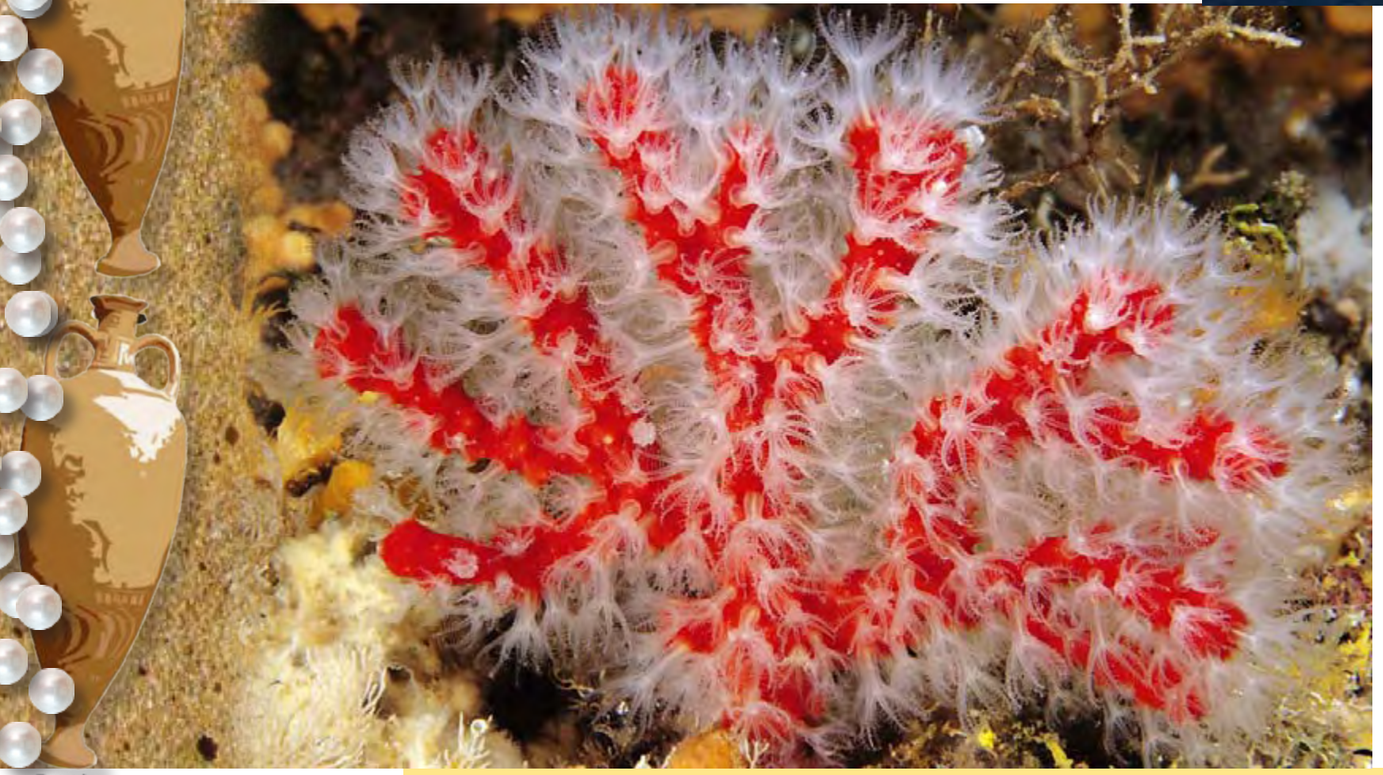
pearls of the mediterranean

The picturesque little port town of Komiza is the home of the Manta Diving Centre

Vis

Tito's bastion

Text by Harald Apelt and Wolfgang Pölzer
Photos by Wolfgang Pölzer



If there is any hidden secret in the Mediterranean, it is the island of Vis. For many years, it was a forbidden and restricted military area. It was not until 1991, when the iron curtain finally came down, that it was opened up for tourism and diving. On Vis, small picturesque port towns and spectacular wrecks, drop-offs and caverns are waiting to be discovered by divers.

