The Dolphin Man – the phenomenon of Jacques Mayol

This nostalgic enthusiasm for technology is in the nature of things, because the history of diving is first and foremost a history of technical and scientific progress. However, this fixation makes it easy to lose sight of one form of diving, the most natural and oldest of all: diving only with breath held. I would like to remind you here of this most primal way of being underwater, or more precisely, of a special form of it. To do this, I am turning back the clock by half a century and taking the reader on a small ship in the Mediterranean for a day. But my report is above all a tribute to the man who shaped apnoea deep diving or freediving in a decisive phase like no other: the Frenchman Jacques Mayol.

Born in Shanghai in 1927, Jacques got to know the sea at an early age, was able to observe Japanese ama divers at length and spend hours swimming with dolphins. These marine mammals grew particularly close to his heart and his love of the sea characterised his entire life.

Fig. 1: The Elbano primo, the floating base for Jacques' training. Photo: Michael Kranzler

Pareti on Elba, shortly before eight o'clock in the morning. On the Elbanoprimo, a converted navy boat (Fig. 1), the crew prepares everything for departure (Fig. 2). When Jacques comes on board, we cast off. He begins to carefully check his equipment (Fig. 3). At around 10 o'clock we are half a nautical mile south of the small Gemini Islands (Fig. 4), and everything is ready. A small platform hangs on the port side at waterline level, with a stable rope guide next to it. Mayol sits on the platform in a wetsuit, his feet in the water (Fig. 5). With his eyes closed, he breathes evenly and with concentration. Silence all around. One last deep breath and he glides into the water (Fig. 6).

Fig. 2: The crew prepares the equipment with practised hand movements. Photo: Michael Kranzler

Fig. 3: Jacques always checks his equipment personally. Photo: Michael Kranzler

Fig. 4: The training area lies south of the small Gemini Islands. Photo: Michael Kranzler

