. The plan was for Islar to remove the bulk of his cylinders with the help of support divers at the bottom of the shaft. He then climbed into the habitat housing and sat in an armchair style seat. Islar was dry from the waist up and wet from the waist down due to the design and small size of the habitat. The habitat could be raised using a simple rope and pulley. While inside the habitat Islar continued breathing from the rebreather. Several cylinders were attached to the inside of the habitat to supply breathing gas during decompression. He changed cylinders and breathing gases via the snap-fit connectors.

Support divers could communicate with Islar by briefly sticking their heads into the air space inside the habitat. Once comfortable inside the habitat Islar could relax and rehydrate by drinking fluids.

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The Record Dive

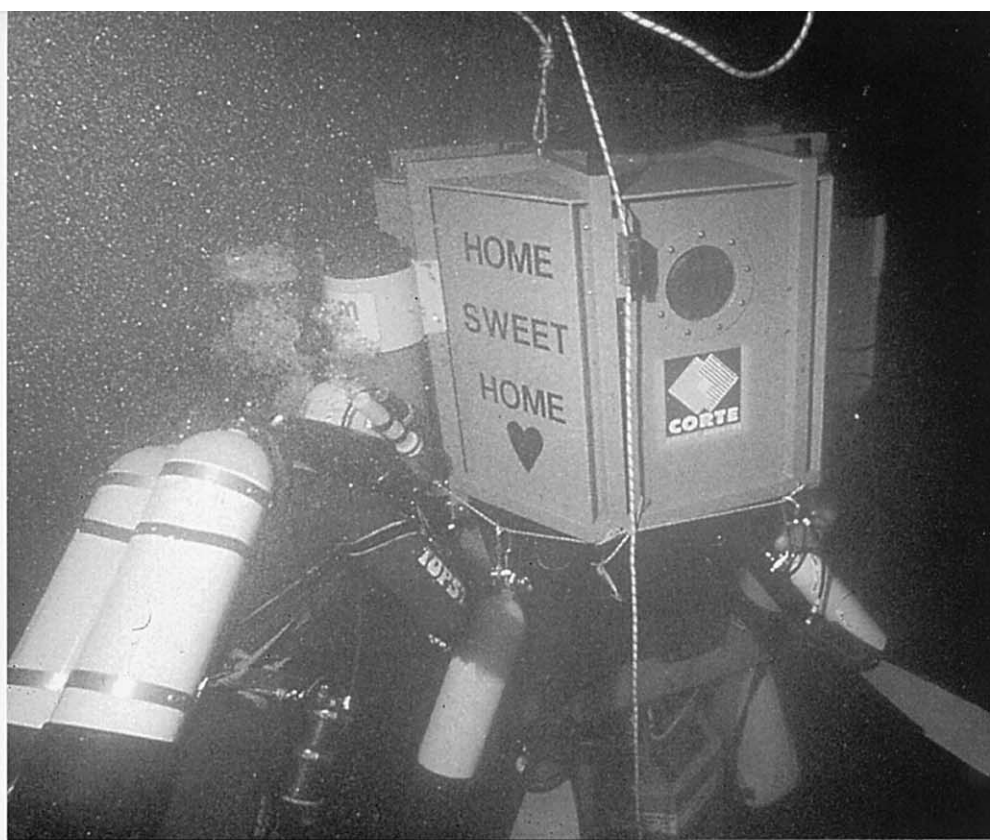
Still smarting from the failure of the 1989 expedition Islar and his team left nothing to chance. Every detail of the exploration was scrutinized. On July 29, 1991 he made his first attempt. He successfully pushed the system to 12,600 ft. without incident. The newly redesigned scooters and improved snap-fit couplings worked perfectly.

The record dive occurred six days later on August 4, 1991. Islar broke the 4 kilometer barrier by pushing Doux de Coly to 4055 meters or 13,303 ft. At about 13,250 ft. a large room opens up with at least two passages continuing on. Unfortunately the one Islar followed along the left side ended at 13,303 ft. which is where he turned his dive.

On the return, the injector on one of the dorsal counterlungs developed a leak, probably caused by silt in the water. This wasn't viewed as critical since the faulty rebreather circuit was still operating at about 50% capacity making it still usable. The more critical incident was caused by an over-zealous support diver who accidentally drowned one of the CO2 scrubbers. However, due to the triple redundancy, Islar was able to complete decompression without further incident. After exiting the habitat at the top of the shaft, the swim to the entrance was completed on pure oxygen from 115'.

The Future

Islar believes that rebreathers are the only way to make extreme pushes into cave systems. He acknowledges that this is increased risk exploration. He sees systems like Wakulla and Cathedral Canyon as an ideal opportunity for this type of technology. Islar and Ronjat currently have no plans for commercial production of the RI 2000. They see it more as a prototype that is still too heavy and clumsy to have commercial value. Islar would prefer that history simply record the RI 2000 and his explorations as valuable research and experience to be used to further future dive techniques. 🐟



Top: *Islars custom Decompression Habitat.*

Middle: *Islar rides his custom "Double-Scooter" into Doux deColy.*

Below: *Islar pauses briefly for a photo in the entrance tunnel with one of the local inhabitants.*