The drop-off

Although I have had several hundreds of dives in Croatia, I have never seen a drop-off like this before. It is not just the vertical fall into the deep blue, but the unbelievable natural growth that impressed me. Between the numerous red fan corals, I spotted what I first thought were other bright corals and bushes.

The precious red coral can be discovered even in depths that can be reached by scuba divers

From a distance, they just looked like a yellow variety of a gorgonian, but as I got closer, the real secret of this drop-off revealed itself in the beam of my lamp. The remarkable growths in front of me were black corals, a very rare species of cnidarian in the Mediterranean.

Scientists assume that these beautifully coloured polyp colonies can reach the age of 1,800 years, and as such, are one of the longest living sea creatures in the world. Inspired, I began to position my lights. These corals were not only scientifically interesting, but also a beautiful photo subject.

Some minutes later, our dive guide Lorenz signalled us onwards. He wanted to show us a grotto full of red corals. And indeed, not far from the yellow corals, a cavern entrance big enough to contain three divers, opened up a few meters into the rock. Unbelievable, but true, the ceiling of the cavern was completely covered with precious red corals. As the bubbles from our exhalations rose to the ceiling and brushed against the furry white polyps, they retracted, leaving their fire red skeletons naked and exposed. For thousands of years,

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they have served as raw materials for making jewellery. These growths remind me of gnarly fingers, as they stick 10 cms out of the ceiling.

After a couple of quick shots, it was time to start our ascent. In shallow water, we had a final glide through the spacious tunnel before being picked up by Lorenz Marovic's dive boat.

Coral diver

This Croatian, who is also fluent in English, has constructed his vessel from the bottom up. Marovic's boat design includes a large dive deck and a decompression chamber, which is included not only as a matter of safety, but also to support Marovic's professional as a commercial coral diver. In Croatia, Marovic is one of just a dozen who are licensed to harvest and sell genuine red coral.

The biggest specimens that we saw on our last dive could possibly bring in 200 Euros, which is, however, hardly worth considering. "Real" red corals would bring in ten times as much, but you would have to go to twice the depth to find them.

But we do not have much time to listen to Marovic's tales of his work as a commercial diver. Aniska, his wife and able helmsman, has swiftly brought the speedy dive boat back to their dive centre, which they run together.

Island history

We are on the small Croatian island of Vis, which is located on the Dalmatian coast not far from the Italian border and about 45 km off the main coast. This strategically important position has secured Vis a place in history books, not always for the better.

In the 4th century B.C., Vis became the first Greek colony in the Eastern Adriatic. In a short time span, the island developed into a prosperous democratic city-state and an important centre of commerce, which soon founded its own colonies. It wasn't until several centuries later, during the 7th and 8th centuries AD, that the Croatians arrived on the island, where they mixed with the existing population of Greek and Roman origin. The original name of the island, Issa, was soon "Croatiafied" to Vis.

ABOVE: One of the colourful drop-offs covered with colour changing gorgones and the rare black corals. INSET RIGHT: "Iaaaahhhh": Stubborn mule, but historically, the most reliable transportation mode in the pathless hills

Josip Broz Tito

Josip Broz Tito

Josip Broz Tito was the leader of the Socialist Federal Republic of Yugoslavia from 1945 until his death in 1980.

During World War II, Tito organized the anti-fascist resistance movement known as the Yugoslav Partisans. Tito was the most prominent leader of the Anti-Fascist Council of National Liberation of Yugoslavia (AVNOJ), which in 1943 established the basis for post-war organisation of the country, making it a federation. In Jajce, Tito was named President of the National Committee of Liberation. On December 4, 1943, while most of the country was still occupied by the Axis, Tito proclaimed a provisional democratic Yugoslav government.