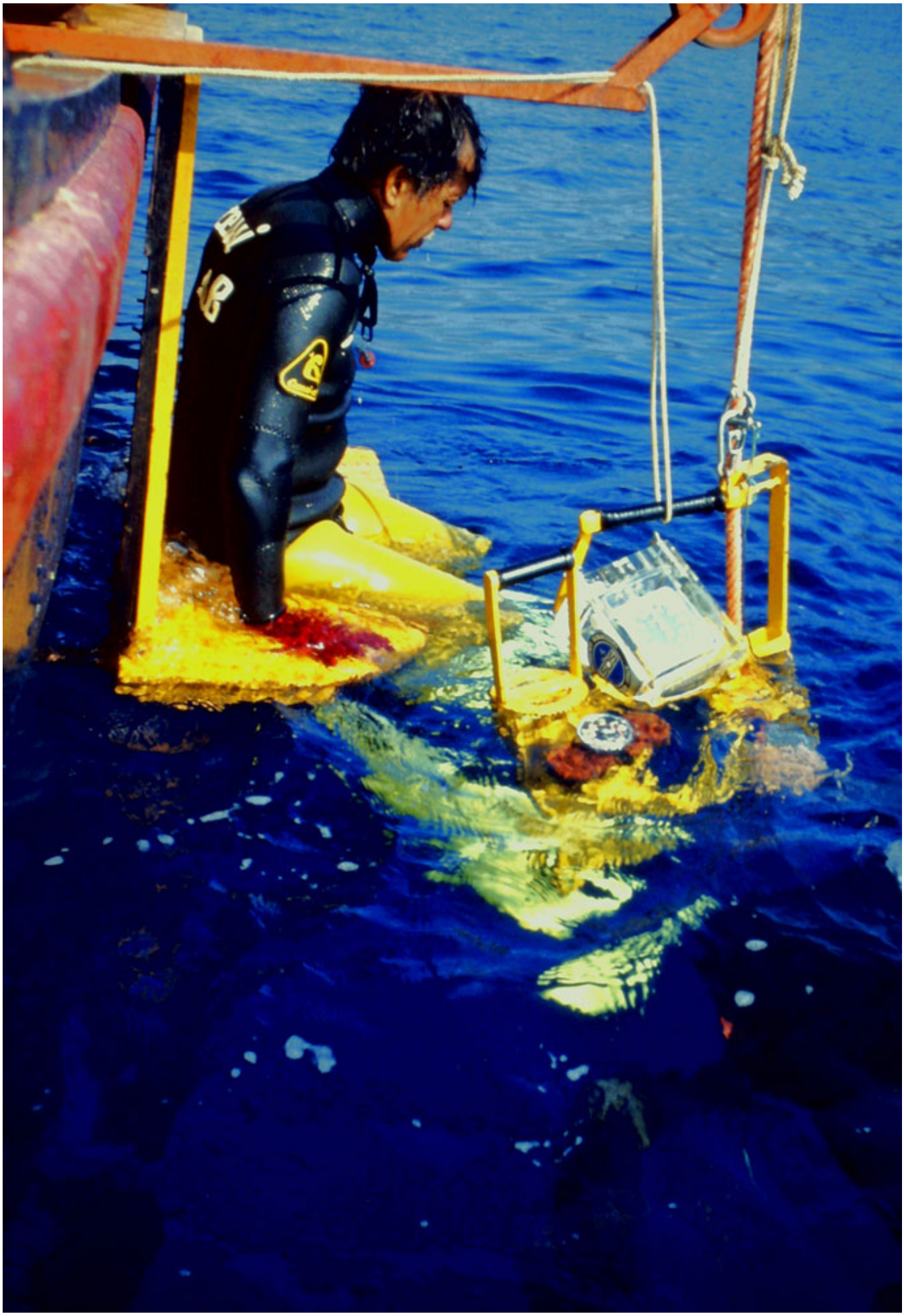

Fig. 5: Jacques always starts from a small platform. Photo: Michael Kranzler

Fig. 6: He takes his fast deep breath through his mouth. Photo: Michael Kranzler

Gradually, the yellow shimmer of his fins and trousers melts into the rich blue of the depths. We stare mesmerised at our stopwatches. The second hand advances agonisingly slowly. More than three minutes pass before the diver breaks the surface again (Fig. 7). Nothing special for Jacques, a training descent to a depth of 'only' 45 metres. Without any signs of shortness of breath or even exhaustion, he clings to the platform and chats in a relaxed manner (Fig. 8). He then climbs on deck and stretches out on the planks to prepare for the next descent (Fig. 9). Mayol regularly starts his training with 'shallow' depths, which he then gradually increases depending on his form on the day. Even during these 'warm-up descents' he remains under water for longer than 3 minutes, observing and controlling his body without fully utilising his capacity. At rest, he can suppress the breathing reflex for around seven minutes. Mayol has been setting spectacular records again and again since 1966 (Bahamas, 60 metres).

Fig. 7: When Jacques resurfaces, he shows no signs of shortness of breath. Photo: Michael Kranzler

Fig. 8: Small talk immediately after surfacing. Photo: Michael Kranzler

Fig. 9: Deeply relaxed rest before the next descent. Photo: Michael Kranzler

But how could a human beeing reach such depths with just holding its breath? We all still have the theorems hammered into our heads during our diving training: At the latest, when the water pressure compresses the air volume in the lungs to the size of the residual volume of 1.5 litres, it's over. This means a depth of between 30 and 40 metres, depending on your vital capacity. Diving any deeper means pulmonary oedema and overstretching of the heart muscle. We remember another deadly danger that does not lurk at depth, but strikes insidiously on the way back just below the surface: After spending time at depth, the partial pressure of oxygen drops rapidly on surfacing. Possible consequences: acute hypoxia, black-out, death. That was the credo of all diving physicians at the time, and it was written in all textbooks.

And then suddenly this Jacques Mayol came along and dived twice as deep. That was exactly what was meant by the 'decisive phase of freediving'. Mayol took physical laws and medical principles, which were considered irrefutable, ad absurdum. To put it succinctly: Boyle-Mariotte, Dalton, Henry and Gay-Lussac are dead; long live Mayol!

