

COCKLEBIDDY CAVE

The World's Longest Cave Dive

by

Peter Rogers

C.E.G.S.A. and C.D.A.A.

On Wednesday September 8, 1982 three push divers, part of a trip organised by Hugh Morrison from Perth, extended Cocklebidy Cave in Western Australia by one kilometre, increasing its total explored length to 4.5 kilometres. The major push dive involved each diver wearing three back-mounted scuba tanks and pushing between them an underwater sled comprised of another 15 tanks. Prior to the push dive an advanced base was established at the Rockpile Chamber, an air chamber approximately one kilometre of waterfilled passageway from the entrance lake. All equipment used on the push dive had to be carted from the surface to the entrance lake, some 90 metres below, assembled, carried by divers to the rockpile, taken apart, carried over the rockpile (a 20 metre high, 60 metre long pile of very loose rocks!) and re-assembled in the lake on the far side of the rockpile again.

From this point the push divers followed the guideline left by previous expeditions for 2 kilometres, before breaking new ground. Another 550 metres of submerged passage was explored before a lake leading to a new air chamber approximately 500 metres long was discovered. The new air chamber was christened Toad Hall before the divers commenced the return leg of a trip that took a total of 16 hours and in which each diver swam over 7 kilometres and breathed 21kg of compressed air!

To many people the vast arid Nullarbor Plain may seem an unlikely place for a major diving expedition. However, caves are found in the southern regions of this limestone plateau, many with huge passageways and caverns. Several are deep enough to reach the water table some 80 to 90 metres below the semi-desert surface. The first cave diving attempts on the Nullarbor were made in 1972 in Cocklebidly and Weebubbie caves. Since this time at least eight of the major caves have been dived, and many kilometres of spectacular underwater passageways discovered. As cave diving equipment and techniques improved, divers pushed further and further into the Nullarbor cave sumps. One cave in particular became the focus of attention. Five major trips to Cocklebidly cave between 1972 and 1979 saw divers discover 3 kilometres of passageway, all but 300 of which was fully submerged. The logistics and expense of this type of dive exploration delayed the next attempt until September 1982, when a West Australian team lead by Hugh Morrison assembled at Cocklebidly. The team included New Zealand and South Australian divers.

Access to the underground lake in Cocklebidly is through a large cavern, the floor of which drops 90m vertically over a horizontal distance of little more than 200m. The task of moving equipment down to the lake began on Sunday, fifth of September, and during the next two days more than forty 2500 cubic litre aluminium scuba tanks, a dozen sets of personal diving gear, torches, regulators, food, photographic equipment and even an emergency oxygen cylinder were hauled over the difficult terrain to the lake's edge. 240 volt electricity was run from a surface generator to the lakeside for lighting. 100 m of high pressure copper tubing was connected from a surface compressor down the initial and steepest part of the cave to the lake's edge. Scuba tanks could then be filled without having to be hauled all the way out to the surface. Communication from the surface to the air filling station in the cave was via a two-way intercom system.

On Monday sixth, a "fixed" guideline of 3mm diameter polypropylene cord was run from the entrance lake through to the Rockpile (see map); a 900m dive in which the roof of the passageway reaches a maximum depth of 10m below the water level. With the large numbers of divers due to pass along this first section of the cave, a good reliable guideline was essential. Previously laid guidelines were subsequently removed because they were unreliable. Silt can be stirred up in the first part of the tunnel and visibility reduced from perfect to less than 10m during the week of operations! The guideline also enabled divers to take the shortest route through the large underwater caverns whilst remaining at a relatively constant depth. (In places the passageway is up to 30m wide and 10m deep).

The Rockpile was first discovered in 1976 where the roof of the underwater cave has collapsed, forming a short section of dry passageway. Steep 20m climbs at either end lead down to the waters edge. All sumped off rockpiles are very unstable because of the lack of air movement and weathering. Divers have to be very careful - a minor injury can prevent a return dive. The Rockpile is treated as first base for push dive attempts in Cocklebidly. All equipment to be used on a push dive must be hauled along the initial 900m dive, disassembled, carted over the Rockpile, and reassembled in the lake on the far side. Tuesday seventh saw the major movement of equipment for the push dive from the entrance lake to the Rockpile. A team of three divers wearing triple 2500 cu.l.r. tanks on their backs, and supported by numerous other divers, pushed an underwater sled comprising of fifteen 2500 cu.l.r. tanks out to the Rockpile. Here it was taken apart and together with each tank, was carried over the Rockpile, and rebuilt in the lake on the far side. Sets of triple tanks (for the push divers to wear on their backs), the oxygen cylinder, various containers of food and spare parts were also transported over the Rockpile.