After Tito's communist partisans stood up to intense Axis attacks between January and June 1943, Allied leaders switched their support to the partisans. King Peter II of Yugoslavia, American President Franklin Roosevelt and British Prime Minister Winston Churchill joined Soviet dictator Joseph Stalin in officially recognizing Tito and his partisans at the Tehran Conference. This resulted in Allied aid being parachuted behind Axis lines to assist the partisans. The Balkan Air Force was formed in June 1944 to control operations that were mainly aimed at helping his forces.

On 5 April 1945, Tito signed an agreement with the USSR allowing "temporary entry of Soviet troops into Yugoslav territory". Aided by the Red Army, the partisans won the war for liberation in 1945. At the end of the war, all external forces were ordered off Yugoslav soil after the end of hostilities in Europe. Later, he was a founding member of Cominform, but resisted Soviet influence, and became one of the founders and promoters of the Non-Aligned Movement. He died on May 4, 1980, in Ljubljana. SOURCE: WIKIPEDIA ■

Harvest: A Vis farmer brings in heavy grapes for the tasteful Vis wine "Plavac Mali"

Tito's Bastion

It was not until the Croatians arrived on the island that it became an important navy base in the Eastern Adriatic. Countless bloody battles and changes of power took place here, and later, during World War II, it regained its strategic importance. Vis became a base for Allied Air Forces and Navies, and was, at one time, also the headquarters for the staff of commander Josip Broz, more famously known as Tito, and later, as president of Yugoslavia.

Its unique location as a strategic stronghold and outpost in the Adriatic unavoidably made Vis part of the war. Even 45 years after the war, most of the inhabitants were military personnel. For this reason, the island has been completely off-limits for foreign tourists. No investments in infrastructure or tourism were made on the island, since only the needs of the Army and the few inhabitants of the island were accommodated. The only factory on the island was a small textile manufacturer, which supplied the military.

It was not until the 1970's when two hotels,

Lorenz Marovic inspects the results of an extended dive for red corals

Red Coral Jewelry

In jewellery, it is corals such as *Corallium rubrum* and *Corallium japonicum* that are used. The unprocessed hard skeleton of red coral branches is naturally matte, but can be polished to a glassy beautiful shine.

Red corals resemble small leafless bushes up to a meter tall. Their valuable skeletons are composed of intermeshed spicules of hard calcium carbonate, coloured in shades of red by carotenoid pigment.

Even if red is thought of as their typical colour, corals come in a wide range of colours from red to white and from blue and brown to black. The most popular are the red hues from pale pink, or salmon, to a deep dark red. Black corals and gold corals are very much in fashion, whilst the blue ones are extremely rare. The white of the angel skin coral, suffused with pink, is regarded as particularly precious. Other well known colours are the rich red Japanese Moro coral, the pale pink "Boke" and the red "Sardegna".

Red corals grow on rocky sea bottom with low sedimentation, typically in dark environments, either in the depths or in dark caverns or crevices and have traditionally been brought up from the depths with trawl nets. However, since first-class corals have now become rather rare as the shallower of these habitats have been largely depleted by harvesting, divers are now deployed, in a less destructive process, which involves divers going down and harvesting the sensitive coral branches. After that, the branches are cleaned, sorted and processed by means of saws, knives, files or drills. Coral is not usually ground or cut on a wheel.

It is often porous, full of holes or cracked, and in these cases it is of lesser quality. Coral of that kind is sometimes filled with coloured wax to improve its appearance. High-quality coral is of an even colour and free of cracks, blotches, striations and holes. Since genuine untreated coral is rare, it does fetch good prices. For that reason, anyone being offered what appears to be high-quality coral cheaply should be sceptical. The best thing to do is to purchase one's high-quality coral jewellery from a reputable merchant.

Like the pearls, these are also organic jewellery materials. It certainly is an interesting fact that both of these are products of the water, chemically closely related with each other. Both consist of more than 90 percent calcium carbonate. And it really is a miraculous thing that nature has created both the scarlet coral and the pearl from the same, unprepossessing raw material.