Jacques prepares for the next descent with yoga on the aft deck (Fig. 10). In the 1960s, he travelled to India especially to learn the breathing technique and physical exercises of pranayama yoga. Jacques doesn't just use yoga only to improve his breathing technique. Rather, it forms the core of his training and his entire philosophy of life. Yoga not only means unity of body and mind, but also unity of the individual with all of life, indeed with the entire universe. Man becomes part of nature. This is how Mayol described his world view in an interview with a diving magazine. He also told the magazine that yoga should be a fundamental part of diving training.Yoga is also the origin of his deep, almost sensual love of the sea. I am convinced that from the moment he dives in, Jacques does not feel like an intruder in a foreign world, but a natural part of the sea. This unity with the sea, this close connection, also spurs him on to work for its protection.

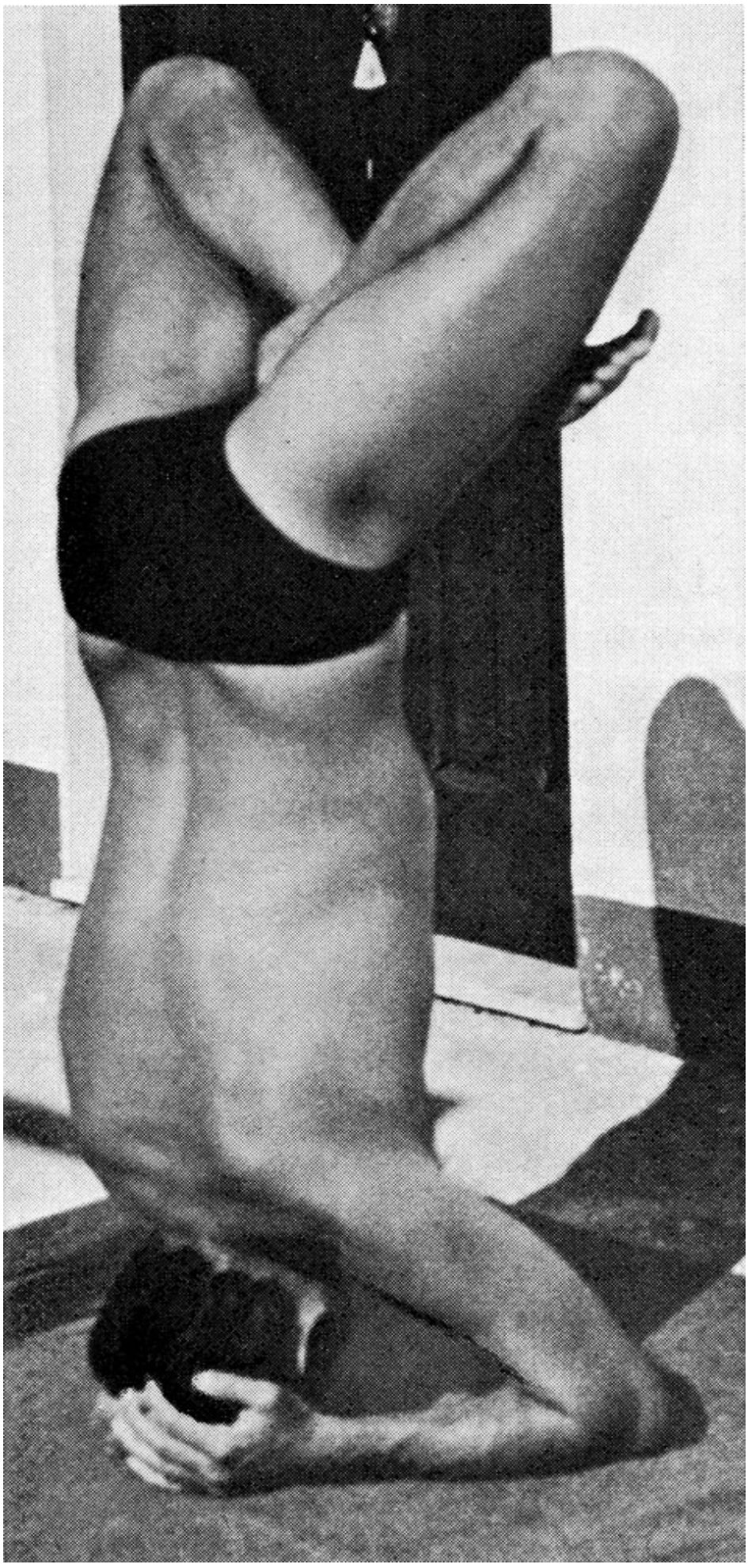

Fig. 10: Yoga forms the centre-piece of his training. Photo: Submarin No. 12/1977