A certain tardiness on the morning of Wednesday September eighth possibly indicated the apprehension with which many of the party viewed the task ahead. From a group of five potential push divers (Hugh Morrison, Simon Jones, Keith Dekkers, Ron Allum and Peter Rogers), the three who felt fittest and most ready to go on the day were chosen. These were Morrison, Allum and Rogers.

The party comprised the three push divers, four back-up divers (who would assist at the Rockpile and await the push divers return) and nearly everyone else involved in the expedition. They left the surface at 3.15 p.m., to make their way down to the entrance lake. After a leisurely and relaxed dive to the Rockpile, the push divers assembled their equipment on the far side and were ready to leave about 8 p.m.

The dive plan was for the three push divers to swim the sled along another guideline left by

previous expeditions until one diver had used a third of the air supply contained in his five tanks on the sled. During this phase, the tripple tanks act as an emergency supply. Divers would then park the sled and continue on, now using air from the triple tanks on their backs. When one diver had used a third of this air, all divers would then turn around and start for home. In the 1979 expedition, Morrison, Jones and Dekkers had pushed 2km from the Rockpile. At this point the tunnel appeared to be deepening and showed no signs of stopping. This increasing depth below surface level meant that decompression problems could arise if a new air chamber was discovered further along the tunnel. Divers might then be forced to decompress before they could surface in the air chamber. This might not be possible on the limited air supplies available at the extreme range of such a dive. It was hoped to add at least 500m to the existing record. Triple 2050 cu. litre steel sets and sled had been used in 1979. This time, aluminium replaced the steel tanks and each was slightly overfilled to hold about 3200 cubic litres of air at about 27 mega-pascals.

So, with the prospect of a six hour dive ahead of them the push dive began. The four people waiting in the gloom at the Rockpile knew that the push divers had an absolute total of nine hours supply of air. Finding an air chamber might not extend this time due to possible decompression problems.

The first 500m were by far the most eventful of the whole dive. Buoyancy control of the sled proved more difficult than anticipated. Sled and divers careered from roof to floor on more than one occasion. Buoyancy was controlled by three scuba diver life vests attached to the front, middle and back of the sled. Each was fed from tanks on the sled. It was necessary to compensate for the estimated 30 kilogram of air that would be consumed during the dive. Also because air filled life vests were present on the otherwise constant volume sled, depth changes, which varied from 0 to 14m during the dive, caused buoyancy changes and these required constant attention. Other excitement during the first 500m of the dive included a blown high pressure hose on one of Morrison's regulators and an extruded o-ring from the first stage attachment of a scuba feed line on one of Roger's regulators. These problems were subsequently put down to the over-pressurized tanks. A regulator from a tank on the sled was used to replace Morrison's regulator, while the extruded o-ring on one of Roger's regulators was successfully replaced. Both these operations took place underwater! Keith Dekkers and Graham Morrison from the back-up diver team followed the push divers for the first few hundred metres of the dive using twin tanks. When these two turned back the silent immensity of Cocklebidy slowly enveloped the three push divers.