On the one hand, corals are not particularly sensitive, but with a hardness of only 3.5, they are much softer than any other gemstone material. Their beauty can easily be impaired by the wrong treatment with, for example, cosmetics, hot water or bright light. Coral jewellery should be kept in a safe place, and from time to time, cleaned with a soft, damp towel. If the surface of the coral does get scratched, the jeweller can have it repolished. ■

Endangered or not

Red coral has been widely sought after since ancient times to supply a prosperous jewel industry, but over-harvesting of the deep-dwelling, commercial populations of this slow-growing, long-lived species has led to drastic reductions in the size of harvested colonies and has depressed the regeneration of the commercial banks. Red coral, however, is not an endangered species as such, due to the wide distribution of small, non-commercial colonies spread out over numerous predominantly coastal reproductive populations. ■

A really lovely Mediterranean port town: Vis is the capital of the island of Vis

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one in Vis and one in Komiza, were built to stimulate a bit of tourism on the island. But because only domestic Yugoslavian tourists were permitted to go, it was all just an exercise in futility. The only enterprises that really functioned were the ancient wine growing and fishing industries.

A virgin island

When the military finally evacuated island in 1991 and the long-standing travel restrictions were lifted, Vis was a virgin destination. Even to this day, more than 17 years later, the island retains its original charm.

There are only a limited number of hotel beds on the island, of which most are private bed and breakfasts. So, even in the high season, Vis hasn't got more than 4000 inhabitants and will not turn into a tourist hell like so many other places in the region.

A majority of the few guests that visit the island are Italians, who arrive by ferry from the ports of Ancona and Pescara on the opposite coast of the Adriatic.

Divers' paradise

From a diver's point of view, we can thank the military for hiding these little secrets for so many years. Long stretches of coastline and the surrounding archipelago have hardly been dived at all. The impressive cover of marine life, as well as the many wrecks and caves that lie further north, put the more famous dive sites in the Northern Adriatic to shame.

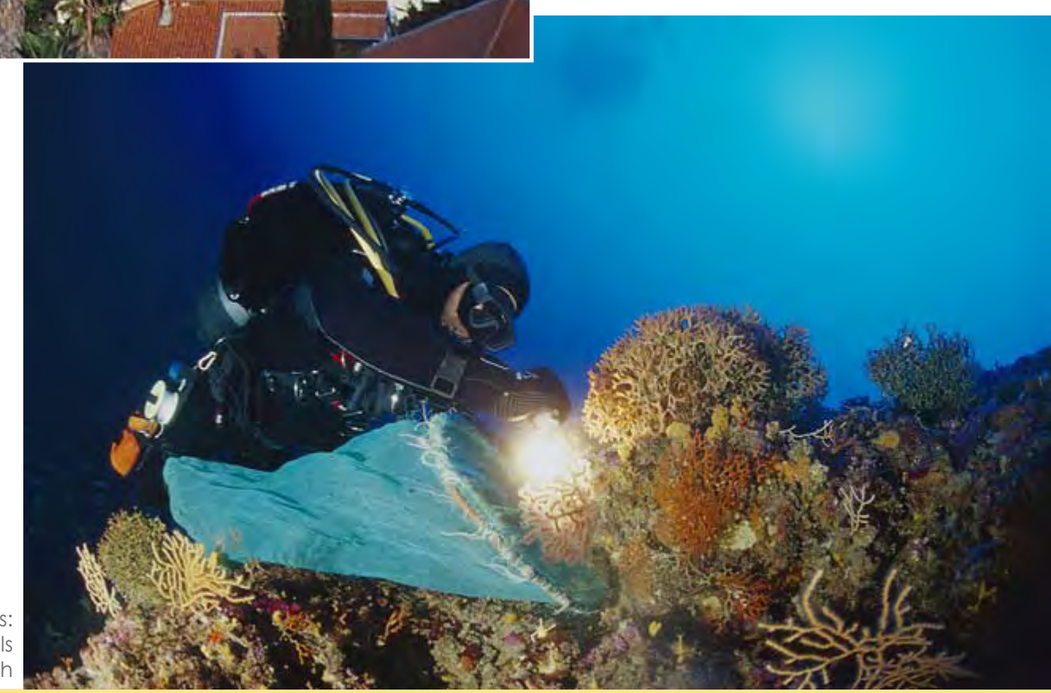
Under the huge gorgonians, you can find red corals of considerable size, even at air diving depths. It appears that the years during which the island was off-limits have protected and preserved Vis in a historic time capsule. Independent of Croatian dive regulations that were enforced in more recent years, Vis has already been using licensed dive guides for six years. Thanks to this diligence, underwater archeological artefacts, which date all the way back to ancient Greek and Roman eras, have remained largely intact.