We set up the equipment again (Fig. 11). Alfredo, the captain, personally checks the chronometer, which is enclosed in a thick perspex case, and checks all the fastenings. The chronometer and a precise depth gauge are attached to the sled so that Jacques can keep a constant eye on them while gliding downwards. Further down is a small compressed air cylinder with a lifting balloon. The sledge, which weighs around 30 kg, whizzes along a thick guide rope and pulls the diver down into the depths. Jacques can regulate his sinking speed with a friction brake and stop it completely if necessary. A deco line with depth markings hangs overboard from the ship. Next to it dangle three regulators connected by long hoses to a large oxygen cylinder on the foredeck. All divers carry two regulators on their equipment. But are these measures enough? Jacques' risk is no higher than for any normal diver, says his doctor. But how quickly could the safety divers bring Mayol up from the end of the rope in an emergency? How long would it take for professional medical help to arrive on the scene? They say that this is not a problem at all during training, and that everything is ready for the real record attempt. But what happens if the accompanying divers get into trouble themselves? After all, the sea here is more than 120 metres deep!

Fig. 11: Before each new attempt, all the equipment is checked. Photo: Michael Kranzler

Now Jacques is ready again (Fig. 12). His gaze appears fixed and expressionless due to the unusually thick contact lenses (almost 10 mm). These custom-made lenses and a nose clip save him the mask and the problems with dead space air. However, he has to be careful not to lose it in the passing water when descending. The rope is lowered to 60 metres. We accompanying divers are ready and fall backwards overboard, gather at the guide rope and wait. Jacques sits on the side of the boat and concentrates (Fig. 13), then slides down onto the platform. There he remains motionless, breathing carefully and deeply, but without hyperventilating. Alfredo crouches next to him, holding a cord in his right hand. He will use it to pull open the snap hook that holds the sled at the start. Mayol raises three fingers: 3 minutes to go. We dive down. I'm assigned to 25 metres. I wait there while the other safety divers sink deeper. I look up eagerly. I can clearly see Jacque's fins and feet in the clear water. Now he dives in, turns just below the surface and quickly sinks headfirst. He comes towards me evenly and quickly, gliding past me. Due to the pressure equalisation, he manages about one metre per second, a remarkable performance, especially in the first 10 metres. Again, it seems to me as if time stretches endlessly before a faint glimmer low down heralds his return. He rises slowly without any haste and moves his long fins only occasionally; mostly he shimmies playfully up the rope. He regularly stops briefly 1 metre below the surface to, as he says with a grin, prepare himself for the terrestrial dimension that awaits him above. Jacques has long since been on board when the bulging lifting balloon propels the sledge back up in a seething gush of bubbles. One by one, we also return. Jacques orders the rope to be lowered to 75 metres and does a headstand on the aft deck. Because of the swell, a helper holds his feet.

Fig. 12: Jacques is ready again and jokes with the crew. Photo: Michael Kranzler

Fig. 13: Then the concentration phase begins. Photo: Michael Kranzler

On some days, Mayol is accompanied by his charming 'personal coach' (Fig. 14). When he is taking a break, she also dives. She reaches depths of almost 40 metres (Fig. 15).

