

comex

M A G A Z I N E



—50 YEARS—



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FIFTY GLORIOUS YEARS

Well, here we are. It is fifty years since the good ship Comex set off on her adventure in a world which at that time was still almost entirely virgin territory: the depths of the sea. Half a century during which this idea, this intuition, this dream that I had, evolved into a long and enthralling industrial saga, thanks to the hundreds and thousands of men and women who have worked for the company through the years and in all four corners of the globe.

As for me, and certainly for the vast majority of those people, it is a source of pride to have guided Comex to where it is today. Our shining reputation and renown are still a source of wonder to me, twenty years after we moved away from the offshore oil industry on which our success was founded. They are a source of pride too, because all through those long years, side by side with our prestigious clients - big oil companies, major industrial concerns, national governments and institutions - Comex made an important contribution to France's research efforts, to the prosperity of her economy and to the radiant success of her scientific culture.



Henri Germain DELAUZE
CEO

I feel proud too because our employees and associates – both past and present – are basically as bound up as I am with the things we have already achieved in our various fields of work, and with what we are still achieving with our vessels and our crews in the Mediterranean, in the Red Sea and in the Indian Ocean as well as in our laboratories at Marseilles, dedicated to hyperbaric research, to physiology and to finding out more about the marine environment.

And here is yet another source of pride: pride in the way Comex has managed to survive fifty years with its core values intact: intellectual rigour, trustworthiness, creativity, responsiveness, respect, high standards, the urge to achieve. These values have enabled us to push back the frontiers of human diving and to open the way for the robots, ever more sophisticated, which have gone on to replace human divers in the deepest parts of the oceans.

And finally, I feel proud because this half-century of thinking, planning, setbacks and successes will have helped to open up, in company with many other businesses, educational institutions and laboratories, a whole new world. A world which, I am convinced, will go on offering

humankind new opportunities as human knowledge increases, for this is a world which remains for the most part unexplored.

What part will Comex play in all this future progress? The answer? Is for those who today carry the torch that I kindled in 1962 along with Xavier Fructus, my dear wife Philbée and all who were with us at the very beginning. 1962 was the year I became 'the deepest Frenchman of all time' in the bathyscaphe Archimède, as my old friend Pierre Willm recalls elsewhere in this magazine. After a class act like that, maybe I was destined to succeed in the new enterprise I had just undertaken; destined also still to be around fifty years later to tell of all the happiness and satisfaction I have derived from this adventure.


Henri G. Delauze

50 YEARS OF IMAGINATION

Comex celebrates
its 50th Anniversary

FIVE DECADES

OF ACHIEVEMENT UNDER THE OCEAN



Few business concerns notch up their half century. Even fewer celebrate their 50th anniversary with the person who created them still at the helm. Although it is several years since its founder-president, Henri Germain Delauze, played an operational role in the company, Comex remains one of a select few organisations to have remained faithful to the course set by the founder, with fifty years of technological innovations and industrial successes all over the world.

In the course of these five decades, life at Comex has always been fascinating, as much for its staff as for its trading partners and its clients, but the course of Comex has never resembled a long, gentle river or even a quiet backwater; for it is important to remember that it is in the open sea that this organisation was born, grew and prospered.

Henri Germain Delauze discovered diving in the *calanques*, the creeks of Marseilles at the end of the 1940s, trying out the first watertight face mask designed by Georges Beuchat. He did not, however, immediately appreciate the

new requirements which this invention could meet a few years later. The perfecting of the Cousteau-Gagnan demand valve – which at the time constituted the missing link in the concept of the ‘free’ diver - would open up to those first divers horizons far broader than their breath-holding ability had previously offered. An infinitely longer time underwater, and depths of more than 20 metres: these now became achievable, having previously required traditional surface-supplied heavy gear. At the dawn of the 1960s, a new and almost entirely unexplored world was opening up to the infinite curiosity of humankind. The sea! For although vessels had sailed across its surface for thousands of years, its depths were still almost untouched; for only a few members of the armed forces and a handful of scientists had been able to explore them, in devices which were still both primitive and dangerous. At the time he set up the *Compagnie Maritime d’Expertise* – Comex – Henri Germain Delauze had just joined one of these teams of pioneers, to take charge, along with the engineer Pierre Willm, of the technical aspects of the bathyscaphe *Archimède*.

50 YEARS OF IMAGINATION



Comex's first big project, in 1963 at Saigon (bottom left), gave Doctor Xavier Fructus, pictures here in 1966 (top left), an opportunity to develop ground-breaking diving techniques which opened up new possibilities for underwater projects using support ships like the Sandokan (above), the first ship in the Comex fleet, built in 1973.

At the time the deepest part of the ocean floor was accessible only by bathyscaphe. Like the *Trieste*, designed by Auguste and Jacques Piccard, *Archimède* plumbed the abyss. In *Archimède*, which was later put on permanent display in the great hall of the *Cité de la Mer*, the magnificent maritime exhibition centre at Cherbourg, Henri Germain Delauze made a series of record-breaking descents. On 25 July 1962 he reached a depth of 9545 metres to become 'the deepest-diving Frenchman'; and he still holds that record today.

It seems prophetic that this exploit took place a few months after he founded Comex. This enthralling project at the cutting edge of scientific research would certainly delay Comex's actual startup, but the knowledge and experience

Delauze gained, the web of relationships he wove, and the fame which benefited the people of the *Archimède* era, were well worth the few months he spent away from Marseilles.

Comex was formally established in October 1961, with the full consent of Philbée, Henri Germain's wife, who agreed to invest the couple's modest savings in the venture. The young enterprise eventually took off very quickly, however, without experiencing the teething troubles and lean periods which plagued the majority of new businesses. It is true to say, however, that Delauze took a great risk in starting up in business. To launch a company in a new field of endeavour without the support of a big organisation or a rich backer showed at the time – and still does so today – a certain amount of recklessness. But it requires a certain amount of recklessness to succeed in an enterprise of this type. And whether because of the tremendous intuition of its founder or sheer incredible luck, Comex was an almost immediate success.

“ Whether because of the tremendous intuition of its founder or sheer incredible luck, Comex was an almost immediate success ”

Comex flourished because it was the first to offer its services in the undersea contracting field at the precise moment when government planners and big organisations were beginning to concentrate on the modernisation of infrastructure once the phase of reconstruction which followed the Second World War had been completed.

In this new market, the personal experience of Henri Germain Delauze soon gave him the edge. He was an engineering graduate

of the prestigious *Arts et Métiers*, with a master's degree in geology from the University of California at Berkeley in the USA. A few years before he had successfully completed one of the first great feats in what

was then a new field of endeavour, that of undersea engineering, as site manager for the construction of the road tunnel under the port of Havana. Add to that the celebrity value of having worked with Cousteau and with the bathyscaphe team.

Delauze's impressive track record immediately enabled Comex to land several big international contracts which got the company off to a flying start. They took on complicated, hazardous, ground-breaking projects, no easy task for Comex's young workforce, but extremely lucrative. These projects brought in the cash flow which was needed to get Comex going and guarantee its technological development for the next thirty years: the *Centre d'essais hyperbares* – the hyperbaric research centre, where doctors, scientists and engineers would in the course of time evolve the techniques and instrumentation which would enable Comex to set out to conquer the depths.

Doctor Fructus's research into the physiology of diving, the



Lock-out diving bells, developed from the 1960s onwards, freed divers from the tyranny of time and enabled them to work more productively and effectively on deep water projects.

fine-tuning of innovative mixtures of gases and Delauze's idea of bringing together two techniques which were then at the experimental stage: the saturation of divers in a chamber on the surface, and 'lock-out' diving bells to lower them, already pressurised, to the desired depth - it is this combination of practicality and research which formed the basis for Comex's dazzling success.

In 1962, a water supply project in Viet Nam generated the organisation's first significant profits. Three years later, it was the construction of *Idéfix*, the first bell-chamber system [the bell locked onto a deck decompression chamber, to which the divers transferred when the bell was brought on deck] which set Comex off on its meteoric rise to industrial success. In 1966, two divers saturated on Heliox (a mixture of helium and oxygen) reached a depth of 160 metres off Marseilles, a record-breaking dive which created a great sensation. This led to Péciney awarding Comex its first really big contract: the repair of a pipeline for the evacuation of aluminium waste at a depth of 105 metres off the coast of Greece. This project, completed without mishap and within budget, was the first to involve divers pressurised beforehand in a chamber and lowered to the desired working depth in a diving bell which was itself pressurised. At the time Comex was the only organisation in the world capable of operating at depths greater than 100 metres. The moment was opportune; the oil companies were starting to want to drill at these depths because the geologists had found very promising deposits, notably off Africa, Equatorial Guinea, Iran and in the North Sea. The first oil contract was signed in 1967 with Raymond Lévy, the then boss of Elf-ERAP, which later became the Elf group, to provide diving support for new drilling in Gabon and the Persian Gulf. The following year Shell and BP approached Comex about drilling rig contracts in the Bay of Biscay and the North Sea. Comex

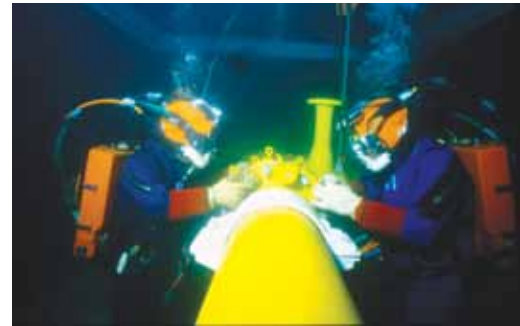
set up shop at Arcachon, Stavanger, Great Yarmouth... and ran a whole series of operations which were 'the deepest in the world', beating its own depth and duration records in the process. At the time Delauze and his men were the only outfit in the world to offer services of this kind, at such great depths and with such a good safety record, at a price that the offshore oil industry could afford. Behind the most resounding success stories there is often an element of being in the right place at the right time, with the right answers; and by good fortune and good judgment Comex was there just at the right moment. That just about sums up the story of the small firm from Marseilles which in a few short years became a vital link in the chain of the offshore oil industry. Suppose a firm approached Henri Germain Delauze and his team with a new problem. In a few hours, a few days or a few weeks, in any case on a time scale that met the client's needs, Comex dreamed up a viable solution and put it into practice. The company's reputation was built on this capacity for innovative thinking and the feasibility of the solutions it came up with.

At the end of the 1960s and the start of the 1970s the organisation experienced phenomenal growth on both the industrial and the research fronts. A second hyperbaric test centre was built in 1970 in the new premises at Mazargues, which the company still owns today. Here it is possible to simulate compressions, dives in the wet chamber and decompressions in conditions very close to the real thing. It was there that Doctor Xavier Fructus continued with the experiments first undertaken in 1968 into the use of hydrogen which twenty years later would take Comex divers to a depth of 701 metres, a record which still stands today. 1968 was also the year in which Doctor Fructus described the High Pressure Nervous Syndrome (HPNS) for the first time, which brought international recognition for his team

50 YEARS OF IMAGINATION



From its inception Comex initiated many ambitious research programmes which laid the foundations of deep industrial diving. Before the Hydra X project in 1992 (above), which broke the 700 metre barrier in a simulated descent, Comex's test divers had already reached 534 metres in the open sea during the Hydra VIII tests in 1988 (above right). The following year saw the start of the programme at Comex's test facility to develop pressure suits for the European astronauts (top right). All these activities were captured on film by Comex's in-house photographer, Alain Tocco (centre).



of doctors and physiologists.