What you see topside on Vis is also quite attractive, thanks in large part to the artesian wells under the island, which provide a plentiful supply of freshwater that makes the island one of greenest in the entire Adriatic.

Apart from the typical Mediterranean vegetation, wine also seems to favour the sandy soils of the island. From their grapes, a full-bodied red-wine, the "Plavac mali" is produced. This wine will please the palate of any discerning visitor with an interest in wine. Add some grilled fish, fresh out the ocean, or a lamb chop with some potatoes and rosemary, and what more can you ask for?

The five best dive spots

Blue Grotto. A very impressive cave, which is not to be confused with its more famous name sake on the island of Capri. From the little island of Bisevo in front of Vis, you either swim or dive through a narrow tunnel in shallow water. After a few meters, you will arrive in an expansive hall,



Professional diving in extended ranges: Lorenz Marovic harvesting red corals at 70 meters of depth

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LEFT: The wreck of the Greek freight ship *Vassilios T* can be discovered in a depth between 20 meters and 55 meters. The ship was transporting coal when on the night of March 19th, 1939, it hit the rocks of "Cape Stupisce" outside of Komiza. RIGHT: A diver investigates some black coral

which stretches out before the visitor. It seems possible to enter only through this entirely submerged, but huge entrance, which is illuminated by reflected sunlight from above, which paints the ceiling of the huge vault blue. Past a ridge of rocks and some other weird formations, it is possible to reach the bottom of the cave at a depth of 20 meters. Right after that, a drop-off follows.

Teti Wreck. A partially well-preserved shipwreck in 7 to 35 meters depth that is easy to dive. The 70-meter long Italian freighter wrecked on the northern coast in 1930 after running aground due to a navigational error. The bow is completely destroyed. The wreck is erect, resting at an angled slope, with the stern covered by beautiful coral growth. The steering wheel is an excellent photo subject. Quite often, you will see conger eels on the wreck.

Vassilios Wreck. Resting on its port side off the northern coast of Vis, this 104-meter long Greek freighter remains in an excellent state of preservation. Laden with coal, it ran aground under mysterious circumstances on the night of March 18th, 1939. Since no one was injured, it was suspected that it was intentional, and probably a case of insurance fraud.

The bow and gigantic anchor are the shallowest and easiest part to dive. The stern, with the richly encrusted propellor and rudder, should only be visited by experienced and appropriately trained divers, since it is located at a depth of 55 meters.

Totac. A fantastic and richly overgrown drop-off that extends down to great depths. It measures up to anything that you could see in the tropics. A rocky ridge runs from the island and seems to disappear in the bottomless clear blue abyss. The region of about 30 to 40 meters of depth seems to be covered with red and yellow gorgonians and countless cup corals. There are small caves in which it is possible to see red corals. Stately langusters are everywhere. In shallow water, there is another cave to tempt divers.

Seal's Cave. An extensive, yet uncomplicated, cave to dive on the island of Bisevo. It is named after the colony of monk seals that, until a few years ago, took up residence in the rear of the cave. Here, it is possible to exit onto the beach, which was once the peaceful refuge of the seals. Aside from incredible visibility, it is also possible to locate rare creatures such as orange cleaner shrimps and porcelain snails.

This trip was supported by Manta Diving Centre. ■

The cowrie shell looks beautiful but is—besides human beings—the most dangerous enemy of the red corals.
BELOW: Drop-off walls are brightly covered with red gorgones

The Treaty of Vis

Edited by Catherine GS Lim

Vis is a small Croatian island in the Adriatic Sea, measuring roughly 90.3 square kilometres. Its highest peak stands at 587 metres high, and oversees about 5,000 citizens living in two towns and several smaller settlements.