With buoyancy now under control the divers slowly pushed the sled through the crystal clear waters of Cocklebidy, following the line laid down by previous expeditions. The history of previous push dives came to light at a point 1 km from the Rockpile. A slate, left by Morrison and Jones in 1977 to mark the limits of their dive was discovered. Here the divers took a 5 minute rest, floating gently on the underside of the roof. Around 1650m from the Rockpile a 500m coil of guide line was found. It was left in 1979 by a South Australian push dive that had failed to break new ground. At the 1800m mark Hugh Morrison indicated that he had used a third of his air from the sled. As arranged, the sled was "parked" against the roof and the divers moved on into the clear waters ahead. 200m after leaving the sled, the guideline which had been a constant companion for 2 km., ended. A new record was being established, and the thrill of breaking new ground was experienced. Morrison tied on a new guideline to the end of the old, and the divers continued. About 100m further a side tunnel off to the left was discovered. This was the first branch in the entire length of Cocklebidy. A smaller second such branch was discovered at the 2250m mark, and it was with great expectation that the divers realised the form of the main tunnel was changing. From the 2km mark, at 14m roof depth, Cocklebidy gets steadily shallower, with a more uneven floor and has the two previously mentioned side tunnels. At the 2400m mark an air pocket was discovered, but after some brief underwater signalling it was decided to push on. By this stage the cave was only 3 to 5m deep, and showing every sign of surfacing. 2550m from the Rockpile, with a large air chamber above them, the divers were unable to continue underwater due to a collapsed rockfall. After a 5 minute wait, in deference for decompression sickness, they surfaced into a large chamber with a rockpile leading up out of it. Diving equipment was left at the waters edge and exploration of the new cave started. After an initial steep 15 to 25m climb the rockpile levelled off and the cave continued above the water in much the same fashion as it had underneath. After about 500m, Toad Hall (as it was named) ended in yet another lake, and cocklebidy headed off once more into the unknown.

The three divers rested for about an hour in Toad Hall before commencing the return journey, anxious not to stay too long for fear of unduly worrying those waiting at the first Rockpile. The outward dive from the Rockpile had taken 3½ hours, and so it was well after midnight by the time

the return journey commenced. On arriving back at the sled the divers paused to drink a fruit box apiece, to counter both the drying effects of the compressed air they had been breathing and the effects of decompression before getting underway on the slow return journey. Having mastered the buoyancy problems on the outward journey, the divers returned from Toad Hall to the Rockpile in $2\frac{3}{4}$ hours, a total push dive time of 7 hours. By this time fatigue, both mental and physical, was becoming an appreciable problem. The push divers and backup divers left most of the equipment at the Rockpile for retrieval the next day and headed for the entrance.

The party finally emerged tired but triumphant at 6.30 a.m. the next morning and huddled around campfire in the cold splendour of a Nullarbor dawn. The whole journey had taken over 15 hours, and each push diver had swum 7 kilometres. Despite these incredible statistics, the memory that lingered was one of the magnificent size and splendid stillness of an underwater world that began to fade from reality with the approaching dawn.

DISCUSSION

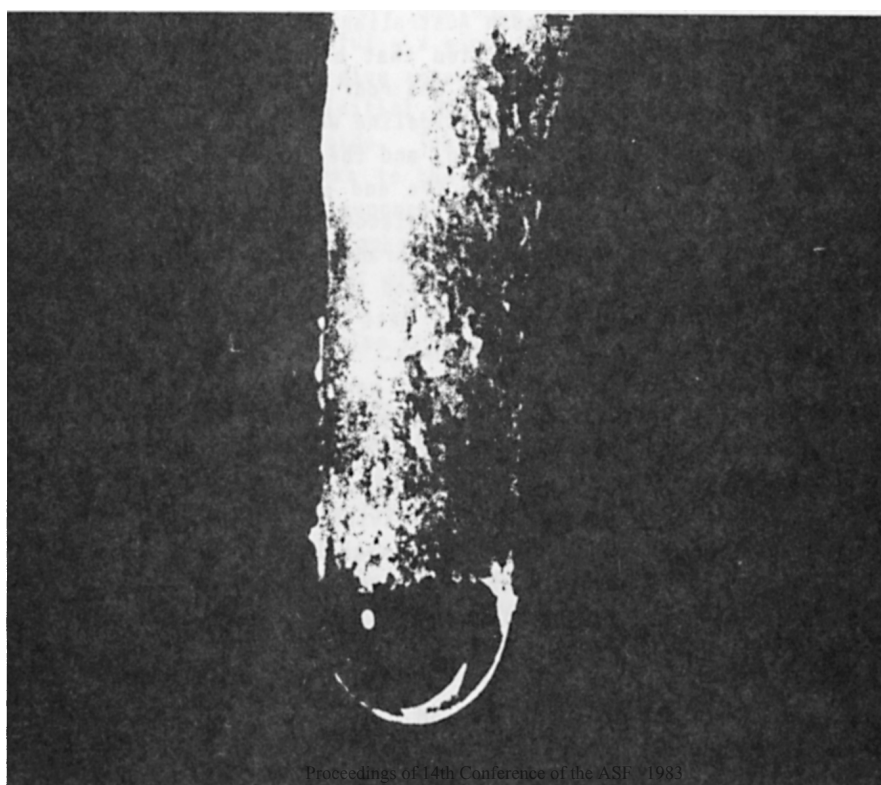
There is a warmer less dense slightly moving upper water layer a few degrees celsius high than the lower. Silt drops out of the top layer within a few weeks of dispersal but stays in the lower for much longer. This creates spectacular effects - it feels like you are swimming over clouds. Much further in the cave away from silt the thermo cline refracts light along it creating a sharp bright band around the walls.