At the same time, Comex was starting to develop 'wet submarines' for the oil industry. These crafts, sometimes referred to as underwater jeeps, were used to transport teams of divers and their equipment from one underwater worksite to another. Comex's industrial expansion increased further from 1973 onwards, when the first oil crisis struck, resulting in a sudden revival of interest in the North Sea oilfields and offshore exploration among Western nations and business concerns. At the same time Comex's overseas subsidiaries proliferated. After Gabon, Scotland and Norway, Comex expanded into Singapore, Brazil, Australia, the Emirates, Nigeria, the Congo, Angola and the USA... By 1975 the organisation had become too big, too complex and too multi-faceted to retain the same structure as it had started with. A holding company was set up with the original partners to supervise several specialised subsidiary companies: *Comex Services* for the oil and gas sector, *Comex Industries* for the design, construction and maintenance of heavy equipment like saturation systems and submersibles, *Comex Pro* for light equipment (helmets, therapeutic chambers for medical applications) and *Comex Equipment* for specialised scientific equipment. The company thus became an integrated industrial conglomerate of worldwide proportions, capable of designing important projects and carrying them through, and no longer an ad hoc provider of specialised services to a high standard. In the meantime, Comex's own engineers had learnt how to design diving support barges and the world's first dynamically positioned diving support vessel. The hyperbaric welding systems they invented were acknowledged to be the most efficient available. They designed and built robots, submarines large and small, equipment for deep divers, treatment chambers for medical applications, and a plethora of ultra-specialised tools to meet a particular need on a particular worksite. Four years after this necessary reorganisation, Comex suffered

its first severe economic setback. The causes were many: the continuing decline of oil prices in the second half of the 1970s, some development decisions, notably in the USA, which clashed with 'economic patriotism', a notion unknown in Europe, a shaky world situation and very little government support in France. The group was shaken to its foundations but emerged from its ordeal strengthened, with new partners and new prospects opened up by the second oil crisis which, in 1979, boosted the offshore oil market as surely and effectively as its predecessor six years earlier. While this was going on, in 1980 Comex reached its maximum global expansion, with a turnover of more than 1.25 billion francs from thirty subsidiaries and a workforce of 2500, including a thousand divers and as many engineers deployed worldwide. The firm designed both atmospheric submarines and submarines equipped with a diver 'lock-out' compartment and exported them to all four corners of the globe, including China and the USSR. Its fleet of diving support vessels grew as time went by: *Talisman*, *Seacom*, *Seabex*, *Orelia*, *Uncle John*...

But the volatility of the offshore oil sector did not go away, and a new economic storm loomed. In the mid 1980s, the crisis worsened and slammed the brakes on the virtually constant growth that the industry had enjoyed for two decades. Even so, the Comex teams went on breaking records, at the hyperbaric test centre at Marseilles and in the open sea. Research into the use of hydrogen by Xavier Fructus and his research team resumed after a break of several years and, one after the other, supposedly insuperable obstacles were overcome. In 1988, in *Hydra VIII*, divers worked at 534 metres in the open sea. Four years later the test diver Théo Mavrostomos went down to 701 metres in the laboratory chamber of the Comex hyperbaric research centre at the end of the Hydra X 'dive'.

These two records - and others - are still unbroken today. But the ever greater depths of oil deposits, combined with the

“ Nowadays Comex concentrates on underwater operations ‘made to measure’ in the field of oceanography, deep sea research, detection, bathymetry, archaeology and marine biology ”

Today Comex owns two oceanographic vessels at the cutting edge of technology: *Minibex*, built in 1987, and *Janus II*, which was launched in 2001



development of robotics, would gradually reduce the demand for divers, who were more expensive and more complicated to deploy than machines, which had no human feelings and did not have to decompress. And so Henri Germain Delauze set up Cybernétix, a Comex subsidiary specialising in robotics and automation, which came into being in 1985. That is how the undersea industry entered the age of robots, ROVs and teleoperated tools, which were also developed by *Comex Nucléaire*, another subsidiary of the parent holding company, for maintenance work in nuclear power plants. The 1980s were also the years of *Saga*, an ambitious ‘lock-out’ submarine developed in association with Ifremer, the French research establishment for the exploitation of marine resources, which pulled the plug on the project prematurely in 1987.

Those years also saw the beginnings of another unfinished enterprise: space, with the development of the space suits for the crew of the shuttle *Hermès*. This project was abandoned by the European Space Agency in the 1990s, at the moment when Comex was about to make its most decisive change of direction thirty years after it was founded. In March 1992, after almost ten years of strained relations with the banks, Henri Germain Delauze effectively handed over his principal subsidiary, *Comex Services*, to the Norwegian group Stolt, who renamed the organisation Stolt Comex Seaway. He retained six subsidiaries and 400 employees and maintained a presence in the nuclear industry, in the design, production and maintenance of therapeutic chambers for medical applications and in submersibles, scientific research, robotics, oceanography, survey work - and in archaeology.

Archaeology had always been one of Delauze’s passions, which he had pursued with the greatest experts in the field since the excavations at Grand Congloué with Cousteau in 1952. Over the years, most frequently with Robert Sténuit and always in cooperation with the governments concerned, Delauze financed

and led explorations under every ocean in the world, filling museums with exhibits found directly or indirectly through his efforts and those of his partners. Comex has discovered and reported the existence of a great many historic wrecks - all over the place, but above all in the Mediterranean – which are still unexplored from a scientific point of view: a splendid prospect for the underwater archaeologists of today and tomorrow.

Bit by bit, after the sale of *Comex Services*, the holding company sold off its subsidiaries or changed their direction. And so in 2001 *Comex Nucléaire* came under the control of a long-time partner, the Marseilles group Onet. Today the organisation consists of two divisions: the department of engineering for extreme environments and the department of marine operations. The first is devoted to diving chambers and equipment for high-pressure applications, like the equipment provided recently to Comex’s partner since 1971, the Swiss watchmaker Rolex, to test the water resistance of its latest diver’s watch, the *Sea Dweller Deepsea*, certified to 3900 metres but actually tested to 4800 metres. The second, which deploys two oceanographic vessels with dynamic positioning, the *Minibex* and the *Janus*, is devoted to underwater operations ‘made to measure’ for large public and private organisations, institutions and businesses, in the field of oceanography, deep sea research, detection, bathymetry, archaeology and marine biology. Comex also works in the space and scientific research fields. Henri Germain Delauze still sits in the president’s chair but in 2011 he entrusted his executive duties to his daughter, Michèle Fructus. Since then Comex has become a faithful partner in the *Agence des Aires Marines Protégées*, a body created by the French government to take an inventory of the marine species and habitats along the immense shoreline, of which France oversees a part on practically all the oceans on the planet, and continues to collaborate with national defence and with industry.





Interview with Henri Germain Delauze,
president and founder of Comex

**“IF I HAD MY TIME OVER
AGAIN, I WOULD DO EXACTLY
THE SAME AS LAST TIME”**

He it was who founded Comex – the *Compagnie Maritime d’Expertises* – early in 1962. He did so on the simple assumption that the undersea world, which the human race had only just begun to explore, would not always be the virgin territory which it had been since the dawn of time; and that the oceans, twice the size of the earth’s land mass, were poised to become the scene of new human adventures which were more intense, more complex and more uplifting than anyone could ever have imagined. Half a century later, he looks back with affection on this tremendous tale of technological and industrial achievement which he created, and on the legacy that Comex has handed on through the years to the history of diving on both a small and a large scale.



Here at the start of 2012, Comex is celebrating its fiftieth birthday. But how old is the concept of Comex?

I can't state a precise date when I said to myself, 'Hey, I'm going to set up a diving company!' I think it took a lot of consideration and a few significant moments before the seed of the idea germinated and grew in my mind: that there was work to be done under the sea and that the ocean depths were a world where economic activity would develop. In fact, I first started thinking about it when I first discovered the sea, at Toulon in 1941. That was when it first occurred to me that the sea could provide some welcome additions to the menu. And then, when I tried out my first diving goggles, designed by Georges Beuchat, I realised that I was hooked. From then onwards I went diving whenever I got the chance. When I was an engineering student at the *Arts et Métiers* in Aix-en-Provence, I used to escape to Cassis whenever I could get away. Then, during my brief military service, I discovered, in Madagascar, the amazing underwater world of the tropics. When I got back to Marseilles, I was recruited by Spiros, who specialised in compressed air; and then came my encounter with Cousteau, which was a deciding factor in my future career.

“ My decision to set up Comex was made in 1960 in the United States, when I was working for the US Navy. ”

Legend has it that your relationship with him was not a very happy one?

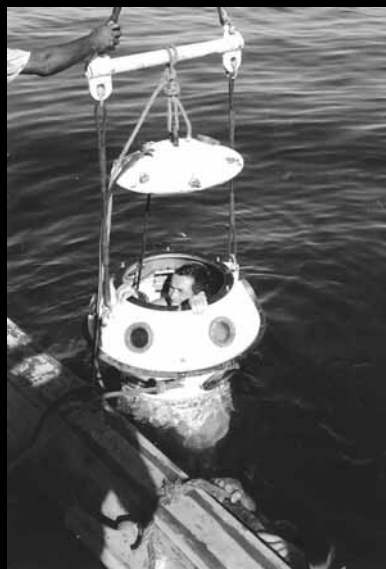
I have always had a great deal of respect for him, for what he did and for his exceptional contribution to the spread of knowledge of the marine environment. But we had different ways of looking at things, and different ambitions about what one could do under the sea. Our objectives were different; it

was logical, therefore, for each of us to go his own way. He believed in developing underwater 'habitats', which to me seemed very complicated, very costly and not very useful. Disagreeing with Cousteau was not an easily sustainable position. But the time spent as part of his team in the mid-1950s, notably on the underwater archaeological explorations at Grand-Congloué – the first such project in history

– played an enormous part in the considerations which led me to found Comex. Let's say that it was there that the idea really took root.

And how has Comex grown?

After the Cousteau exercise, in 1956 I was site manager for the construction of the road tunnel under the port of Havana for the *Grands Travaux de Marseille*, a huge Parisian enterprise of the BTP Bank which had headhunted me for my skills as both an engineer and a diver. That was my first big underwater construction project, and also an important step in my career. For as a result the Americans offered me a scholarship to study geology at Berkeley. At the end of that year, in 1960,



Henri Germain Delauze (pictured here at age 6) was born in 1929 into a family of wine-producers at Cairanne in the Vaucluse. From an early age he showed great academic promise, which led him to study engineering at the *Ecole Nationale des Arts et Métiers*. He left there in 1949, diploma in hand, and did his military service at the Air Force base on Madagascar. There he discovered the incomparable beauty of the underwater world of the tropics and began to consider a professional career in diving, which at the time was still in its infancy. And so in 1955 he was a member of the scientific team that went down to explore the resurgence of the Fontaine de Vaucluse. A year later, he was the site manager for the construction of the road tunnel under the port of Havana (Cuba) for the *Grands Travaux de Marseille*, and went down to the bottom himself in one of the very first modern diving bells. It was this project that won him a scholarship to study at the University of Berkeley in California, and led to a close and fruitful collaboration with the US Navy at the beginning of the 1960s.

I spent a few months working for the department of the US Navy responsible for undersea research. That was when I came to the decision to set up Comex. If I hadn't, I might perhaps have settled in the USA. Who knows?

But you came back to Marseilles to set up your business...

Yes. My wife and I had registered the company in October 1961, but the business really got off the ground in 1962, after my expedition with the bathyscaphe *Archimède* off Japan, where I remained for several months. When I came home in summer 1962, we landed our first really huge contract, at Saigon in Viet Nam, to lay water pipes on the bed of the Mekong River. It is thanks to this project that Comex started off on a firm footing. That project led to others which enabled the company to finance and set up, starting in 1963, the first civilian hyperbaric test centre in the world. With Xavier Fructus, Jacques Coustal, Robert Marly... that is where we launched our first deep-diving research programmes.

Who took an interest in these issues at the time?