It is your typical idyllic Mediterranean isle, complete with clear blue seas, sunken wrecks and unique marine creatures just waiting to pop up in your viewfinder.

One wonders what the scene was like on 16 June 1944, during the second world war, when this isle became the venue of the signing of the Treaty of Vis. This historic agreement was an attempt at a merger between the exiled Yugoslav government (represented by Ivan Šubašić) and the Communist-led partisans who fought against the occupation of Yugoslavia (represented by Josip Broz Tito) The treaty became known as the Tito-Šubašić Agreement.

Despite the signing, the new government that would have resulted was not formed until more than four months later, on November 2nd, with the signing of the Belgrade Agreement. This brought an interim government into the picture, effective until post-war democratic elections could take place. At least, this was what Winston Churchill had in mind when he supported the Agreement.

In reality, although Tito led a coalition government and Šubašić became its foreign minister, the real power was in the hands of the Communist-led Anti-Fascist Council of Yugoslavia.

It was only in the following year, in the autumn that the Treaty became void, following elections held by the Communists. Following a communist victory at the polls, Šubašić and other officials stepped down in October.

On 29 November 1945, while he was still in exile and after a questionable referendum, Peter II was deposed by Yugoslavia's Communist Constituent Assembly of the "Anti-Fascist Council of National Liberation of Yugoslavia" (Antifašističko V(ij)eće Narodnog Oslobođenja Jugoslavije, or AVNOJ). On the same day, the Federal People's Republic of Yugoslavia was established as a socialist state during the first meeting of the Communist-led Parliament in Belgrade. Josip Broz Tito was named Prime Minister.

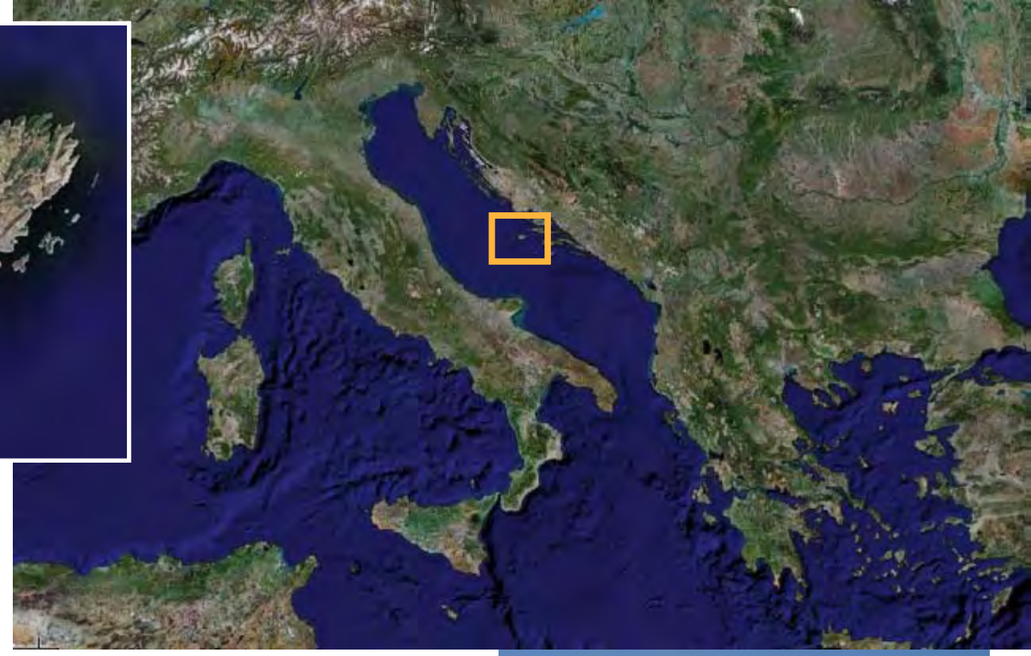
The official Yugoslav post-war estimate of victims in Yugoslavia during World War II is 1,704,000. Subsequent data gathering in the 1980s by historians Vladimir Žerjavić (Croatian) and Bogoljub Kočović (Serb) showed that the actual number of dead was about one million. ■