The only effective cure for cold is exercise which means that everyone is both tired and cold at the end of the dive.

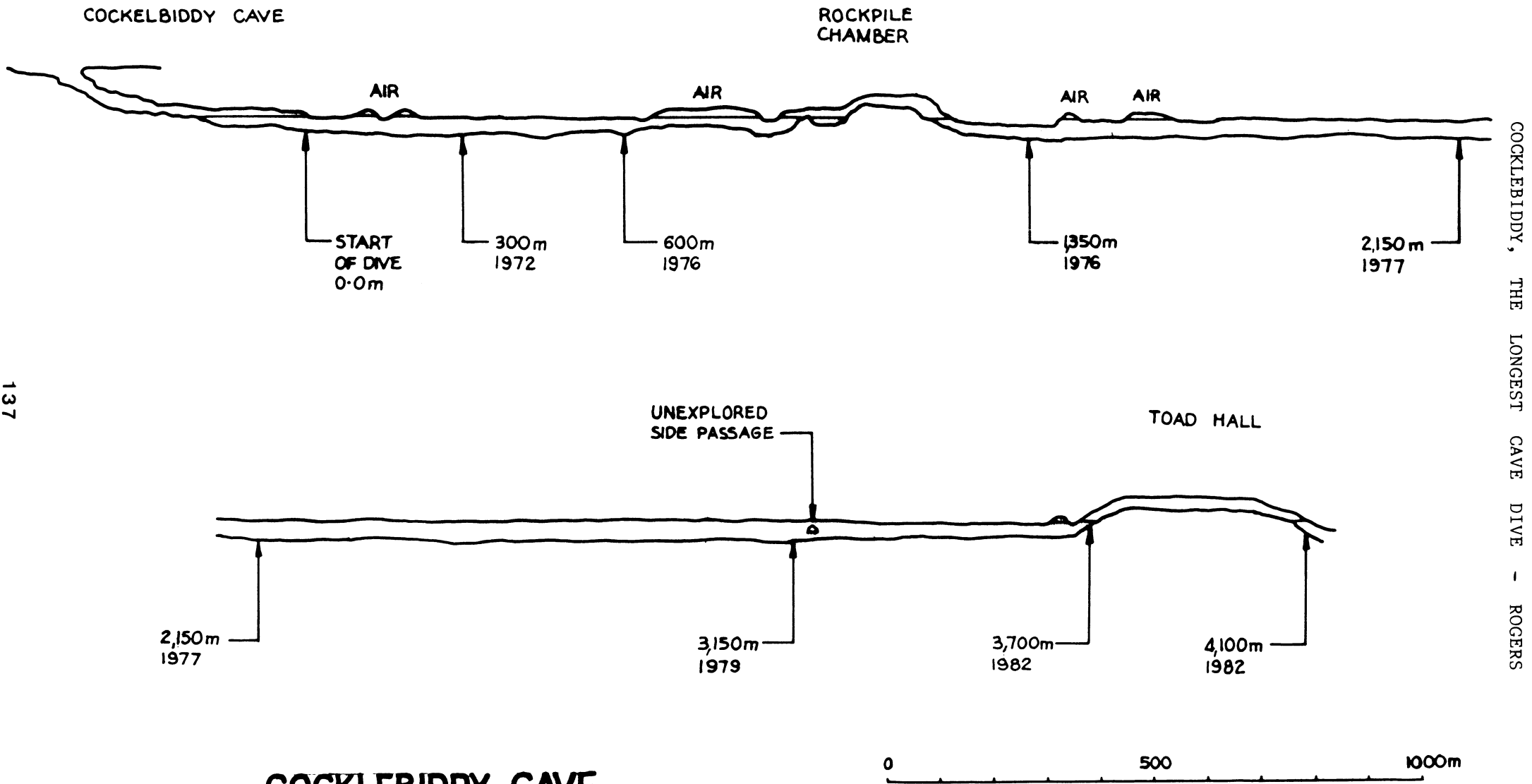
THE WORLD'S SHORTEST CAVE DIVE

by

Neil Hallet



Proceedings of 14th Conference of the ASF - 1983