Not many people. There was the Experimental Diving Unit of the US Navy, which had experienced several disappointments. Then there was a high-powered American businessman, Ed Link, who had very early on become fascinated by diving and hunting for wrecks – a passion I shared. He was the guy who founded Ocean Systems, an organisation which would be a serious rival of Comex for several years. In France there was Cousteau and the marine research body, the OFRS, the *Office Français de Recherches Sous-marines*. At that time the OFRS was working on the *Précontinent* series of undersea habitats, a programme which would come to an end in the mid-1960s, along with the project led by George Bond in the USA for the US Navy.

How did you set up your team at that time?

The core was made up of people I had met in the course of time and experience, people in whom I had detected the qualities which seemed to me essential to the company's success, and with whom I had a good rapport. And then I had the great good luck to recruit Xavier Fructus, who had annoyed Cousteau by having remained on friendly terms with me and by attending the inauguration of Comex's first hyperbaric test centre. The 'good doctor' Fructus joined us and we made a terrific team, with him developing all the hyperbaric physiological knowledge that I needed to get ahead technologically.

What goal were you pursuing at that time, sinking as you were all the profits from your civil engineering projects into deep-diving research?

I was firmly convinced that new and very important prospects were about to open for deep diving; and I do not know of any better way of being the first in a new field of endeavour than concentrating on research. It is the only way to progress technologically and acquire technical knowhow. Both are essential to take the lead, and stay in the lead. Striving for excellence – for myself and the people I worked with – was the only way to guarantee the organisation a chance to progress, and to attain the importance and the reputation which would enable it to continue to develop.

And did you attain those objectives that you set for yourself in building the first hyperbaric test centre?

For the most part, yes. For example, even if we did not in so many words invent saturation diving, we were the ones who developed it to the level where it is practised now. In that field it was Comex, and particularly thanks to its research at the hyperbaric test centre, which acquired the knowledge and

50 YEARS OF ENTHUSIASM

On board the *Archimède* (below), he became 'the deepest-diving Frenchman' with his descent to 9545 metres in July 1962 – the year he founded Comex. Henri Germain Delauze subsequently took part in all the deep-diving experiments his company undertook, without letting go the reins as company boss. The knowhow that Comex acquired in the design and construction of submarines won them many contracts abroad, including in the USSR. After preliminary contact during the 1960s, Henri Germain Delauze actually played host in 1971 to the Soviet leader Leonid Brejnev at the Comex premises at Marseilles.



the technology essential to develop the professional diving systems which were then, and which remain, the best in the world. It was Comex too that laid down the principles, set out the main decompression tables, perfected the gas mixtures and defined the physiological issues to put divers at progressively greater depths. And not only for the satisfaction of doing it - to go down, survive and come back up again, but to work down there in good, safe, comfortable conditions.

Is that what enabled you to become an industrial-size concern so quickly?

It is what enabled us to become the best in our field, and therefore much in demand, which in turn meant having to recruit a lot of people to keep pace with those demands. Our expansion corresponded with the rise in importance of the offshore oil industry. When we launched Comex in 1962, the oil companies were drilling in a few metres of water, no more. Then they started to go deeper and deeper in search of oil. We therefore worked on the technical and scientific means to keep pace with this development, so that divers could work on the wells and pipelines to make this exploitation possible.

When the depths reached the point that over the years you had defined as the limits of human diving, what future did you envisage for deep diving?

The shining future which has in fact come about. In the 1960s, 70s and even 80s, man was the only 'machine' capable of going down to perform a complex task under water at whatever depth. Robotics, which developed in the course of the

“ From the 1980s onwards it was easy to imagine that deep diving would end up being a matter for robots and not for human divers. ”

same period, began to reach a useful level of maturity during the 1980s; and from then on it was easy to imagine that deep diving would end up being a matter for robots and not for human divers - for obvious reasons of security and cost. In any case, it was in 1985 that I founded Cybernétix, in particular to develop the machines which would, little by little, replace human beings at the bottom of the sea. And so deep diving has continued to develop, to the point where today things are done which 50 years ago would have belonged in the world of



Whether with the Comex team of test divers during the Janus IV operation in 1977 (above, left), in discussion with Doctor Xavier Fructus (centre) or with the astronauts of the European Space Agency (above, centre), Henri Germain Delauze always remained very close to his colleagues. He was equally friendly and approachable towards the politicians and entertainers who came to dive with him on board the *Rémora 2000*, his two-man

submarine. Among his 'co-pilots' were actor Gérard Depardieu, former Ecology minister Jean-Louis Borloo, and the reigning monarch of Monaco, Prince Albert II.

pure science fiction. An example is the recovery by ROVs in open water of the black boxes from the aircraft that crashed in 2003 shortly after taking off from Sharm-el-Sheikh. The same goes for the recovery, in even more challenging conditions, of the black boxes from the Rio-Paris flight several months ago.

What are you proudest of?

Everything – and everybody, or almost. Because we really have done some amazing things in the course of this half-century. The machines we developed, the projects we brought to fruition, the problems we solved, the prestigious clients we worked for, the fascinating fields of endeavour we explored – the sea depths, of course, but also space and the terrestrial environment – the virgin territory we explored – all that fills me with pride in the name of the community of people that goes under the name of Comex. On a more personal level, I am first and foremost proud not only of having founded this firm with my wife, but also of having steered it the way I have, and of having both the flair and the luck to put together the teams who have done as much as I have to build Comex's

reputation, to work with the marvellous people I have come across in the course of these fifty years. I am also very satisfied with the contribution I have made, through Comex, to society as a whole. For example, when I see the hyperbaric chambers that we built, in daily use for patient care in hospitals, I say to myself, 'We did something useful there!' And I am moved too when I see that the great majority of the people who have worked for Comex over these 50 years, whether they stayed a few weeks or a decade, are themselves proud of having shared in this adventure and serving under the Comex flag. The fact that for several years a club of Comex 'old comrades' has existed (not, I assure you, at my instigation!) is also a source of pleasure and pride. For 'clubbability' is not very common in the world of business, where individualism rules.

Any regrets?

There are always things one would like to be able to do differently, but as I have already said, in an interview several years ago, if I had my time over again I would do exactly the same as last time.

50 YEARS OF INNOVATION



‘GOING DOWN!’

Half a century of technical progress

Ever since Comex was founded, its workforce has shown an extraordinary genius for dreaming up, designing, fine tuning, manufacturing and exploiting thousands of innovative solutions and devices, to penetrate ever deeper beneath the surface of the oceans. From unbeatable records to unsung exploits, we look back on fifty years of surprises, thrills and successes.





>> Professor Pierre DRACH, Director of the research body CNRS, asks Henri DELAUZE to become the scientific director of the bathyscaphe laboratory. He accepts. In this capacity, as scientific officer and engineer on board the *Archimède*, he is responsible for every one of the 36 principal dives organised annually from 1962 to 1966, in waters as far apart as Japan, Puerto Rico and Madeira. On 28 July 1962, in company with Lieutenant O'Byrne and Professor Sazaky, he sets a new depth record for the bathyscaphe with a descent to 9545 metres in the Kuril-Kamchatka Trench off Japan.



1962



1967

>> *Idéfix*, the first lock-out diving bell is deployed initially from the catamaran *Obélix*. The system enables helium-oxygen bounce dives in the 100 to 120 metre range. Using this system, in March 1967 COMEX divers repair a pipeline at IKEA in Greece for Péchiney.

1971



1970

>> *Total Sub*, Comex's 'wet sub', can take three divers (breathing air) to a depth of 50 metres. It carries the air supply, the tools and the batteries needed to power the sub. It is equipped with an audio communications system by transponder. This special submarine was commissioned from Comex by the oil company TOTAL, who nicknamed it 'the underwater jeep'. *Total Sub* is used for two years on an immense oil production complex, entirely underwater, at the ZAKUM oil field in the Persian Gulf.



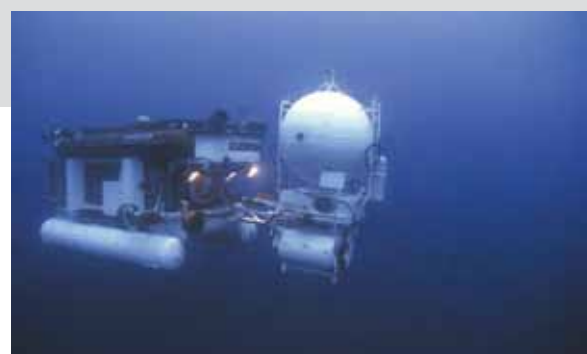
>> At the request of oil companies and big underwater projects, Comex find themselves developing some innovative machinery. This underwater cable-burying tractor can bury power and telephone cables 1.5 metres under the ocean floor to protect them from possible damage by fishing gear, ships' anchors, etc. This machine weighs several tonnes. It has caterpillar tracks and is deployed from a big crane barge. It is controlled by the two-man submarine *Globule*, which submerges and, like a helicopter, comes to rest on the purpose-built platform of the tractor. The pilot of the *Globule* takes control of the tractor via an electromagnetic connection, and drives it along the bottom, checking the burial of the cable as it goes.



1974

>> A rush job: This picture shows how COMEX can rise to the occasion. Here *Caisson 2500*, which forms part of a diving system which is being installed as a matter of urgency in the Persian Gulf, is loaded into a cargo plane at Marseilles Marignane airport. Time is money; and transporting *Caisson 2500* by sea would have cost the client dear.

The *MARCO* observation-manipulator submarine, certified to 450 metres, has worked a year at 350 metres on the bottom of Lake Geneva conducting a survey for the laying of several tens of kilometres of gas pipeline. The dives lasted twelve hours. On board were a pilot, a copilot and an observer. Here the *Marco* is operating on another project, 'Telpipe', the placing at a depth of 150 metres of a radio wave generator on a pipeline. The tests consist of demonstrating the feasibility of using a pipeline as a signal conductor, making remote control operations possible.



1967

>> The wreck of the *Girona*, one of the galleons of the famous Invincible Spanish Armada, is located by the Belgian historian and diver Robert Sténuit, Henri Germain Delauze's treasure diving associate. It takes two summers of exploration along the cliffs of Northern Ireland before the divers recover a fabulous hoard of silver and gold coins, jewels, cannon and everyday objects. These are now on exhibition in the Ulster Museum at Belfast thanks to the joint efforts of Henri Germain Delauze and Robert Sténuit.



>> The futuristic experimental dives in the PLC series, then *Physalie*, begin on March 5 in Comex's first hyperbaric centre. Henri Germain Delauze, in company with the American physiologist Ralph Brauer, makes the very first descent in the series which will take them down successfully to 335 metres. At that time, excluding a few one-off attempts, divers rarely descend beyond 80 metres. Between March 5 and June 27 1968, seven chamber dives to a maximum depth of 365 metres are achieved go off without any major problems. It is a giant leap forward. The oil companies are starting to take notice of Henri Germain Delauze's little firm at Marseilles. The great adventure is beginning.

>> The limits to which divers can descend are being pushed back all the time. The test diver François Fallourd successfully descends to 250 metres in the open sea and works there without difficulty.



1969



1977

>> As part of the *Janus IV* operation, Comex divers go down to 450 metres, proving that it is possible to work in satisfactory conditions of comfort and safety at depths which were previously believed to be impossible for divers to reach.



1979



>> The *Moana* series of submarines, of which five models will be developed, achieves its first export success.



>> *Seabex One*, the flagship of the Comex diving support fleet, is equipped with the biggest industrial diving system in the world, with 8 chambers able to accommodate 12 divers capable of working at depths of up to 450 metres.

1981



>> The introduction of the 104-metre *Seacom*, launched in July 1983, improves Comex's off-shore operating capability still further.

1983





1987

>> The result of a partnership between Ifremer and Comex, the submarine Saga remains to this day the most successful 'lock-out' submersible ever designed. Capable of operating down to 600 metres, it was equipped with a pressure complex for 6 divers. With a length of 28.06 metres and a submerged displacement of 545 tonnes, Saga offered the interesting possibility of serving as a rescue craft for crippled naval submarines.