fact file

Croatia

SOURCE: HARALD APELT, CIA WORLD FACT BOOK

Croatia's coat-of-arms



ABOVE: The island of Vis. RIGHT: Regional map with location of Vis

History Up to the close of World War I, the lands that comprise Croatia today were part of the Austro-Hungarian Empire. In 1918, a kingdom was formed by the Croats, Serbs, and Slovenes, which became known as Yugoslavia after 1929. The country became a federal independent Communist state after WWII, under the strong leadership of Marshal Tito. In 1991, Croatia declared its independence from Yugoslavia, but it took four more years to be realized. These years were marked by sporadic and bitter fighting between Croats and the occupying Serb armies. In 1998, the UN supervised the return of the last Serb-held enclave in eastern Slovenia to Croatia. Government: presidential/parliamentary democracy. Capital: Zagreb

Geography Croatia is located in southeastern Europe. It borders the Adriatic Sea, between Bosnia and Herzegovina and Slovenia. Strategic location: Croatia controls most land routes from Western Europe to the Aegean Sea and Turkish Straits; Off the coast of Croatia lie a vast majority of the Adriatic Sea islands, which are made up of 1,200 islands, islets, rocks and ridges. Coastline: 5,835 km combines 1,777 km of the mainland and 4,058 km of the islands. The terrain of Croatia is geographically diverse. Along the Hungarian border are flat plains; near the Adriatic coastline and islands are low mountains and highlands. Lowest point: Adriatic Sea 0 m. Highest point: Dinara 1,830 m. Natural hazards: destructive earthquakes.

Climate Croatia has both Mediterranean and continental climate with predominately hot summers and cold winters inland and dry summers and mild winters along the coast.

Environmental issues forests are being damaged by air pollution from metallurgical plants and its resulting acid rain; industrial and domestic waste is causing coastal pollution; civil strife between 1992-95 led to the need for land mine removal and reconstruction of infrastructure. Croatia is party to these agreements: Air Pollution, Air Pollution-Sulfur 94, Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling. Agreements signed, but not ratified: Air Pollution-Persistent Organic Pollutants, Climate Change-Kyoto Protocol

Population 4,493,312 (July 2007 estimate). Ethnic groups: Croat 89.6%, Serb 4.5%, other groups 5.9%—including Bosniak, Hungarian, Slovene, Czech, and Roma (2001 census). Religions: Roman Catholic 87.8%, Orthodox 4.4%, other Christian religions 0.4%, Muslim 1.3%, other religions 0.9%, those with no religion 5.2% (2001 census). Internet users: 1.576 million (2006)

Languages Croatian 96.1%, Serbian 1%, other and undesignated languages 2.9%—include Italian, Hungarian, Czech, Slovak, and German (2001 census)

Currency kuna (HRK). Exchange rates: 1EUR=7.2HRK, 1USD=4.6HRK, 1GBP=9HRK, 1AUD=4.26HRK, 1SGD=3.38HRK

Travel by car or plane to Split: During summertime there are good ferry connections from Split via Hvar to Vis. The transfer takes about two hours. Price (car + 2 persons): € 35. Time tables are available at www.jadrolinija.hr
Entry to Croatia with passport (valid for six months) or identity card for EG-members.

Best time to visit The climate on the island of Vis is milder than at the coastline. In summertime, temperatures are about two degrees lower, and in winter, two degrees higher than at the Croatian coast. Season starts in beginning of May and runs until the end of September.

