

An Interview with Jochen Hasenmayer

This recording was originally conducted over the phone for an Icelandic radio documentary made by Jan Murtooma. The questions were formulated by Jan in English, and translated and presented by Hjálmar Sveinsson. The English transcript was kindly created by Chris Snuggs.

Interviewer: Herr Hasenmayer, how old were you when you first went caving?

Hasenmayer: That was in 1957, so I was 15 at the time. And at the age of 17 in 1959 I dived in my first cave and surfaced inside a mountain where no human had ever set foot before - I was the first to have ever shed a light in this darkness ... and that was the beginning of my fascination with the exploration of the underground world.

Interviewer: Can you describe the feeling you have when you are alone in the cramped and dark space that you find inside a flooded cave?

Hasenmayer: If I had feelings as such, then that would be dangerous, for the principal feeling of being alone in such a situation with so little experience would be fear, and fear is at the origin of all mortal caving incidents. Basically, it is only the unknown that one fears, so my first task was to learn about the possible dangers and how to equip myself properly so as to prepare for and guard against them. Then in 1967 I registered my first patent. That was for the first dry suit for cavers because the water is so cold. A number of other patents followed, and that with these numerous technical tricks I was able to – as it were - eliminate the element of fear, since I know exactly what to expect and have confidence in my equipment and preparation: that I have the technical means that I need to overcome them.

Interviewer: You and Sheck Exley are the most famous cavers in the world. Your greatest exploit was in 1981 when you went down the Fontaine de Vaucluse and thereby broke two records: firstly the record of the professional French caver, Claude Toulmergene diving deeper in the world's deepest pothole than anyone had previously gone and secondly also a new world record in deep-cave diving. The 1955 record of Jacques Cousteau was 74 metres, and you went almost three times as deep. The stress you must have felt before this challenge was no doubt very great. How does one prepare oneself for such an exploit?

Hasenmayer: The answer is similar to the one I gave before, since there must in fact be NO stress. Everything must be so well prepared from a technical point of view that everything goes according to plan. For this deep dive I constructed some new equipment, and in particular something I carried on my back consisted of four individual pieces of kit which weighed together 150kg. I also used four new different types of gas: oxygen of course, but very little, nitrogen - the second main component of normal air - again in small quantity, then a large quantity of helium and finally a fourth gas which I have not yet made public. This setup enabled me to prevent any risk of nitrogen narcosis so that I could think at great depth with complete clarity, just like on the surface. And the second problem is that when one dives deep a large quantity of gas is absorbed by the blood and when one surfaces the gas expands and one suffers from embolisms. That can be very dangerous and one needs to be very knowledgeable and careful about the decompression procedures put into place. At that time (1980) I began using my first computer and wrote my first programme to calculate my needs for deep-diving with such an exotic combination of gases.

And with these technical means at my disposal I went down to new depths, but my intention was not to set new records. What happened was that I went deeper than the level of the Mediterranean sea-bed. In fact, I went under the seabed and found the water was still fresh. In other words, I discovered through this deep dive a large quantity of freshwater reserves which are under the seabed at the edge of the ocean. That was in fact my goal: to go deeper, further and for longer into this unknown world and make new geological and resource discoveries.

Interviewer: In 1980 you explored the Imergenz de Landernuz and used for the first time in a deep dive a home-made breathing-apparatus. A few weeks later you dived in the Imergenz de Ressel and broke yet another world record. Few people realized at the time the importance of this diving technique. You had a table of diving data which you designed yourself - what did you think when you went over 80m? Where did you find the information? How did you come by the knowledge that enabled you to build such a breathing apparatus?

Hasenmayer: Well, from my earliest caving days I had been designing and building new kinds of diving equipment. I am an engineer by profession and it has been my technical advantage that has allowed me to dive ever deeper, further and longer in more demanding environments than other cave-divers. This blood-circulation machine represented a great leap forward. It is a “double-circulation” machine, in other words two separate units - the first of its kind built for caving

One breathes normal air out, which is cleaned by CO₂ and then a little oxygen is added so that it can be reused. Thereby one needs very little air and so can remain for a long time under water. Until then I could - using the equipment available until then - I could stay under water for several hours depending on the depth (the deeper the shorter), but with the new “double-circulation” equipment I was able to stay up to 48 hours underwater irrespective of the depth. The small quantity of air I had was always sufficient because it was constantly recycled.

These various records in fact correspond with milestones in the new scientific and geological discoveries that I made at these unexplored depths. And this dive at the L'émergence du Ressel Ressel proved that there are caverns with vast reserves of fresh water to be found under the sea bed.

Interviewer: What led you to build the so-called Speleonaut?

Hasenmayer: The term Speleonaut derives from “Speleo” meaning “cave” and “naut” meaning “sailor”, so “Cavecraft”. “Höhlenfahrer” is the name of this craft, which was the first submarine which can function in underwater channels. In other words, a submarine which can enter a cave system and re-emerge whatever mechanical mishap might occur. Previously it was of course quite easy to enter an underground water system but when you got a kilometre or two into it and an engine failed or the propeller got tangled in a line then you would never get out.

Therefore, a submarine for caving exploration must be designed so that all components which could fail must be built into the submarine in triplicate. Such a submarine had never before been built because of course it has to negotiate very narrow channels. So, this triple-component technology must be built into the smallest possible space. It was the first “international” caving submarine, and I actually built it as a result of an accident - a diving accident, not in a cave but during the making of a film in the Wolfgangsee in Austria. There was a mishap in my decompression procedure which left me paraplegic and confined to a wheelchair. However, with the building of this first specialist caving submarine I

was able once again to go cave-diving, or more precisely cave-travelling. It was so to say the beginning of the navigation of the underground world. So, I built this craft and thus discovered new caves and also very important proof that in Southern Germany there are giant underground hot-water resources - rather like in your country, Iceland, but not due to any geothermal anomaly but a completely normal geological phenomenon as can be found all over the planet. These channels run up to 5 km under the surface and form the biggest reserves of energy in Southern Germany, enough to heat your home for a thousand years. So, it was by building this Speleonaut that I was able to make these discoveries.

Interviewer: The possibility of death is a constant companion of the cave-diver. How do you feel about that?

Hasenmayer: In a way I have already explained that. Basically, death must not play a part in the diver's thoughts, since otherwise it would indicate that all necessary precautions had not been taken. I was the first to dive with this specialized breathing apparatus - along with two dry diving-suits, one inside the other - and the first to build the air-recycling device I described above. All of this was designed to make deep cave-diving in a life-threatening environment safe, to create a situation in which one has sufficient time to do research in unknown environments. Thoughts of death don't really come into it, since the submarine we built excludes all dangers that we could possibly anticipate. Previously, deep-diving of this nature was really very dangerous, up to 130 times as dangerous - or 130 times as many deaths - as diving in the sea. Cave-diving is not a battle with death; it is a matter of research; a dream of Mankind to penetrate into an unknown world and dive weightlessly in the darkness and to see in these underground caves and channels things that no other human has ever seen.

Interviewer: May I ... have you ever been to Iceland Herr Hasenmayer?

Hasenmayer: Unfortunately no, though as far as geothermal phenomena are concerned I find it very interesting.

Interviewer: Yes indeed, and there are caves underneath a glacier in a geo-thermal area - a large cave-system.

Hasenmayer: And there is a volcano under the glacier, no?

Interviewer: Yes

Hasenmayer: ... and the hot water has flushed out the water channels. That is very interesting. Iceland would be very interesting - but a bit tricky in my wheelchair, and launching the submarine there would not be possible.

Interviewer: Many thanks