1988

>> The fruit of 5 years of research, the *Hydra VIII* operation enables a new depth record to be set for a working diver in the open sea: 534 metres. Nobody has ever beaten this record, or even come close to it.



2000



>> *Rémora 2000*, designed for marine archaeology and observation to 610 metres, begins taking scientific samples in the open sea.



2003

>> Launched in 1987 but always maintained to the highest technological standards, the *Minibex* salvages the wreckage of the Lightning P38 aircraft of the pilot and writer Antoine de Saint-Exupéry, which was discovered in 2000 by the diver Luc Vanrell off the rocky inlets near Marseilles. And so, 60 years after his last flight, the mystery of the author of *The Little Prince* is solved at last.



2006

>> To evaluate the consequences of global warming, governments and research laboratories step up their studies at sea. Comex is approached with increasing frequency to supply the logistics which are indispensable for such operations.



2008

>> Hyperbaric chambers are one of Comex's specialties. They are used to speed up healing and fight infection more effectively. When Saint Anne's Hospital in Toulon relocates, they ask Comex to take care of the transfer and renovation of their hyperbaric chambers, built in Marseilles several years earlier.



1991

>> As part of the programme for the space shuttle *Hermès*, the European Space Agency entrusts Comex with the task of developing the spacesuits for its future astronauts. Jean-Loup Chrétien, Michel Tognini and Jean-François Clervoy spend several weeks at Marseilles testing their suits in conditions as close as possible to the real thing, on full size models of the spacecraft – which in the end will never take off.



1995

>> During a survey operation with side-scan sonar, Henri Germain Delauze and the crew of the *Minibex* locate, more than 100 metres down, the French Navy submarine *Protée*, which perished at the end of December 1943 after hitting a German mine between Marseilles and Toulon. Seventy-four seamen lost their lives in the disaster.

>> The autonomous two-man submarine *Rémora 2000* and the ROV *Super Achille* explore a modern wreck. Launched 3 years earlier, the *Rémora 2000* will have a little brother the following year: *Thétis*, commissioned by the Greek Ministry of Culture for archaeological dives in the Aegean Sea.

1997

1992

>> *Achille*, the first ROV (remote operated vehicle) developed by Comex begins to be deployed for exploration and filming. And so the age of robotised deep diving begins.



2010

2009

>> The hospital at Papeete, Tahiti, takes delivery of its new hyperbaric chamber completely renovated by Comex.



>> The Swiss watchmaker Rolex, a business associate of Comex since 1971, takes delivery of a special machine designed to test the waterproof case of their new diver's watch, the Sea Dweller Deepsea, at extreme pressures.



>> Henri Germain Delauze, the founder-president of Comex, hands over to his daughter Michèle Fructus, who has climbed the company ladder before becoming Director-General. *Janus II*, the flagship of the Comex oceanographic fleet, undertakes several assignments for the environmental protection body the *Agence des Aires Marines Protégées*, which has embarked upon an extensive inventory of the significant marine species and habitats in French-administered waters.

2011



PIERRE WILLM

You shared the bathyscaphe adventure with Henri Germain Delauze. That was in the early 1960s, at the time when he founded Comex. Do you recall it as fondly as he does?

Most certainly; I must say that we met in excellent circumstances. The *Archimède* operations in the waters off Japan were demanding and fascinating: one had the impression of pioneering in a huge area of totally uncharted territory.

How did he come to take part in this adventure?

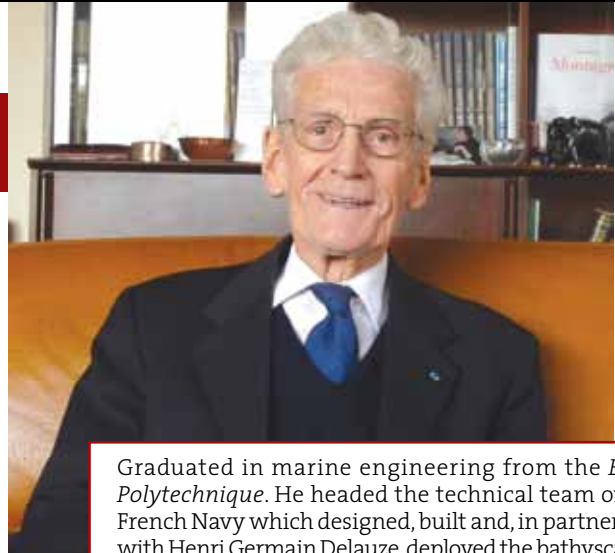
He was a brilliant young engineer, a graduate of the *Ecole des Arts et Métiers* and he had already made a sensational job of designing and building an underwater tunnel at Havana just before Castro came to power. People like me are generally very proud of having studied at the *Polytechnique*, but that does not stop us having a great respect for the *Gadz'Arts*, as *Arts et Métiers* graduates are called. They don't just know things; they can put their knowledge into practice too. The friendship I feel for him began on this basis – we all need each other – but also because at the time we first got to know each other, there was always an element of possessiveness, a touch of pride, a tinge of competitiveness...which with some people could be divisive. In our case, it was this competitive edge that brought us together, and which gave rise to a genuine friendship which has lasted almost 60 years.

Possessiveness, pride, competitiveness... surely there was everything there to make the sparks fly?

Yes; but all the same we got on well from the start. He was there in his CNRS capacity [*Centre Nationale de la Recherche Scientifique* – the French equivalent at the time of the Science Research Council in the UK]. Since the end of the war the CNRS had developed – largely thanks to Cousteau – submarine research programmes which guaranteed France a permanent place at the top of the world rankings in this field. In fact Henri Germain Delauze's career and mine were two of a kind. We had both been fortunate enough to obtain our engineering degrees just after the Second World War ended. At that time it took guts to graduate – and he had this in spades; he has put himself on the line all his life – but someone with plenty of courage and determination could achieve a tremendous amount.

This year, as well as Comex's 50th anniversary, we shall celebrate another important event in Henri Germain Delauze's life: an event which you yourself witnessed personally.

Yes indeed. Since July 25 1962 he has been *le Français le plus profond* – the holder of the depth record for France. I myself had got down to 9200 metres with Georges Houot a week earlier. Then Henri broke the 9500 metre barrier with Lieutenant O'Byrne and Professor Sasaki, reaching exactly 9545 metres. However, we had not set out to break any records; it just happened. As with the Americans two years earlier, who had gone down to 10,900 metres, it was off Japan in the Marianas Trench – also known as the Mindanao and the deepest in the world – that we reached these depths.



Graduated in marine engineering from the *Ecole Polytechnique*. He headed the technical team of the French Navy which designed, built and, in partnership with Henri Germain Delauze, deployed the bathyscaphe *Archimède* between 1958 and 1970.

Might it be said that the bathyscaphe adventure made France a front runner in the race to the depths and that it is thanks to the bathyscaphe, and to people like Henri Delauze, that France has remained a leader in this field?

Obviously, that was a contributory factor. Professor Auguste Piccard invented the bathyscaphe with Belgian financial backing, but it was the French navy who, with its officers and engineers, added the finishing touches to make it operational. The Americans were hard on our heels with talent and some success, but it was the French who invented fundamental things like the access trunking to the pressure sphere.

In your opinion what part did these scientific researches at great depths play in France's industrial destiny?

We blazed the trail. After the bathyscaphe, I went to the *Institut Français du Pétrole*, where I was appointed director of their marine study programme. That was in 1963, a time when hardly anyone had started talking about oil under the sea – offshore oil as the Anglo-Saxons call it. It was in those years that we developed new drilling techniques and special platforms for the North Sea, in particular thanks to the support fund for the petroleum industry, which enabled France to build up a network of extremely effective firms such as Coflexip, Technip and Comex...who did not call attention to themselves but always stayed in the game. A couple of years ago, when I watched the Americans battling a leak from a well in the Gulf of Mexico, I said to myself, 'Without the French, none of this would have been possible'.

Do you believe there is a brilliant future for humankind at great depths?

Not in the short term, because operating at great depth, whether with people or with robots, is still very expensive and is not yet realistic economically. We must never forget that at the beginning it was the Navy, and therefore national defence, which invested in underwater technology for strategic reasons. To a large extent Ifremer [*L'Institut Français de Recherche pour l'Exploitation de la Mer*, the French institute for research into, and exploitation of, the oceans] and its equipment came into being as a result of this military research, without which it would assuredly never have seen the light of day.

The only fields which so far have proved economically viable are the management of coastal waters and oil. Henri Germain Delauze's great talent lay in anticipating the needs of oil companies once they had to look beyond the coast for new supplies of petroleum. I admire people like him for that. They sense things before anyone else does, and follow their ideas through. Similarly he understood the role that a civilian firm could play

in building pressure chambers which were needed for the divers who during the 60s and 70s worked on the expansion of commercial and naval ports and naval bases and creating new ones. Comex has become a world leader in this field. I personally drew up the plans for these first chambers for the naval base at Toulon. This was a starting point.

JEAN-MICHEL COUSTEAU

Ten years before Comex was founded, your father, Commander Cousteau, brought about the first underwater archaeological exploration in history on the Roman wreck at Grand Congloué, off the narrow inlets that are the calanques of Marseilles. His team included a young engineer with a passion for diving. His name was Henri Germain Delauze. What memories of him do you have?

When their collaboration began, I was too young to know Henri Germain Delauze well. But I knew he was there and that he was part of the team. I heard his name spoken and I understood that he was important. However, it was not until much later that I realised how greatly, and how soon, the two men's career paths diverged. Each of them travelled his own road, pursuing his ambitions, following his dreams, with phenomenal success. But for my part I do not think there was ever any rivalry between the two men. Their career paths were too different for that; it is even difficult to make comparisons between them. As we all know, Commander Cousteau achieved his ambitions by informing and educating; Henri Germain Delauze was equally successful in carving out a career for himself in industrial and commercial diving.

Nevertheless many experts consider that each of them acted as a pioneer in his own field of endeavour, and that this brings them closer together, at least from the point of view of their contribution to the history of deep sea diving?

Despite their different aims, they do in fact have a shared history which nothing can remove. Henri was a trailblazer in his own field, just as Commander Cousteau was in his. Each of them made his mark in the world. But one cannot compare their work to the same extent.

Comex built up its reputation in the offshore oil industry, but today it works more and more in the environmental field in an effort to achieve a proper balance between the preservation of nature and industrial development. Did this 'interpenetration' of two different disciplines seem to you unavoidable?

Today we are living in a communications revolution, which enables every individual on earth to contact others, swap ideas and interact with everyone. This revolution enables realms up to now reserved for a very small number of people – such as space and the undersea world - to be made universally



Jean-Michel Cousteau, the elder son of Commander Cousteau, was a member of the team of divers and scientists set up by his father. In 1999 he founded the Ocean Future Society, an organisation dedicated to oceanographic exploration and nature conservation, based in the USA.

accessible. And if this revolution has been possible, it is truly thanks to the tremendous developments which industry and technology have undergone. The protection of the environment, especially the oceans, where all living things had their origins, is obviously very important, but we have believed for a long time that this aim is achievable without harming industry, which enables us to function. Obviously, industry gets things wrong, but it is up to us to set the alarm bells ringing when necessary, and to put pressure on the industrialists to respect the rules. Participation by organisations as experienced in the industrial world as Comex is clearly very good news indeed, for we have seen the damage inflicted by this conflict between environmental and economic concerns. There is no place for unfruitful opposition.

Great efforts have been made in recent years all over the world to set up marine conservation areas, sanctuaries for marine life. Do they, in your opinion, seem appropriate to meet the challenges?