COCKLEBIDDY, THE LONGEST CAVE DIVE - ROGERS

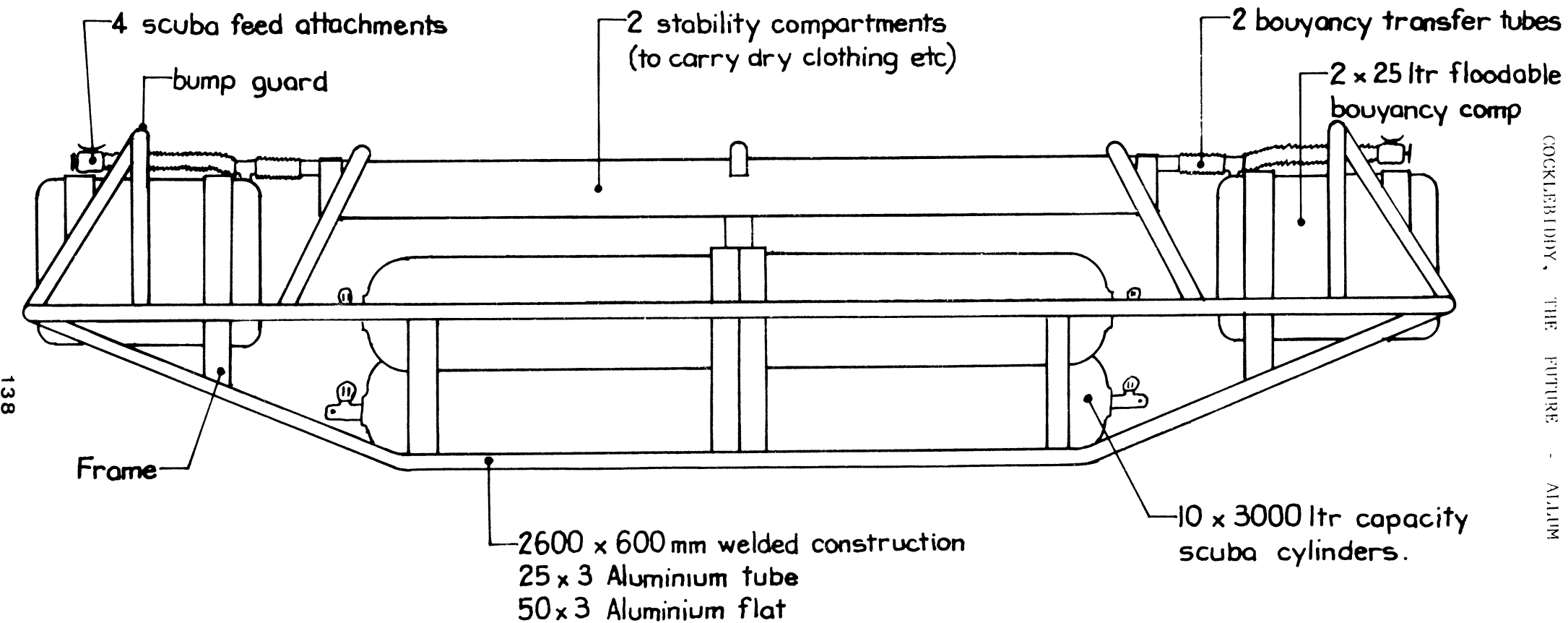
COCKLEBIDDY CAVE

NULLARBOR PLAINS - WESTERN AUSTRALIA

DRAWN BY - ROBYN ALLUM 1982

Proceedings of the 4th Conference of the IASG 1983

137



UNDERWATER SLED - Figure 6