Fig. 14: Some days he is accompanied by his partner. Photo: Michael Kranzler

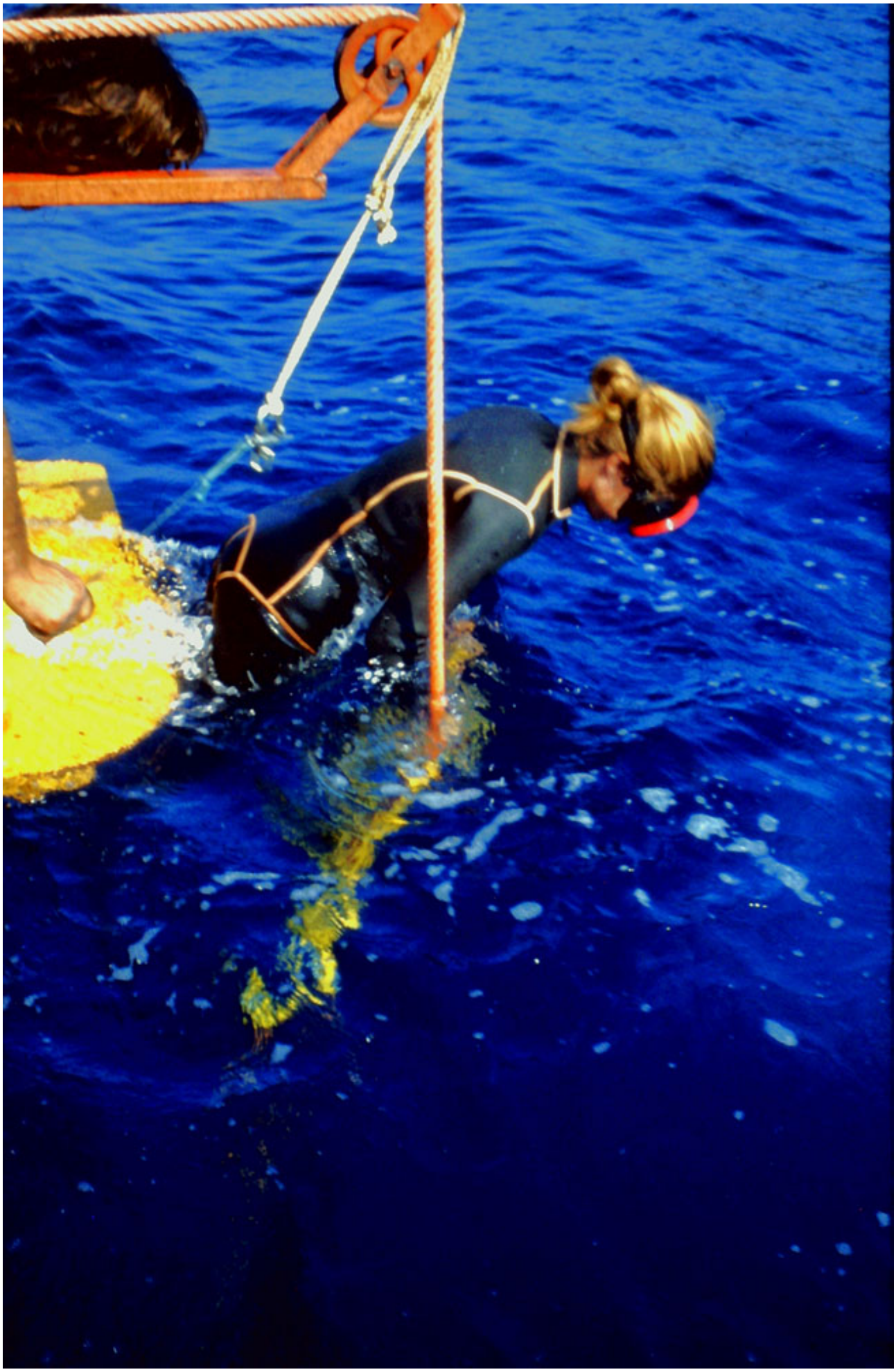

Fig. 15: She also freedives, but only as a hobby. Photo: Michael Kranzler

What drove Jacques to these unique achievements at the time? A need for recognition? A thirst for fame? Vanity? For those who knew him, these questions do not arise. Jacques' character was anything but exalted. Although he was always the centre of attention in the crew, he never played to the fore, remained rather reserved, was always friendly, had a wide range of interests and was always open to conversation – in short, an extremely likeable person. Was there perhaps insatiable sporting ambition behind this? He only regarded his records as sport at the beginning of his career. Jacques didn't care about winning laurels, at least since his fiercest rival, the Sicilian Enzo Maiorca, had dropped out of the competition and the CMAS no longer officially recognised the records. But Mayol simply wanted to find out whether he was capable of reaching the depth of 100 metres, and also how such records were even possible. To find out, he worked together with Italian physicians such as Ricci, Tiepolo and the young Alessandro Marroni (Fig. 16). Sandro, as all his acquaintances call him, founded the Divers Alert Network (DAN) in Europe in 1983. This international network of alert centres ensures the safety of divers around the clock. However, this organisation is not only active in emergencies, but also carries out prevention through education, training and research. Sandro is still CEO of DAN and an active diver. Back then, the doctors examined whether hypoxia, hypercapnia or acidosis occurred during Mayol's descents, monitored the pulse and the course of O_2 and CO_2 partial pressure and continuously checked the altered blood count. A special device enabled continuous ECG recordings down to a depth of 62 metres. The results clearly showed that Jacques was rightly nicknamed 'Dolphin Man' and 'The Amphibian'.

