

TECHNICALLY SPEAKING

TALKS ON TECHNICAL DIVING VOLUME 1:
GENESIS AND EXODUS

SIMON PRIDMORE

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For the writers, without whom so much would be lost to time

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PREFACE

My aim in writing this book was to examine and record where technical diving came from, how it developed, how it expanded across the world, who the important movers were and how the efforts of a few determined people changed our little field of human endeavour forever.

I decided to do this via a series of detailed, consistent and, I hope, entertaining talks, each covering a specific theme, picking out the various threads that combined and entwined with each other during the years preceding the emergence of technical diving in 1989 and following them through to the end of the 1990s, by which time technical diving had become part of the scuba mainstream.

The period I cover began with:

- Sport diving defined as open circuit dives on air to a maximum depth of 39m (130ft) with no required decompression stops.

- Gary Gentile's victory in a court case encouraging the devotees of extreme scuba diving to emerge out of the darkness at the outer limits of divers' awareness.
- The radical first issues of *aquaCORPS* magazine and the *Sub Aqua Journal*.
- Cathie Cush's jaw-dropping, eyebrow-raising *Sports Illustrated* article on diving the *Andrea Doria*.
- Tom Mount's purchase of a tiny training agency with big plans in mind.

It ended with:

- Nitrox and technical diver training as part of the sport diving mainstream.
- Sport divers safely accomplishing dives to 90m (300ft) using helium-based mixtures and multiple decompression mixes.
- Nitrox computers as standard tools for all divers.
- Affordable, closed-circuit mixed gas sport rebreathers.

The decade saw the greatest shake-up our sport has ever seen but technical diving's road to universal acceptance was anything but smooth, many obstacles had to be overcome and there were times when even viewed in retrospect, it seemed that its advocates would fail. Ultimately, success came down to perseverance, people power, good timing and more than a little luck.

The individuals named in this book were by no means the only ones involved in technical diving in what I have called the Genesis and Exodus era. The fact that someone is not mentioned here does not indicate that they were not part of it,

nor that what they did was insignificant. Technical diving spread widely, the participants were many, and I have been limited by space and time. If anyone feels aggrieved that they or others do not appear within these pages, or thinks I have got something wrong, please write to me directly so we can discuss it. Nothing is written in stone. I don't think I am omniscient, and I am always happy to fix any errors I have made.

Having said that, during my research I learned an important lesson. With any event, there can be several "true versions" and the more important the event, the more versions there are. Perspectives differ, memories fade and stories evolve over years of telling. Where possible, I have always followed contemporary documentary evidence, but sometimes even this is inconsistent. Where accounts differ, I have tried to remain balanced and even-handed, but the overriding aim has always been to keep the reader engaged. If this meant I sometimes had to smooth out wrinkles, bridge gaps or omit minor details and references to petty debates, then that is what I did.

Because each talk/chapter is self-contained and stands on its own there is some overlap, but I have chosen to leave the overlap in the text, rather than taking things out or using cross-references to make readers flick back and forth. Again, my priority was to keep things interesting and easy to follow.

I hope you enjoy this trip back in time.

Simon

February 2023

PART I

TALKS

GENTILE'S JUDGEMENT

HOW DEEP SPORT DIVERS WERE
ENCOURAGED TO COME BLINKING OUT OF
THE DARKNESS AND INTO THE LIGHT

Talk time: 20 minutes

The *USS Monitor* was launched in early 1862, at the height of the American Civil War. Less than a year later, she capsized in a storm off Cape Hatteras, North Carolina, with the loss of 16 crewmen. Yet, in her short lifetime, the *Monitor* attained stardom and on her demise, she became a legend.

She was the first American armoured warship—or ironclad—and she revolutionised naval warfare. For over a hundred years, she rested on the floor of the Atlantic Ocean undisturbed—upside down, as it turned out—her heavy turret and guns flipping her over as she sank.

The wreckage of the *Monitor* was discovered in 1973 at a depth of 67m (220ft) and, in 1975, the waters around it were declared a National Marine Sanctuary to protect the artefacts from salvage and exploitation.

In 1984, Gary Gentile, one of a community of expert scuba divers who were exploring the deep shipwrecks off the US northeast coast using innovative techniques, procedures and equipment, applied to the National Oceanic and Atmospheric Administration (NOAA), the federal agency appointed as guardian of the marine sanctuary, for a permit to make a dive on the wreck of the *Monitor*.

The application was turned down, as were 10 further applications Gentile was to make over the subsequent 5 years.