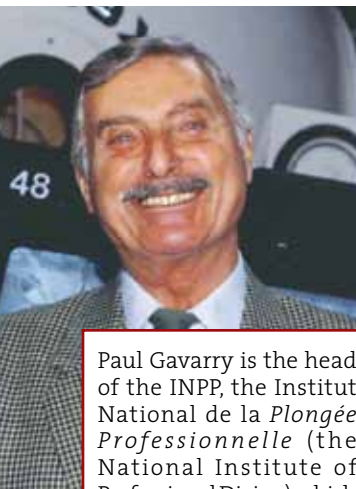
The idea itself is a good one, it is even indispensable, but it irritates me that a lot of talk goes on but people are slow to act to protect the oceans, of which at the present time only 1 to 2 per cent are protected. It also irritates me that we still know very little about the seabed, less than 5 per cent at most, because we don't protect resources we don't know about. It's time to stop the smooth talk and get to work. And I am overjoyed that Comex is taking part in this work by putting its experience and knowhow at the disposal of the

Agence des Aires Marines Protégées. [a body dedicated to the conservation of marine environments], which is in the process of inventing a new way of managing the oceans, a way which respects the environment and its ecosystems while taking into account the interests of Humankind.

Your father and Henri Germain Delauze got to know each other at the very beginning of the Calypso adventure. At the end of his life your father wished that this legendary boat could finish her career at Marseilles and that the general public could see her. Similarly it has long been the wish of Henri Germain Delauze that the diving equipment and submersibles developed by Comex could be exhibited in

the town where they were born. Do you still cherish a hope that these wishes will one day come true?

It would be a dream, but it's out of our hands. The decision isn't up to me, or to the old-timers of Calypso, or even to Henri and Comex. We have done everything within our power to avoid Calypso being sold outside France. What is left of her – and that is diminishing with every passing minute – is in dry dock in Brittany. It was the dream of my father Commander Cousteau and my mother Simone, and it has not yet been brought about, nor has Henri Germain Delauze's dream of making the submarine Saga accessible to the public. It is regrettable, but maybe it isn't irrevocable. One day, maybe...



Paul Gavarry is the head of the INPP, the Institut National de la Plongée Professionnelle (the National Institute of Professional Diving) which is located on the site of Comex's own school for deep divers. He has been associated with Comex since the beginning.

PAUL GAVARRY

You were one of the people who saw Comex come into being. What are your recollections of this time?

I got to know Delauze in the early 1960s. At that time he had recently joined the team of the bathyscaphe *Archimède* and had just set up in business for himself. We began working together in 1966, he with Comex and I under the auspices of the French Navy, on major projects at depths of 400 or 450 metres. With Comex, we

benefited from the presence of the best scientific minds in the field of high pressure and diving physiology.

At the time, was there something of a race to the depths?

Everyone did his own thing and it worked quite well. I particularly remember the summer of 1975. In June, on board the *Triton*, a naval vessel, we broke the 300 metre barrier by diving to 307 metres. A few days later we received a telegram from Comex saying they had reached 326 metres off the coast of Labrador in very difficult conditions. And then, at the end of June, it was the US Navy who announced they had reached a depth of 346 metres off the Bahamas. We were not actually competing with each other, but it felt like that.

What other experiences did you share with Comex?

We continued to work together both in laboratory dives and in the open sea. September 1976 saw *Janus IV* off Toulon with three Comex divers and three divers from the French Navy going to 460 metres, with one dive to 501 metres. I can also recall a simulated descent to 601 metres at the Navy hyperbaric centre in May 1983, which was the limit at which Heliox was breathable. It was then that we turned again to hydrogen, which

the French Navy had tested on rabbits in 1968. The Hydrox Comex/French Navy programme began in December 1983 at Comex's hyperbaric test centre.

The school you are now in charge of is a sort of legacy of Comex?

Yes indeed. The INPP, the *Institut National de la Plongée Professionnelle* (the National Institute of Professional Diving) is located on the site where Comex founded their own diving school in 1968 to train their deep divers. In 1974 the school was taken over by the Marseilles Chamber of Commerce to develop training in industrial diving, a sector which at the time was undergoing a huge expansion, especially at Marseilles and spurred on by Delauze and Comex in particular. It is this *Centre de Travaux Immérgés* [Industrial Diving Centre] at Marseilles which became the INPP of today.

In what circumstances?

In the 1980s there was a wish on the part of the government to create a national institution to provide for the training of workers in hyperbaric conditions, in other words professional divers for industry, scientific projects and the development of therapeutic chambers in hospitals. The aim was also to provide a watching brief and keep up to date with technological developments, to train pilots for civilian submarines, to give the seal of approval to individual professional diving equipment... Henri Delauze was one of those who pushed for the INPP and gave it his support; and this institution owes him a great deal, both for training and for the follow-up of hyperbaric technology. Without Comex, we would certainly not be where we are today in the world of undersea operations and human diving. The existence of an enormous number of rules, procedures, tables of reference, technologies and gas mixtures used today is attributable wholly or partially to Comex and its teams.



An engineer by training, Christian Réderon has spent all his working life with the oil group Total. The posts he has held include Director of Operations for Total Exploration and Director of Technical Studies for the group. He is a director of several companies in the oil industry.

CHRISTIAN RÉDERON

And afterwards?

I always stayed in touch with what Delauze was up to, because there was always a possibility that Total would need his ideas and his people. After the Frigg pipelines, he embarked on a fascinating technical adventure, Comex Seal, which consisted of dreaming up wellheads which were much better designed than anything in existence at that time. He was the first to propose wellheads fitted with a horizontal bolting system, while at the time everyone went in for vertical bolting. The thinking behind this innovation was to improve safety, which would facilitate access to the wellheads for maintenance and repairs. That, in our view, typified Comex: a company and a boss who could dream up innovative technical solutions and put them into practice swiftly and effectively.

You say 'a company and a boss'...

Because at that time Comex and its leader were inseparable. He was Comex. He had a rare and astonishing ability to motivate his workforce to such an extent that they would cheerfully follow wherever he might lead them. He was also somewhat fatherly with his people, whom he could sweep joyously along in the wake of his own enthusiasm. And yet all of them were engaged in dangerous work which required innovative techniques which were themselves risky; but he made use of this to spur everyone on and to get the very best out of each man by setting an example. He was a leader of men in the most positive sense of the word.

You talk about him as if he was a very special person?

In the very restricted, very exclusive and very special world of the offshore oil industry, I cannot recall any individual who has gained such a powerful reputation as Henri Delauze. More often than not, you were familiar with the organisations or the crews, but it was rare to get to know people, even the bosses, as individuals. Delauze was an exception. The best proof of this is that his name is still very well known in the oil service world, although he left this business a long time ago.

How do you explain this?

Apart from the seriousness of his organisation and the quality of the work it turns out, he himself has a very charismatic personality, coupled with a warm and friendly nature, in an environment which itself is far from friendly. That certainly has something to do with it.

If you had to define Henri Germain Delauze in his capacity as an entrepreneur, what would you say?

I would say that he has always been very imaginative, endowed with an ability to grasp, and understand immediately, the best and most innovative ideas, wherever they came from. Not only was he able to capture those ideas, but also to motivate his teams to develop them and bring them to fruition. He has created Comex in his own image: an organisation endowed with a tremendous ability to dream up innovative schemes, then put them into practice – and make them work.

Tell me about the circumstances in which the collaboration between Total and Comex in the offshore oil industry began.

Our first contact was in the 1960s to develop some fairly futuristic projects in the Middle East; then Total and Comex really started to work together at the beginning of the 1970s in the North Sea. At that time we had some semi-submersibles, one of which, the Uncle John, had been designed and built by Comex. From these semi-submersibles divers went down to 100 or 110 metres to clear out the stuff that fell onto the seabed from the oil rigs. At the time it was the drilling department that handled these matters; and so, in my personal capacity, I came to know Comex and its boss, albeit fairly superficially at first.

When did the two of you develop a closer relationship, on both a personal and a professional footing?

A little later on, that is to say in the mid 1970s. We had just discovered the Frigg gas field, on the boundary between Norwegian and British waters. A distinctive feature of the Frigg gas field was its distance from the shore; this necessitated laying at least one, and in practice several pipelines at a depth of 100 to 150 metres to bring the gas we extracted to the coast of Scotland.

And Comex took that job on?

Precisely. On this very big gas field, Elf Aquitaine had the job of developing the production units, while laying the pipelines was Total's responsibility. At once we asked ourselves: who, in Europe or elsewhere, is capable of laying pipelines at depths of 150 metres? The obvious answer was: nobody. And so we contacted Henri Germain Delauze, who had a reputation for coming up with imaginative technology in challenging situations. We put the problem to him, and shortly afterwards he came to see us with a solution which enabled us to overcome the obstacle: hyperbaric welding. Nowadays, everyone goes in for hyperbaric welding, but at that time only the Americans were starting to take an interest in it, and only Comex had mastered the technique at such great depths.

How did the project go?

Without a hitch, to the best of my recollection. There was not a single serious technical problem, either during the planning stage or when putting everything into practice. The pipelines were delivered on time and there wasn't the slightest difficulty when they were put into service – ten out of ten!



NARDO VICENTE

Such as?

I still have a lump in my throat when I remember the dives in *Remora 2000*, the two-man submarine which he piloted with fingertip precision and consummate skill. He invited me several times to share this amazing experience with him. We explored banks of coral several hundred metres down, and ancient wrecks full of amphoras, of which he has discovered a great many in the course of his career.

In the world of diving it is often said that Delauze and Cousteau are the two personalities who made the greatest contribution: in France, of course, but also world wide. Do you agree with this evaluation?

Both played starring roles in the history of diving, Cousteau because he introduced the marine and the undersea world to the general public, with films that still linger in the memory; Delauze because he understood that here was a field full of opportunities for scientific and technical research and discovery, a place where mankind could forge his own future.

You as a scientist and Henri Germain Delauze as a businessman – have you worked together from time to time on shared projects?

Yes, because in spite of the loathsome reputation which is too often attributed to industrialists – sometimes with good reason – Delauze and Comex have always taken into account the fragility of the environment in all they do, and have never neglected environmental issues, even at a time when few people concerned themselves with such matters, apart from a handful of enlightened scientists like me. About 20 years ago, when I was the elected representative in charge of environmental affairs in the town of Marseilles, we advocated a solution, which is still topical today, to minimise the impact on the marine environment of water discharged from the purification plant. The solution which we supported – and which Comex was clearly capable of bringing about – was to lay a pipe in the *calanque* [inlet] of Cortiou, at the point where the filtered water was pumped into the sea, and to discharge this effluent in very deep water several kilometres out to sea. Paul Ricard and Alain Bombard were on our side in this. Twenty years on, this project has still not been carried out, but all the same I am fairly confident: European regulations demand that by 2015 the only water we discharge near the coast must be of immaculate quality. To comply with these regulations we shall – sooner or later – be obliged to adopt the solution which Delauze and I have been advocating for a long time.

Nardo Vicente is Professor of Marine Biology at the Faculty of Sciences of Marseilles-Saint Jérôme. He is one of France's foremost experts on the marine environment. He is also the scientific director of the Paul Ricard Oceanographic Institute on the Ile des Embiez.

How did you get to know Henri Germain Delauze and Comex?

I knew Henri Germain Delauze long before I knew Comex, because when he and I met for the first time Comex had not yet been set up. It was in 1958 at the marine research laboratory of Endoume at Marseilles, where he was completing his first jobs in the tiny cubby-hole which had been allocated to him on the second floor of the building. As for me, I had just completed my studies at the faculté Saint-Charles [University of Provence] and I was making a modest start on my career in marine biological research. I was therefore present at the birth of Comex and watched the dazzling rise of its founder, who succeeded in building a worldwide empire in just a few short years.

Didn't the creation of this empire distance him from laboratories and scientific matters?

On the contrary! First of all because at the time when Comex started out, Henri Germain Delauze was still devoting a considerable part of his time to the bathyscaphe *Archimède* and to scientific research. Later, because he has always believed – and the successes he notched up through the years have proved him right – that it is his talent as an innovator which makes his business ventures successful. In his chosen field, science and innovation are closely linked. That, I believe, is one of the reasons why he has always had a very close relationship with scientists. Moreover, throughout his career, he has frequently made his vessels and equipment available to researchers like me, free of charge and with much enthusiasm.