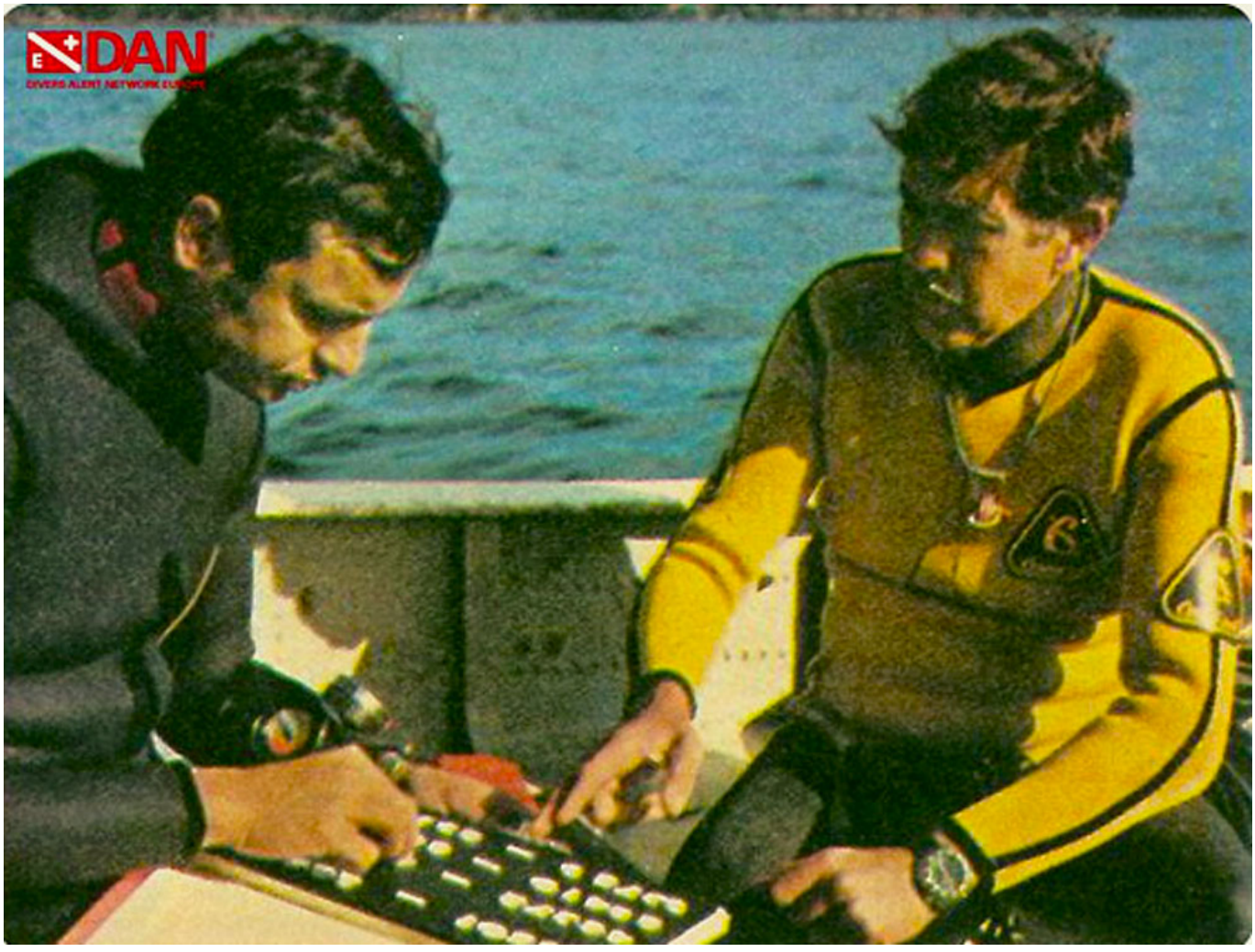

Fig. 16: Dr Alessandro Marroni (left) examines Mayol. Photo:DAN Staff

Because while the limbs were less well supplied with blood, the capillaries of the vital organs in the chest and the brain filled up with more blood (according to new research findings, this can be up to 1.5 litres). This phenomenon, known as a ‘blood shift’, increases the diastolic filling of the heart and thus the cardiac output. This in turn results in a dramatic drop in the pulse rate (bradycardia). At a depth of 86 metres, Jacques’ heart was beating only 28 times per minute (Fig. 17). Sandro assumed a conditioned reflex here, triggered by breath-holding. Apparently the reduced body weight and the cold water intensified this effect (Jacques never wore a hood).

Fig. 17: Sandro measures Jacques’ pulse rate at a depth of 86 metres. Photo: DAN Staff

His blood count also changed during the descents. Samples taken at various depths showed that Jacques’ blood was enriched with erythrocytes, which are normally stored in the spleen, when he dived. Jacques had spent several weeks in the Andes at altitudes of up to 4,000 metres so that his blood could produce more red blood cells. The proportion of thrombocytes also increased. The doctors surmised that Mayol’s body was actively involved in all of these changes, at least in part. His body therefore reacted very similarly to those of marine mammals and reptiles when he dived. If Jacques is not to be regarded as a unique curiosity, but merely as a particularly distinctive case, the human body can adapt much better to the conditions of free diving than had previously been assumed.

But does the depth perhaps affect the mind? To find out, Sandro tested Jacques’ coordination of mental abilities and motor skills using a pegboard (Fig. 18). The test subject has to insert various cylinders with different diameters into the appropriate openings of a board. The tests on the surface, at a depth of 50 metres and after surfacing showed ‘no significant differences’. Sandro admits that Mayol was a real exception.