The reasons NOAA gave for rejecting the applications had nothing to do with the status of the site as a sanctuary. The rejections were based on safety grounds, with NOAA citing as justification for its refusal the fact that Gentile and his colleagues would be contravening its standards and limits, which were very similar to those of all major sport diving training agencies at the time. The wreck was too deep for sport divers to dive it safely, it said.

A first appeal seeking to have the NOAA decision reversed failed in a district court.

So, in October 1989, Gentile appealed again.

The grounds for his second appeal were:

- NOAA's standards were out of date.
- Gentile and others had the skills, technology and proven procedures for diving to such depths safely.
- It was wrong to define them simply as sport divers.
- NOAA was being vindictive and had a hidden agenda.

The judge hearing the second appeal agreed. He wrote:

“The NOAA and/or U.S. diving standards against which Mr Gentile’s permit applications were judged are antiquated, in violation of NOAA’s own diving regulations, and in contravention of the standards accepted and administered by other federal agencies in that they fail to adequately account for recent technological and procedural innovations which have proven to minimize the safety risks of deep diving on scuba equipment by the permit applicant.

Mr Gentile and the other divers whose scuba diving vitae were made a part of the applications were wrongfully and improperly classified and judged against a sport or novice diver standard.

The administrative officials who participated in the permit denial process were non-disinterested, bore a personal antipathy toward Mr Gentile, and had ulterior and capricious motives for denying the applicant access to the Monitor Marine Sanctuary.”

Detailed discussion

As part of his judgement, the judge addressed the issue of NOAA’s agenda. He acknowledged that a substantial degree of acrimony had arisen between Gentile and NOAA over the years, mainly as a consequence of various delays that NOAA had inserted into the process. He also noted that what he termed as Gentile’s “belligerence” had not helped smooth the way.

He went on to say:

“Antagonism and reprehensible behaviour does not warrant official recrimination or sanctions. The failure to act or issue

an opinion on the appellant's requests by the diving office of NOAA for over a year when there was "not a hell of a lot of thinking" involved in reaching the adverse determination, demonstrates a very unfortunate attitude and mindset on the part of the NOAA officials. Five-minute determinations simply should not take over a year. Nor should citizens be led on with suggestions or requests for changes, which will not alter the initial decision."

This first slap on the wrist for NOAA was immediately followed by a second. The judge recounted an episode during the case when he had questioned a NOAA witness, whom he described as "reluctant", about previous diving activity on the *Monitor* and elicited a previously undeclared revelation that, in 1979, Jacques Cousteau and the Cousteau Society had been granted a permit to dive the wreck.

Not only had this information been withheld from Gentile and the previous district tribunal, but it transpired that Cousteau's request had been very similar to Gentile's. Nevertheless, the Cousteau team's request had been granted by NOAA within 30 days of its receipt, without even consulting its own diving office, which was the bureau that kept turning down Gentile's applications.

The judge described NOAA's earlier omission of these pertinent facts as demonstrating a "lack of candour". He found that the evidence presented by Gentile and his witnesses—who included prominent members of the deep diving community such as Hal Watts and Billy Deans from Florida and Steve Bielanda from New York—was credible and consistent. He concluded:

"Diving presents elements of danger. The risk increases below 130 feet. The Agency (NOAA) witnesses cited standards that

the Agency has adopted for the conduct of its diving activities.

Staged decompression divers, including the appellant (Gentile), sometimes penetrate to depths below 200 feet. This is well beyond the NOAA, Navy and OSHA (Occupational Safety and Health Administration) standards. It appears that a significant number of trained scuba divers frequently penetrate to depths at and in excess of 200 feet. There is certainly an element of increased risk, but not to the extent that restrictions on personal activity can be justified.”

The judge then expanded on what he meant by this last sentence.

“The Agency (NOAA) witnesses, most of whom are themselves scuba divers, do not venture to such depths. However, they probably don't smoke, ride motorcycles, parachute, hang glide, scale mountain peaks, skydive, spelunk, drive speed boats, fish commercially, or engage in other such activities permitted in society.

In retrospect, many would say it was foolhardy for the past Secretary of Commerce to be involved in a rodeo-type activity, being over three score years in age. There has been no attempt to impose an OSHA or other federal agency standard for such riding activity, fatal though it was.”

Here, the judge was referring to US Commerce Secretary Malcolm Baldrige Jnr, who, in 1987 at the age of 64, had been killed in a rodeo accident.

He went on to compare Baldrige to one of the deep-diving witnesses that Gentile had called.

“Similarly, the staged decompression diving of Ms Connell, who is approaching three score years, is the mother of 11 and grandmother of 10, is not an activity to be proscribed by bureaucratic fiat.”