What links have you kept with Comex over half a century?

I have always remained very close to Henri Germain Delauze and to Comex for reasons which I have just explained, but also because many of the students who passed through my laboratory have gone on to make their careers with Comex: Bernard Gardette is just one example. This close relationship has enabled me to participate in numerous experiments conducted by the Comex teams, notably the *Hydra* series at Comex's hyperbaric centre: research that extended the frontiers of knowledge and capability in deep diving. But I have other memories of Henri Germain Delauze too, more personal and more friendly.

This year Comex is celebrating its 50th anniversary. What do you imagine the world will be like in 50 years, when Comex is gearing up to its centenary?

It's hard to say, especially as I shan't be there to see it. Having said that, I have not forgotten that, contrary to what other pioneers thought half a century ago, Henri Germain Delauze never believed that human beings could live under the sea for an appreciable length of time. As he himself has been asserting for as long as I have known him, I think that in fact there will be fewer and fewer people under the water, but more and more machines, robots, devices automated to serve humankind and to expand human knowledge. I believe that 'human' diving will still exist, but primarily as a leisure activity. For science and industry, it will be

machines that will play the most important role. But what a role! Scientist that I am, I have been convinced for a long time that in the future it will be the oceans that will supply our essential needs, from food through minerals to pharmaceuticals

Do the companies which are currently active in this field still have a rosy future ahead of them?

And how! In the 21st century, there will be just two great adventures available to mankind: the oceans and space. Do not let us forget that today, after more or less a century of exploration, what we actually know about the depths of the sea is roughly equivalent to the surface area of Paris – which means there is still plenty to do!

LESLIE LEANEY

As an expert of diving history, what would you say about the contribution of Comex and of Henri Germain Delauze in the development of professional diving?

I discussed Comex's place in history with oilfield diving historian Chris Swann. One thing that sticks out was how far sighted Henri was even in the very early days of the company. Comex was the first private diving organization to have its own hyperbaric center. Others that existed were either government operated or connected to large medical centers. He saw how quickly deep diving was advancing and that the existing Navy decompression tables were not adequate for the speed of commercial diving development. Developing their own tables and gas mixes in their own facility was a tremendous and smart business move by Comex. Also Henri's strong engineering background gave Comex a very strong technical foundation. His American competitors did not necessarily have that. They were very strong in the field but did not have a comparable in-house technical base to grow up from. Henri was also skillful in romancing support from the French oil companies and the French government. I guess he was maybe a little too good with the government as his old boss Jacques Cousteau rapidly found himself in second place to Henri when looking for French funding for ocean related projects. «I do not think the Captain likes you very much,» was part of government briefing to Henri at the time.

Is there something in what Comex invented or first used that any diver will remember or will still use in 50 years?

In commercial diving it would probably have to be heating the gas for delivery down to the diver. Comex realized the massive heat loss from the divers lungs when breathing mixed gas and came up with this concept. They were first and it became an industry standard.



Former diver Leslie Leaney is British, and the co-founder of the Historical Diving Society in the USA as well as the founder and editor of the Historical Diver Magazine, which publishes articles by experts in the history of diving.

How do you imagine the future of professional diving in the next 50 years and the position of companies like Comex in this future?

It is hard to say. We have witnessed this Hi-Tech revolution that has changed so many different things in so many fields. In the last few decades we have witnessed the reduction in human deep diving operations as robotics has now taken over. ROV's and AUV's seem to be the immediate future, and one-atmosphere diving continues to remain viable. I believe there will always be a need for human intervention in shallow water diving, in harbors, ports, bridges and in-shore operations. With regard to Comex, I agree with Chris Swann. They have walked a steady career path from civil engineering and industrial type diving, to oilfield diving, and as the company evolved, are now working in the environmental field. Comex has adapted to the specific diving wants and needs in various industries. After 50 years that is now part of their genes, their corporate culture. What Steve Jobs did with Apple, Henri has done with Comex, including a succession plan. I believe their innovate culture will keep them well positioned in diving during the next 50 years.

JACQUES ROUGERIE

You have known Henri Germain Delauze for a very long time indeed. How do he, and the organisation he created, figure in your own career path?

Henri Germain Delauze has played a major role in my career. For forty years he has taken an interest in my work and has always been there for me when I needed him. The way Comex has evolved and developed over the years has brought an enormous amount to my own work, notably in overcoming problems associated with pressure. This competence and this knowhow where matters hyperbaric are concerned have contributed greatly to my own work on undersea houses and seagoing vessels.

What sort of relationship do the two of you have?

He has always been a role model for me, as the personality who has pushed his company to the very top and become a world leader in his field and in the development of the research programmes and technological advances which have brought about spectacular advances in diving.

How did you come to know Henri Germain Delauze and Comex?

At the end of the 1960s one of the Comex executives, Lamazou I think, looked into the studies I was making at the time. He wrote me off as a mere dreamer. 'Imagine! An architect who designs houses under the sea!' Not only was this notion outside the remit of Comex, which at the time was developing primarily on the industrial side, with divers working in saturation; it was outside Henri Germain Delauze's own beliefs. Nevertheless, he was sufficiently open-minded to look at, and analyse, other people's work without prejudice. And that is what he did with my plans – and he did not view them with as critical an eye as Lamazou had. He was brilliant. Unlike his engineers, who naturally focused on offshore oilfield diving, he paid careful attention to everything that might possibly advance the cause of diving in general. He had imagination; he had vision; he was able to think globally: qualities which he still has today, and which have been a tremendous help to me. Ever since we met for the first time he has always been there for me whenever I asked for help, whenever I needed encouragement. His kindness was unfailing, his criticism constructive. In his eyes I have always been a dreamer, but a pragmatic dreamer, a dreamer who actually builds his dreams. Exactly as he himself does!



Jacques Rougerie is an architect by training. Very early in his career, however, he came to specialise in underwater habitats and futuristic ships. He designed and built several 'houses' under the sea, as well as many diving and navigational devices. He is the designer of the *Sea Orbiter* project for a floating, semi-submerged laboratory.

When you say he helped you and was always there for you, what precisely does that mean?

From the beginning he gave me access to Comex's laboratories and to Doctor Xavier Fructus, who allowed me to participate in experiments in undersea living. These experiments were essential if I was to understand the problems I was facing. Thanks to Delauze and Doctor Fructus, I was able to spend long periods underwater, which enabled me to experience the physical effects for myself, and to understand the difficulties of living in these extreme conditions. Ten years later, with Bernard Gardette, Fructus's successor, we brought about *Hippocampe* [Seahorse], an experiment in underwater survival off the isles of Frioul at Marseilles, 20 years after Commander Cousteau's operation *PréContinent*. The experiment took place in December, as Bernard Gardette wanted to conduct tests in a hypothermic situation. For me this was a determining factor which I could never have had without the support of Delauze and the skill of the Comex engineers. We were all so delighted

with the result that we organised a 'Christmas Party Under the Sea' for the children of Comex staff members a few days after the experiment was concluded. The Navy came to take part in this operation, which was also broadcast live on the Yves Mourousi Show, which at the time was France's most popular lunchtime current affairs programme. All that happened at Christmas 1981 and I shan't forget it in a hurry.

Even if he never believed that undersea habitats would become available to all, did you ever manage to convince Henri Germain Delauze that your work could have applications for the general public?

When I designed *Aquaspace*, a 22 metre trimaran whose central hull is completely transparent, Henri Germain Delauze listened attentively and was keenly interested. He followed the progress of the project step by step, and was later inspired to build his own *Seabus*, a tourist submarine which started its career at Monaco before being deployed in the Bahamas.

Your flagship project today is called *Sea Orbiter*. Does it fall into the same 'Comexian' category as your previous projects?

Absolutely. The idea for *Sea Orbiter* came to me about ten years ago, after an Atlantic crossing in *Aquaspace*. Together with Jacques Piccard, Henri Delauze was one of the very first people I spoke to about this dream of a big oceanic observation vessel drifting along with the current. Immediately he gave me his support and encouragement when everyone else who was in the know about this project just laughed. At the

time we even hoped to build *Sea Orbiter* at Comex Marine, the shipyard that Henri Germain Delauze had established at Marseilles, and where his oceanographic research catamaran *Janus II* was built. Alas, that did not come about – I think it was still a little ahead of its time – but the way he reacted to this disappointment was, for me, yet another proof of his liveliness of spirit and his farsightedness. It is all very well for him to be a pragmatist with his feet on the ground, but he has always been a visionary too, with a degree of prescience which is rare indeed. Although intuitive and far-sighted, he also has what it takes to bring things about. On this level we are similar: we aren't content just to dream; we make our dreams come true. That is how the Saga was born, a fabulous undersea project which people far less open-minded and pertinent than Henri Delauze dismissed as unrealistic, even though it was a visionary project which in part inspired *Sea Orbiter*.

And so, in common with Henri Germain Delauze and all your colleagues you believe that the future of mankind is closely linked with the sea?

More than ever. Look: there is talk once again of Man under the sea, after a good 20 years of silence. That really does not

surprise me; I have always been convinced that the destiny of future civilisations lies in the oceans. Likewise I am convinced that diving is still in its infancy. It is well to remember that the history of diving started less than a century ago, which is nothing in relation to the time scale of human evolution. As Henri Delauze sensed, long before anyone else, it is evident - and the projects which have appeared in recent years have proved – that the energy of tomorrow will come from the sea, that the food of tomorrow will come from the sea, that the mineral resources of tomorrow will come from the sea, that the medicines of tomorrow will come from the sea...The names of the pioneers in this relentless evolution will never be forgotten. Men like Delauze have opened up this new field of activity which is the sea. But the sea in the broadest sense of the word and not merely the surface of the sea, as mankind has understood it for a long time. Someone who dives does not have the same perception of the sea as someone who is content to skim its surface. It is in this that I have infinite respect for Delauze, for his enterprise and the hundreds of men whom he has succeeded in carrying along in his wake: making them work, certainly, but also making them dream.

JEAN MANCHON

Not many firms have an organised, active club for their former employees. What is your explanation for this?

I think it is above all because we were happy working for Comex. There was a pleasant atmosphere. People liked being together while living and working a long way from home. Conditions were fairly hard at times, but then what we were doing was not very conventional – and we earned a good living... A lot of 'old comrades' consider themselves incredibly lucky to have taken part in this adventure. They all feel a genuine pride in having been a part of this organisation which has always enjoyed a reputation and a charisma which inspired us all. And this reputation was well deserved, because without any false modesty I can say that in the world of deep diving, we were the best.

To what do you attribute this mindset?

In the years when the offshore oil industry first got off the ground, professional diving was a new field of endeavour, with very few trained people. And the pay was excellent compared with the great majority of jobs where no diploma or special qualification was required. So diving attracted a load of very different characters: professionals, executives, service personnel... It was this diversity that made things interesting. Today, everything's different. The underwater environment has become very focused, very technological, very automated - but Comex people go on doing amazing things, and their work still sets people dreaming.

And so the family is still growing...

Yes. Since we set it up in 2003, the *Club des Anciens* (Old Comrades' Club) has issued more than 300 membership cards and publishes a little magazine, *Le Ludion*, on a regular basis. Comex is truly a close-knit family, gathered around Henri Delauze and his daughter, who has taken his place at the head of this organisation and under whose leadership the adventure continues.



Jean Manchon is a retired catering manager who has spent almost all his working life with Comex. In 2011 he took over from Michel Bouhis as President of the *Club des Anciens de Comex*, the Old Comrades' Club for former Comex employees.

THÉO MAVROSTOMOS

Tell us how you first came in contact with Comex?