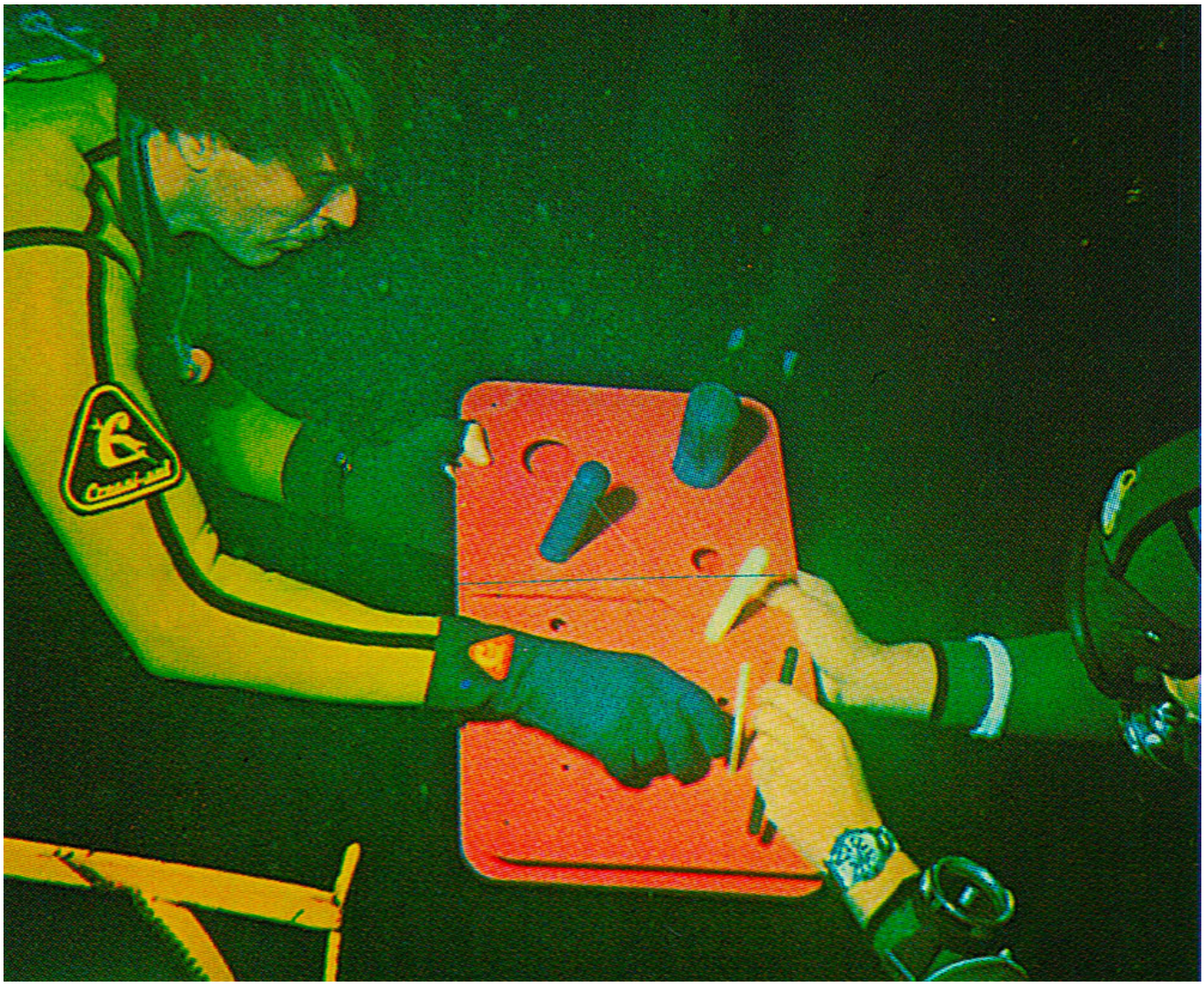

Fig. 18: Tests show that the depth does not affect Jacques'mental and motor skills. Photo: DAN Staff

Everyone is ready for the third descent (Fig. 19). We are already in the water and look expectantly at Jacques. Now he raises 4 fingers. We switch from snorkel to regulator and dive down following the rope. From a depth of 45 metres there are still two of us; at 60 metres I stop, while the other one continues to sink down to the stop disc, which I can only dimly see below me. Its bright orange colour looking dirty brown down here. Waiting. I feel uncomfortable and uneasy at this unfamiliar depth. Dim twilight all around, the cold creeps under my suit. Although I've barely been down here for two minutes, the wait is getting on my nerves. Finally, a blurred outline emerges from the bright water above me, taking on contours. What is happening before my eyes is unbelievable, unreal. At a depth far below the safety limit for divers who breathe compressed air, a man without a breathing apparatus rushes towards me, sinks past me on his sledge right down to the stop. There he calmly switches off the chronometer, shakes the safety diver's hand and begins the ascent with very light fin strokes.

Fig. 19: As Jacques prepares for the next descent, we are already in the water. Photo: Michael Kranzler

He pauses again and again, looks at his watch and comes up higher. Smiling, he waves to me and slowly drifts up into the brightness.

After the lifting balloon, we follow. We breathe oxygen at 6 metres and again at 3 metres. When we finally climb on board, Jacques is already swimming to the shore; it's his way of finishing off the daily training. The lines are hauled in and the equipment is stowed away. I think about the coming descents, not without worry; will Jacques reach his goal?

On 23 November 1976, Mayol was the first freediver to reach a depth of 101 m off the island of Elba and on 19 October 1983 – at the age of 56 – he even reached 105 m. In the same year, his biography 'Homo Delphinus – the dolphin within man' was published. Jacques became really popular again in 1988 with Luc Besson's film about him, 'The Big Blue'. But he felt increasingly lonely and gradually fell into depression, which then worsened dramatically. Shortly before Christmas 2001, he took his own life at his home in Capoliveri on the island of Elba. In accordance with his last will, his ashes were scattered in the sea. French President Jacques Chirac honoured Mayol as a 'visionary who will remain as a symbol of the search for the absolute.'

The sense or nonsense of extreme apnoea diving were already controversial at the time and they still are. For me, however, the days with the fascinating 'Dolphin Man' remain an unforgettable experience (Fig. 20).

Fig. 20: The encounter with the dolphin man remains an unforgettable experience. Photo: Michael Kranzler

Acknowledgements

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