Then he closed this part of his judgement with a pertinent quotation from the 1980 Idaho Law review.

“A venturesome minority will always be eager to get off on their own, and no obstacles should be placed in their path; let them take risks, for God’s sake, let them get lost, sunburnt, stranded, drowned, eaten by bears, buried alive under avalanches - that is the right and privilege of any free American.”

In the next section, the judge started picking apart NOAA’s claim that Gentile’s proposal was dangerous and highlighted NOAA’s hypocrisy in holding Gentile and his team to entirely different standards from those to which it had held the Cousteau Society. He observed that:

“The agency’s repeated denials of the appellant’s requests for permits have been principally based upon the safety concerns issue, particularly nitrogen narcosis. That concern is unduly exaggerated and contrary to the experience of the scuba diving community as reflected in the record. The Agency has treated the respondent differently from others, namely the Cousteau Society. Specifically, if the element of nitrogen narcosis, which is relied upon by Agency Counsel, in staged decompression dives had been applied equally to the Cousteau application, it too would have been denied.”

The judge later made further critical comments about NOAA’s delaying tactics, which had left Gentile “twisting

gently in the breeze” and contrasted the obstacles that Gentile encountered with the cooperation offered to the Cousteaus.

He then assessed other safety considerations, evidently convinced by the witness statements on Gentile's side that there was nothing about a dive on the *Monitor* that differentiated it in any significant way from dives that this deep diving community were making elsewhere all the time. He commented that:

“Conditions at the *Monitor* site do not appear to vary significantly from other diving sites. Depth, currents, turbidity, temperature and the like all vary significantly from day to day, oft-times contraindicating diving.

The Agency asserts that staged decompression dives appear to be unduly hazardous, while the appellant portrays them as almost routine.

Both represent honestly held views at nearly opposite ends of a spectrum where there is a middle ground. This position is not a compromise, but rather reflects an area where those who take risks venture beyond that which the academic and bureaucratic segments of the scientific community accept, by relying upon additional instrumentation and equipment, as well as experience.”

He dismissed NOAA's decision to consider members of the deep diving community as being just part of the general population of fun divers, stating significantly that they occupied an as-yet-undefined twilight zone somewhere between fun diving and commercial diving. He had no doubt that:

“The Appellant is not a sport or recreational diver as the terms

are commonly understood. The activities of Mr Gentile and his witnesses such as Messrs Watts, Deans and Bielenda lie in the penumbral area between sport and commercial divers due to the increased depth as well as the profit and business aspects of their activities...The appellant and other staged decompression divers are not sport or novice divers. Their training, experience and certifications reflect a substantially greater proficiency.”

In closing, the judge dismissed the allegations that NOAA had had an ulterior agenda in opposing Gentile’s bid, concluding that it was just fiercely committed to maintaining the sanctity of its own diving standards. However, NOAA did not have the right to impose its standards on the public sector just because the diving was to take place inside a Marine Sanctuary.

He recommended, therefore that NOAA’s original decision should be reversed and that Gentile’s application to dive the *Monitor* be approved.

Consequences

On Independence Day July 4, 1990, Gentile and a team of divers made a dive on the *Monitor*. His perseverance had paid off. The current was ripping but the dive was accomplished without incident.

Journalist Edward Colimore reported Gentile’s reaction.

“We finally got it,” he said. “It was tough but the dive made up for it. I’m ecstatic. The wreck has so badly deteriorated it hardly looks like a ship at all and most of the hull around the engine room is full of holes. It looks like a house which has studs but no paneling. The beams are there, but the hull plates are gone. It’s like a skeleton.”

Subsequent assessments of the *Monitor's* precarious condition suggested that it should be salvaged for posterity. Bringing up the entire vessel would have been too costly and technically difficult so key, more durable, less fragile, sections like the turret, the guns, the steam engine, the propeller and the famous red lantern (the last thing seen before the ship disappeared below the waves) were recovered and now reside in The Mariners Museum and Park in Newport News, Virginia.

A full-scale replica of the ship stands outside the museum.



HOWEVER, Gentile's campaign was to have wider consequences than just the realisation of a long-held ambition. The judgement in this case helped bring deep, planned decompression diving out of the closet.

Gentile's persistence in pursuing the judicial process brought together disparate communities sharing a similar space in the diving world. Following the judgement, those who were there, like leading northeast wreck divers Gentile and Bielenda and Florida-based deep divers Watts and Deans, would all return to their various groups imbued with new confidence.