It was 1974, and I was 23. I had served in the navy and worked at Marseilles with my father in marine maintenance and hull cleaning. Then I replied to a small 'Help Wanted' ad. Comex was looking for divers. I had to undergo a competitive examination; I passed and was taken on. I was then trained by Comex as a saturation diver and they sent me to the North Sea, to Africa, to Asia...everywhere there were projects that required divers. We worked at depths of 50, 100, 200, 300 metres... sometimes more.

How long did you work offshore as a diver before taking part in the Hydra programme of very deep dives with hydrogen?

Several years. But first of all I trained as a welder before working with the scientists and Monsieur Delauze at the hyperbaric test centre. And then, for Hydra X, the attempt on the 700 metre diving record, I was asked if I would be their second stand-in diver. I had always reacted well on deep dives – I had already dived to 450 metres in the open sea [as opposed to at the test centre] several times – and so I accepted the proposition. And when divers who had more experience of research diving than myself subsequently pulled out of the project, I finally entered the chambers of the test centre with Serge Icart and Régis Peilho to conduct the experiment. At 675 metres, they did not want to continue. But I was feeling fine, I was clear-headed and I wanted to go on to the end, to the 700 metre goal that we had set ourselves. And therefore I argued all night with Monsieur Delauze to convince him, and he and the doctors gave their agreement. And so I went down to 701 metres in the Comex test centre. It is still the deepest dive in history.

How long was the subsequent decompression phase?

We stayed 23 days in the chambers before we got out.



Since his record-breaking descent to 701 metres in 1992 former naval repairman Théo Mavrostomos has been 'the deepest man in the world'. He has stayed with Comex for more than 20 years as a diver, a welder and a test diver.

What sort of memory has this left you with?

It was a life-changing experience. I became 'the deepest diver in the world' and I did some amazing things thanks to this achievement. I shall always cherish some fantastic memories, and I feel enormous gratitude for Comex and its chief. I am grateful not only for that particular moment but also for the tremendous career they made possible for me, which has given me a life most people can only dream about.

Did that experience bring you closer to Henri Germain Delauze?

Of course. When I was working on site we didn't often see him, and when he did arrive it was a special occasion. Comex was a big organisation and when I joined the firm Delauze was already a legend in professional diving circles. Then Hydra X came along, and I was naturally very pleased with the way things were turning out for me.

FRANCIS VALLAT

You undertook a very special project with Comex. What can you tell us about it?

It was in 1980, on a project which was indeed very special and very tricky: the pumping out of the tanker *Tanio*. The vessel had broken in two and her forward section was resting on the sea bottom at a depth of about 100 metres, with 12,000 tonnes of crude oil in her tanks. I was acting on behalf of the French tanker fleet Soflumar. The idea was to bring one of our 25,000-tonne ships, the *Port-Joinville*, to collect the crude that we were going to pump out. At that depth, with a temperature close to freezing, the oil was practically solid and we had to place a sort of hollow pillar 120 metres high between the *Port-Joinville* on the surface and the hull of the *Tanio*, to feed through the flexible hoses which would enable us to pump out the crude.



Francis Vallat has been President of the French Maritime Cluster since its creation in 2006. He has spent his whole working life in maritime transport in general and tankers in particular. He is also vice-president of the *Agence Européenne de Sécurité Maritime*, the European Maritime Safety Agency (EMSA).

Did it work?

Brilliantly! This operation was a prodigious achievement masterminded by Comex, because the French government had decided against leaving this crude at the bottom of the sea, with the accompanying risk of having to deal with a pollution incident in the long term.

What did Comex design to bring this about?

The entire operation, from A to Z. The idea was to use one hose to send hot water from the vessel on the surface, down to the tanks of the *Tanio* to warm the crude and make it viscous enough to enable it to be pumped and brought up to the surface by a second hose. Down below there were ROVs, submarines and divers working and watching.

You say it was very tricky?

Yes! Before we could install a huge boiler on the bridge of a tanker to heat the water, we had to be very persuasive, especially with the insurers, in order to get the go-ahead for this operation. That was our first achievement. And carrying out the operation without a hitch in these very sensitive conditions, that was another achievement.

What do you recall about Comex on this operation?

I was astonished by the professionalism and the cleverness of the Comex team in general and their boss in particular, in terms not only of the design, the execution and the mastery of

an innovative and extremely complex system, but also of the productiveness and the effectiveness of their work. OK, so I was the nominal operational director of the project, but most of the credit belongs to Henri Germain Delauze and his team. We shared a splendid story of human endeavour, all striving together for efficiency and success.

What sort of relationship did you have with him?

We hit it off straight away. He reminded me of Ruy Blas, the hero of a play by Victor Hugo. I can still picture him, 'a force to be reckoned with'. Like Ruy Blas, Delauze is out of the ordinary. He has the ability to relate to people – to his own teams and to everyone else, whatever their social level – and to create empathy. He has that indefinable quality which is much sought after in showbusiness: presence, the inexplicable something which makes some people stand out from a crowd where others go unnoticed. Another of his strengths is the way he has kept Comex's reputation and fame intact after the sale of its principal subsidiary. He is a great leader.



PHILIPPE DE GUILLEBON

You are one of a select few who can say you knew Henri Germain Delauze before he founded Comex; in other words you have known him for more than 50 years. Can you remember how you first met?

Of course. How could I forget? We got to know each other in Japan during the oceanographic expeditions with *Archimède* and we became quite friendly very quickly. We were both young and enthusiastic and we had certain ideas, certain ideals in common. That is what brought us together and also kept us in touch with one another all these years, ever since the end of the *Archimède* adventure.

Even after you retired from the Navy?

That did not change our relationship at all. From the moment when we bonded, Henri Germain Delauze has always been an extremely faithful friend – his friends and relations have often told me that this is one of his distinguishing qualities. Even when he had become a big boss with many demands on his time, he stayed in touch. He is a man whom I respect and admire hugely. What's more, I consider myself fortunate to be his friend.

You say he is a faithful friend. In what way?

Well, for example, every time he embarked on an important operation with his Comex crews he invited me to join them as an observer, not only when I was still in the Navy but afterwards, when I had become a mere 'tourdumondiste' (a round the world yachtsman) in my modest sailing boat. That is how I came to be present at a great many experiments at his hyperbaric testing centre at Marseilles, or at sea.

So you too have played a part in this great story...

I played a far more modest part than Henri, but yes, it is true that I took part in the *Archimède* adventure then, which means

that I get invited on a regular basis to events concerned with French oceanography. This gives me the chance to meet up with many old friends, Henri Delauze included, such as at the *Cité de la Mer* at Cherbourg, where the bathyscaphe is now on display.

Admiral Philippe de Guillebon was the second in command of the bathyscaphe *Archimède* during its campaign off Japan. After a career of more than 30 years in the French Navy, he is now a blue water yachtsman.

And where an exhibit is also devoted to Henri Delauze and to Comex...

Yes, and rightly so. Comex played such an important role in undersea exploration that it would be hard to forget it or to fail to give it the honour it deserves. Of course, the French Navy also participated in the development of diving, for technological and strategic reasons, but the contribution made by Comex, which has worked – and still works – for industry, science and defence, was very significant. Comex was a driving force in many operations. And Henri has always been at the forefront, for he has never been shy of rolling up his sleeves and slogging away to get things done. In my experience I have not come across many big bosses who have shown as much courage and daring as he has throughout his career.

Is that the secret of his success?

I think it is one of the reasons why he is successful. Another reason is his ability to recruit the right people at the right time. Nobody is as successful as he is without having this talent for bringing people together and motivating them so completely that they always give of their very best. Henri Delauze is an unrivalled leader of men, motivated by a sense of invention and by the application of those inventions to useful ends.

JOHN HUFF



John Huff is the President Director General of the American company Oceaneering, a world leader in the design and construction of industrial diving equipment. He has many years of experience in deep diving and in the offshore oil industry.

Could you tell us one or two significant stories you remember particularly about Comex and you or Oceaneering?

When I came to Oceaneering in 1986, Comex was already a legendary story. In our industry ... As a matter of fact, Comex worked on several drilling rig jobs when I was President of Western Oceanic... This was from the early 70's till mid 80's when the rigs were sold to Diamond and Noble... Comex did a very unique leg repair on one of the mat supported jack-ups we had in the Adriatic... Probably the most significant story about Oceaneering and Comex was Henri wanted to merge Comex and Oceaneering (well, this was the term he used, although we all knew it was a purchase... the discussions broke down over whether we would go after mostly project works (which Comex was very good at) or mostly technical services This was in 1986 and nobody was doing very well... By 1987, Oceaneering had refinanced itself and had a few years "breathing room" so we did not continue the discussions....

What could you say about the contribution of Comex and Henri Delauze in the development of deep industrial diving?

Are you kidding...? Henri was the one of the two most important contributors to commercial diving the world has ever seen.... (the other was Mike Hughes, the founder of Oceaneering)... Henri was a true pioneer in all the deep water techniques, gas mixtures, safety policies, training... He pushed the envelope of what a man could do underwater so far past what diving had seen, it literally created a new industry....

When and in which circumstances did you meet him first?

We first met in about 1975 when I was in the offshore drilling business... We became friends when I went to Oceaneering in 1986... He invited me to his home in Marseilles... it was the neatest place I had ever seen... seeing his home and being around him outside the "work place" (although, I would quickly add, every place in the world was a "work place" for Henri... he was constantly thinking about better ways to do things... as well as more creative ways to make money...) his home told me a lot about what a creative person Henri was... we gave him one of our Jim suits (one atmosphere diving device) for his "museum"... He gave me an amphora he had salvaged from a wreck in the Mediterranean..

Let's make a little sci-fi: regarding to what happened in the submarine world during the last fifty years, how do you imagine the next fifty years for companies like Comex and Oceaneering?

Do you remember 20,000 leagues under the sea... well, think of a world 100x as unique as that one and you are about half way to what the undersea world will look like as we approach the midway point of the 21st century... no doubt in my mind it will be mostly robotic (sorry Henri...) the sort of technicians we have on the surface can visualize in 2 dimensions a three dimensional world... a place that covers 70% of our planet will be the main domain of many of our natural resources, food, energy, minerals and perhaps even something as simple as space to live... I could go on and on...

Any other issue or event about Comex you would like to talk about?

Great question... Henri Delauze is the type of person that comes along about every 100 years... his contributions to the "ocean world" put him in the category of "renaissance man"... What a great story and a wonderful life...

EVERYTHING'S FINE ON THE MARQUESAS

'*Tout va très bien, Madame la Marquise*' – everything's fine – is the refrain of a much-loved song, and *Les Iles Marquises* are the Marquesas Islands in French Polynesia. In the song the Marquise's château burns down and everything is far from fine. However...

For four years Comex scientists have been involved in taking an inventory of the rich natural resources in the waters under French jurisdiction. Now they are doing more of the same, in co-operation with the *Centre National de la Recherche Scientifique* (CNRS), the national scientific research centre. More of the same; but a long way away from previous projects off the coasts of Provence and Corsica, and even further from the Atlantic Ocean and the English Channel. This time around, their work is taking them to the Pacific Ocean in general and the Marquesas Islands in particular. Comex has undertaken this new mission on behalf of the CNRS and one of its environmental research bodies, the *Centre de Recherche Insulaire et Observatoire de l'Environnement* (CRIOBE), an environmental research body based at Moorea in French Polynesia.

The distance factor will, however, make it impossible to make use of Comex's vessels, *Minibex* and *Janus*, which are routinely deployed in French home waters. A New Zealand ship, the *Braveheart*, has been specially chartered for this mission, which will be spread out over several weeks in January and February 2012. Nevertheless, Comex will bring along their own detection instrumentation and the ROV [Remotely Operated Vehicle] *Super Achille*, which the scientists involved are accustomed to working with. The *Institut de Recherche pour le Développement* (IRD), *l'Institut Français pour la Recherche et l'Exploitation de la Mer* (Ifremer) et le *Museum National d'Histoire Naturelle* (MNHN) are closely associated with this project.