What the judge had said and written gave substance and definition to the sort of diving they were all doing. He had validated and legitimised activities that had long been scorned and ignored by the scuba establishment, The judgement offered them plenty of encouragement that there was no real need for them to remain any longer in "the penumbra" that the judge had spoken of. They did not have to continue to hide away in the background, avoid publicity and fall in line with the establishment mythology that they did not exist.

A construct had arisen in US diving over the years. The terms sport diving/fun diving/recreational diving had come to apply solely to the practice of diving on air, using open-circuit equipment, in open water, within the no-decompression limits of dive tables and no deeper than 39m (130ft). Nothing else.

This ring-fencing was based at least in part on the rationale by which sport diving instructors were excluded from US mandatory occupational safety and health requirements for commercial diving operations established in 1977. This exclusion was very important to the sport diving establishment as it meant, among other things, that dive instructors did not have to have a recompression chamber on site while they were working.

Even more importantly, the limits were required by insurance companies as a precondition for providing companies with the insurance necessary for them to operate.

These instructional limits eventually turned into US sport diving's "red lines" and any underwater activity that took place outside these lines was by definition not sport, fun or recreational. This was despite the fact that hundreds of amateurs all over the country were engaged in diving inside shipwrecks, inside caves, using gases other than air, with planned decompression stops or deeper than 39m (130ft).

Most dive boats and dive resorts would not allow you to dive outside the red lines, most dive magazines would refuse to publish articles about any such activities and practitioners were not welcome to speak about them at dive industry and training agency events. Within the scuba mainstream, the commonly accepted protocol was to pretend that none of it was happening.

The cave divers shrugged their shoulders and did their own thing. They had their own training agencies and their own conferences. Wreck divers were less well-organised, but felt similarly. If the establishment did not want to recognise them, they were not going to beg. They would just continue to operate within a relatively closed community of like-minded people. This suited the establishment just fine. As long as these renegades stayed in their boxes, they could continue to be assigned “nothing to do with us” status.

Nevertheless, there were some in the deep, mixed gas, cave and wreck diving communities, including a number of Gentile's expert witnesses, who had businesses to run and would welcome access to a wider market of divers. For them, the judge's words were exactly what they wanted to hear. Perhaps it was safe to come out of the box? Perhaps there was no box?

NOAA's case justifying its refusal of Gentile's application had been based on this fictitious definition of what constituted sport diving and the judge had seen through the flimsy rationale and spotted the inherent contradictions. You could not place the Gary Gentiles, Hal Wattses and Billy Deanses of this world in the same category as people who only made occasional shallow warm water dives on their annual vacation and therefore apply the same restrictions to both groups. If NOAA insisted on its artificial construct of what defined a “sport” diver, then a different word was needed to describe Gentile, Deans and others.

It would not be long before someone coined that word.

Of course, one relatively obscure court judgement was not going to be the end of the story. It would take much more to convince those who had established the sport/fun/recreational diving construct to abandon it. The road to the eventual acceptance and adoption by the sport diving mainstream of

planned decompression, alternative and multiple gases, overhead environment training and closed-circuit equipment would be long.

But Gentile's judgement was one of the first steps along this road.

Meanwhile, there were a number of significant people whose interactions were already laying the foundations for change and they are the subjects of my next talk.

CRUCIBLE

THE ACTIONS AND INTERACTIONS OF FIVE
INDIVIDUALS THAT LED TO THE BIRTH OF
TECHNICAL DIVING

Talk time: 35 minutes

Today, when you execute planned decompression stop dives using mixed gas and multiple gases, with open-circuit or closed-circuit hardware, in the caves of Florida, Russia or Mexico, the wrecks of Scapa Flow, the Great Lakes or Truk, the abandoned flooded mines of Finland and South Africa or the walls of Palau - whichever of the alphabet soup of agencies trained you in this kind of diving - you will be carrying the same equipment, configured in one of a few recognized, accepted and well-tried ways, and using similar combinations of gases, decompression tables and procedures.

These methods and technologies were born among individuals and groups of sport divers in the USA several decades ago. Not only did these pioneers use their own experiences, enterprise and creativity to work out how to make safer, more efficient and longer-range extreme sport dives, but they also borrowed know-how from the military and scientific diving communities and turned it to their needs.

Technical diving was the metamorphosis of these people and their efforts into a coherent movement.

But was it really a movement? At times during the first half of the 1990s, for insiders, it certainly felt like it, even one with quasi-religious and revolutionary undercurrents.

After all, what is it that religions and revolutions share?