A New President for the Old Comrades



Jean Manchon, who takes care of the 'historical side of Comex, has just been elected President of Comex's club for former employees, the *Club des Anciens de Comex* (CACx), of which he has been a

member since the club started. He succeeds Michel Bourhis, who has held the post for six years and whose devotion, involvement and excellent work have been appreciated by everyone. Jean Manchon, aged 70, joined Comex in 1970, where his organisational skills and his talent for people management soon became apparent. He was responsible for feeding and housing the workforce on a great many Comex projects over the years on all the oceans of the world and on dry land in all five continents. Throughout his long and distinguished career with the organisation, he was admired and appreciated by all the employees whose everyday subsistence depended on him. For the record, we can reveal that he is the first 'non-diver' to be elected to the presidency of the CACx, which is in itself quite an achievement. All our good wishes go with him as he takes on his new responsibilities.

A Cité de la Mer at Marseille in 2014 ?

A vast *Cité de la Mer* (City of the Sea) is due to come into being at Marseilles, on the site which in the 1980s was occupied by Comex and Ifremer (short for *Institut français de recherche pour l'exploitation de la mer*), the French Research Institute for the Exploitation of the Sea. At that time the two organisations were working hand in hand on the *Saga*, nicknamed 'crache-plongeurs' (literally, 'spit divers'), the world's largest civilian diver lock-out submersible).

At least, that is what local officials are saying, in the person of Didier Réault, the deputy for the town of Marseilles with special responsibility for the sea and

the shoreline, who seems to be very enthusiastic about this project.

On this site, where the state-sponsored underwater archaeological organisation, the *Département des recherches archéologiques subaquatiques et sous-marines du ministère de la Culture* (DRASSM), was established in 2009, the city fathers are planning to build a huge world-class aquarium and a museum of diving and undersea exploration. The *Saga* would be one of the star exhibits of this museum. Its size (28 metres long and displacing 545 tonnes) is such as to make it feasible for visitors actually to look around it.



The *Saga*, a 'lock-out submarine' which Comex developed in the 1980s in association with Ifremer, may well be the highlight of the museum of diving which the city of Marseilles plans to set up in the *Cité de la Mer* at Estaque, where the *Saga* has been kept since she was built.

Getting ready for the World Congress on Protected Marine Environments

Preparations are now under way for the third World Congress on Protected Marine Environments, which is scheduled to take place from October 21 to 25 2013 in Marseilles, city of the Phoenicians, which has been designated the European Capital of Cul-

ture for the year 2013. More than 1000 experts and scientists will meet there, and several meetings have already been held to work out the administrative details of this conference, which is so vitally important for the future of the marine environment.

The Plastic Ocean Foundation uses the Minibex for filming



The huge and worrying amount of plastic waste of all shapes and sizes floating on the surface of the oceans and lurking in their depths is becoming a cause for major concern among scientists all over the world.

To increase public awareness and prick consciences, a British charity, the Plastic Oceans Foundation, is co-producing a movie which is due to reach our screens in 2013. Devoted to this 'man-

made global catastrophe', as the Foundation describes it, this film is currently in the course of production; and several scenes were shot last October on board *Minibex* off the coast near Marseilles. Producer Jo Ruxton, who has worked for a long time with the BBC's Natural History Unit, is in charge of the project. She cares passionately about the environment and devotes most of her energy to conservation issues. This is a subject which has interested her for a very long time, but she became even more passionate about it after she was diagnosed with breast cancer, an illness which doctors attribute more and more readily to environmental causes.

Jo Ruxton's team - a dozen people and an impressive amount of movie equipment - spent three days on board Comex's oceanographic vessel to film the waste - particularly plastic - located during previous inventories of refuse on the sea bed of the Mediterranean. This refuse is accumulated by the currents and is often found in quite large concentrations directly below the sea routes taken by the ferries between the French mainland and Corsica, Africa and the countries around the Mediterranean. Several dives in the submarine *Rémora 2000* to depths of almost 500 metres have enabled totally original footage to be captured of this colossal, albeit invisible pollution.

Find out more on: www.plasticoceans.net

COMEX JOINS THE FRENCH MARITIME CLUSTER



Founded in 2006, the Cluster's stated aim is to create new co-operation - 'synergy' - among French companies in the maritime sector. It stages annual marine economy forums.

Comex has always been strongly concerned with forming networks of specialist professionals. Now Comex has just joined the *Cluster Maritime Français* (see www.cluster-maritime.fr for an English version of the CMS's aims and achievements). The Cluster was founded early in 2006 to promote the French maritime economy, from coastal fisheries to international sea transport, by way of the offshore oil industry, shipbuilding, marine engineering and maritime insurance.

The CMS came into being at the instigation of private organisations active in the maritime world. While retaining its independence, it receives support from

the *Institut Français de la Mer*, the French Institute of the Sea, with which it works closely. There are no public bodies among the members, with the notable exception of the French Navy, which remains a very big - and ultra-specialised - French ship-owner. The Cluster started with about 30 companies. Now, five years later, there are almost 250 members, including Comex. According to Francis Vallat, their President, the Cluster started off with the idea of 'making French maritime businesses more efficient by encouraging them to work together, and to stimulate maritime trades and professions'. With this in mind the CMF devotes a large slice of its knowhow to lobbying -

without a hint of bribery! - on behalf of French maritime institutions, asking for be given a greater role on the world stage. With this in mind the CMF stages marine economy forums - *les Assises de l'Economie Maritime*, which in 2011 became the biggest professional maritime gathering in Europe, with 4000 managers attending as speakers or audience.

Not a lot of people know that, but the maritime sector constitutes a bulwark of the French economy. With over 300,000 jobs and an annual turnover of 52 billion euros - and that is without counting harbour activities and tourism both onshore and at sea - the maritime sector is bigger than the car industry.



During the campaign of 2011, Natalie Tesche-Ricciardi breaks the record for the longest dive by a woman in the submarine *Rémora 2000*.

First-Ever Underwater Film Shoot in 3D with *Tesche Dokumentarfilm*

Once more the oceanographic craft *Minibex*, the two-seated submarine *Rémora 2000* and the ROV [Remotely Operated Vehicle] *Super-Achille* have provided equipment, and served as décor for the film crew of the German documentary producer Sigurd Tesche. Tesche and Comex have been working closely together for more than 20 years. Two films were shot during their last joint exercise during summer 2011. The first film is a documentary about the cold-water corals of which several hundred have been discovered on the slopes of the Lacoze-Duthier underwater canyon off the Côte Vermeille (Pyrénées-Orientales, France), where Comex has already conducted several dives for the *Agence des Aires Marines Protégées* (AAMP), a body dedicated to the preservation of marine environments. The footage obtained during this expedition for the *Tesche Dokumentar-film* production company will be used in a film about these distinctive corals, which were recently discovered in the north and south Atlantic, as well as in the Mediterranean. The film will be broadcasted on Arte, the Franco-German channel, in the spring of 2012. The second documentary, which was also filmed during the summer of 2011, will be a landmark for both organisations, because it uses, for the very first time, a 3D camera under the sea. This camera was set up on the ROV *Super Achille*. It made possible some spectacular and totally original footage on the way fish behave. With the exception of James Cameron, who produced *Abyss* and *Titanic*, Sigurd Tesche is the first film-maker to deploy such a camera beneath the surface of the water. The documentary producer explained, 'This camera had to undergo modifications once or twice in the course of the expedition; and here the help of the amazing technicians that Comex deploys on *Minibex* was invaluable. They are the ones that made the whole thing possible.' Since the first time *Tesche Dokumentarfilm* and Comex first collaborated in 1990, the film team and the ship's crew have always worked together to obtain excellent results, despite their two totally different fields of expertise. To mark Comex's fiftieth anniversary, Sigurd Tesche was eager to pay tribute to Henri Germain Delauze and to his organisation, through a few recollections of their long years of working together. 'When I met him at his home for the first time, in 1989,' Tesche recalls, 'it took just two hours of conversation to know that without him I could not possibly make the series of films about the Mediterranean that I was planning to shoot. I was immediately won over by his incredible enthusiasm, his intelligence, the abundance of new ideas that generated spontaneously in his mind, and his absolute conviction that nothing was impossible. 'The following summer,' continues Tesche, 'we went off for four weeks in the *Minibex*, with the first single-seater *Remora* and an *Achille* ROV, to shoot a series of eight films. I never doubted that we would succeed, because the moment I saw them at Marseilles, I knew immediately that this vessel and her crew could deliver exactly what we needed for this movie project. And that is precisely what transpired.'

Twenty-two years later, this fruitful Franco-German co-operation still continues with just as much enjoyment and success for both men. And their friendship deepens with every new venture.

Book Review

Le Têtard vide son sac, (literally, *The Tadpole Empties his Bag*) by Gabriel Di Domenico

Gabriel di Domenico is a former Comex diver who has worked on undersea projects all over the world and who has always stood out from the crowd in the microcosm that is industrial diving. He is a loudmouth and a loyal friend who in the course of his long and amazingly varied career has taken some outrageous gambles – and won.



One of these gambles is writing. For fifteen years or more he has been carving out a reputation for himself with books of reminiscences, each more incredible than the last. An ancient wreck needs its contents spirited away discreetly. A dictator is assassinated, and his grieving family want to bring home the great man's body – together with the diamonds he was carrying. A sunken yacht needs to be located at the bottom of the sea.

Gabriel Di Domenico, alias Gaby, alias Dido, alias The Tadpole, has never needed persuading to try stunts like these, as much to make a grand gesture as for the wads of money he could earn. In his latest work, Gaby keeps his promises yet again. He empties his bag, and a load of good things come out. Nobody who has crossed his path is likely ever to forget him.

Le Têtard vide son sac, de Gabriel Di Domenico. Published by *L'Ancre de Marine*. 250 pages. 20 €

Pilleurs d'amphores [The Amphora Looters], by Gérard et Dany Loridon

Professional diver Gérard Loridon is the author of many works about diving and the real-life characters who work on and under the sea. Now he has turned his hand to fiction and the beautiful illustrations of Dany Loridon enhance his thoughtful, spirited narrative.



When Gérard sets out to write a story, real life is emphatically not far away. With *The Amphora Looters*, his latest book, he retells, in a lively, terse style, one of the most prevalent tales along the Mediterranean coast: the hunters for ancient treasures under the sea, the game of hide and seek they play with the police and the inevitably staggering sums they amass from this illicit and idiosyncratic trade. Pure fiction? It is a matter of opinion...

Pilleurs d'amphores, by Gérard et Dany Loridon. Published by *Les Presses du Midi*. 120 pages - 15 €

Un conquérant sous la mer, (literally, *A Conqueror Under the Sea*) by Alain Dunoyer de Ségonzac

This book is the seminal work on the history of Comex and the life of its chief, Henri Germain Delauze. It was written 20 or so years ago by journalist Alain Dunoyer de Ségonzac, an acknowledged expert in matters marine and oceanographic. Comex's founder and president had previously turned away many would-be biographers eager to immortalise the meteoric rise of this captain of industry and pioneer of deep diving. In the early 1990s, won over by the enthusiasm of Alain Dunoyer de Ségonzac, Henri Germain Delauze finally agreed to co-operate.



The author spent many hours interviewing the founding president of Comex and the book came out at the end of 1992, the year in which Comex downsized by parting with its biggest subsidiary. Twenty years later, *Un conquérant sous la mer* has lost none of its documentary value and is still the most complete and the most accurate of the works about Comex and the man who created it. The only drawback: copies of this book are becoming hard to find.

Un conquérant sous la mer – Henri Germain Delauze, by Alain Dunoyer de Ségonzac. Published by *Buchet-Chastel*. 222 pages.

THE DEEP DIVE WATCH

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