- An origin story
- An opposing force
- Messiahs, apostles, and disciples
- Martyrs, heroes, and legends
- Sacred texts and propaganda
- Slogans and symbols

Technical diving had all of these. The only thing it lacked was the kind of inspired leader with a brilliant idea that religions and revolutions coalesce around. This may have been for the best. After all, the driving forces in the disparate diving tribes who took technical diving forward were not the sort of folk who typically look for someone to lead them. They were mostly explorers with ambitions to go somewhere, see something or do something extraordinary, and they needed the means to achieve their goals and ensure as far as possible that they got back home again afterwards.

Getting back home again was an essential element of this philosophy. Otherwise, what would be the point? Consciously or otherwise, they were borrowing the sentiment expressed by US President John Kennedy in 1961, that the aim was not just “landing a man on the Moon”, but “returning him safely to the Earth” afterwards. Safety was the major concern in technical diving from the beginning, although the opposition within the mainstream sport diving community did not see it

that way and there were times in the early days when tragic bursts of accidents didn't make it look that way either.

However, in retrospect, technical diving was neither revolution nor religion. It came more from chemistry and physics than philosophy or politics. It was a product of several ingredients coming together simultaneously in the crucible of the US extreme diving scene in the 1980s and onward.

Some of the ingredients were situational. The development of the Internet and the flattening world offered improved communications and coordination, and technological advances in blending and boosting gave sport divers easier and safer access to gases. Increased awareness, accessibility and popularity in turn led to the establishment of businesses providing more professional equipment and consistent training systems.

But the most important ingredients were human, and, in the very beginning, it was the interaction of a handful of key individuals that provided the spark that flared into what we would come to know as technical diving.

These people are the subjects of this talk. One was a notable guru from the military, commercial and scientific diving worlds who lent his expertise, status and gravitas to ambitious sport divers lacking in all these much-needed areas. One was a true revolutionary. The others were explorers.

All were pioneers, all had unconventional methods and none could be easily confined or defined.

It is curious that, by the end of the 1990s, when technical diving had become part of the mainstream, for a variety of reasons, none of the five was still part of the scene. One had been lost. Others had drifted away. They had changed the sport diving world but were no longer part of it. Those for

whom change had been the goal dropped out. Their work was done. Those whose influence on the sport had been incidental to their other work just continued along different paths.

They all became celebrities, although none sought fame. The community they had helped create needed icons and their achievements happened to be iconic. They were the patron saints for the new acolytes and provided a good part of the myth and legend on which the sport was founded. Their places in technical diving's Asgardian Halls are assured.

The actual architects of technical diving would be the savvy entrepreneurs, inventors and engineers, charismatic prophets, tireless trainers, cosmopolitan travellers, gifted writers and natural marketers within the community who would keep the flame alight.

But without these five people and their combinations and interactions, there would have been no spark.

Did it all begin with the rebreather guy? Or the cave diver? Or the decompression guru? Or the captain? Or did it really start when the tech geek started writing about it all? As you look back in time, you find that the lines connecting them go all over the place; they cross, they separate, they reunite and then they spin off in different directions. I am tempted to pursue this obvious cave-diving metaphor further but instead, I will just tie it off here and leave you to attach more line as you wish.

Sheck Exley: Live Oak, Florida

Sheck Exley was part of the 1960s generation of US cave divers, and many considered him the greatest of them all. In the mid-1980s though, Exley was not so sure. He had a problem, and it was becoming increasingly clear that he was going

to have to solve it. His problem was helium. He didn't like it and he didn't trust it. Diving with helium got you bent or got you killed. But, if he didn't start using it, he was going to get left behind.

In 1970, Hal Watts, one of the country's earliest deep cave explorers and someone Exley looked up to, had suffered serious decompression sickness following a heliox dive in a sinkhole. Then in 1975, Exleys' best friend Lewis Holtzindorff was the first to use mixed gas on a cave dive and died in the attempt, although it was not the helium that killed him, it was the pure oxygen he was breathing too deep during his decompression stops that caused him to convulse and drown. Nevertheless, as far as Exley was concerned, this was a further sign that helium was to be avoided. He would stick to diving with air. He liked air, he trusted the air decompression tables and he knew he had a good tolerance for narcosis.

In 1980, Exley held the record for the deepest cave dive on scuba at 104m (340ft). Then, cave diver Dale Sweet broke the record on a heliox dive to 110m (360ft). Exley took notice. Six months later he successfully performed the same dive to the same depth using air. Who needed helium?

However, the following year, German cave diver Jochen Hasenmeyer descended to a depth of 145m (476ft) in the Vaucluse cave in France on heliox and completed a successful ascent. Then in 1983, Hasenmeyer extended his record to 200m (656ft).

Back in the USA, Exley was breaking distance world records in cave diving for fun, but in terms of depth he was falling behind and it was his aversion to using helium that was holding him back.