Accommodation During the high season, it is difficult to get transfer tickets and accommodations. There are only a few small hotels on the island (three in Vis, one in Komiza). But there are some more private rooms and apartments available, which can be booked through the diving centres or at the tourist agency, Darlic & Darlic: tel. 00385-21-717 205 www.darlic-travel.hr

Diving The underwater scenery around Vis is diversified and offers all that scuba divers and experienced tech divers are looking for: colourful drop-off's, caverns, grottos and wrecks. Good visibility is one of the big advantages of this Mediterranean region. Most of the year, a 5-7 mm wetsuit is suitable; only in the beginning of the dive season is a drysuit more comfortable. There are four dive centres on Vis:

Manta Diving, Komiza
www.manta-diving.com
Issa Diving Centre, Komiza
www.diving.hr/idc
Diving Centre ANMA, Vis
www.anma.hr
Dodoro Diving, Vis
www.dodoro-diving.com

Deco Chamber
The Manta Diving Centre has its own decompression chamber on board the dive boat. The next big decompression chamber is at Split. Transportation via speedboat or helicopter. ■

Boats in the harbour at Komiza

Column by Cedric Verdier

Dealing with Fitness Training for Technical Divers

By Cedric Verdier,

BAFA, International Fitness Association Instructor, IFA Sport Nutritionist

There is no such thing as safe technical rebreather diving without proper preparation. But preparation means much more than just checking equipment, going through dive planning and "What-ifs". It is also a matter of long-term preparation.

Just think about how strenuous a technical dive could be and how it impacts your body. You carry tons of tanks, cases, bags and equipment, travel for hours in an uncomfortable position, gear up with a dry suit under a tropical sun, and wait long minutes before being able to jump in the water. And this is just the beginning of the stress you are going to put your body through. You still have to swim to go down, swim on the bottom, swim to go up, on-gas, off-gas, fight against the current and drag off your deco tanks, your bailout tank(s), your huge twinset (the one you nicknamed Potemkin!) or your favourite rebreather, swim at the surface, climb the ladder or the shore and carry everything again! And some people think we do that just for fun! Needless to say, preparing for these kinds of dives goes beyond just resting the evening before the dive and drinking a so-called energy drink a few minutes before kitting up. It takes year-round preparation. Moreover, it's a lifestyle!

The benefits of fitness training

A better cardiovascular system means a lot for your body. It doesn't only improve your dives but also your general health. Some studies show that there is a relationship between VO_2max (your maximal O_2 consumption, i.e. the ability of your body to efficiently transport and use the O_2 in your lungs) and risks of Decompression Sickness. And a better use of the oxygen means a better/slower ventilation. You are less exerted if you have to swim for a long time, or harder than usual, and it becomes easier for your body to get rid of the CO_2 you produce.

The Body Mass Index (BMI) is a way to determine the ratio between fat tissues and muscles in your body, based on your age. A lower BMI has the following significance for a rebreather diver:

- Less fat and more muscles is a good way to decrease your susceptibility to DCS. Because of a higher vascularisation, muscles tend to be less prone to DCS than poorly perfused fat tissues.
- Muscles are heavier and less buoyant than fat tissues (1.10gr/cm3 for muscles and only 0.90 gr/cm3 for fat tissues). So, a lower BMI means a less buoyant body, which in turn means a lesser need for weights, something that all divers should appreciate. And with less weight, rebreather divers have usually a better trim.
- More muscles also mean more strength, something that can prove to be useful in case of an unexpected situation (fighting against a strong current, holding on a shotline, etc.) or an emergency (helping another diver to surface, rescuing a diver and removing him/her from the water, etc).

The Body Mass Index can be calculated by different complex equations based on the skin thickness, or more simply, with modern digital scales. Obesity is when your BMI is

Fitness Training

over 20 percent, if you are under 35 years of age (31 percent for women). But if you are older than 35, then obesity only appears if your BMI is over 25 percent (37 percent for women). So, check it out on a regular basis!

More comfort

Fitness is of paramount importance for your comfort level at the surface and underwater. Before the dive it gives you more strength to carry the tanks and all your kit, noticeably reducing the pre-dive stress. It also helps you to stand up, walk and jump in the water with all the gear on. During the dive, swimming becomes less tiring and less stressful, allowing your muscles to better avoid cramps. You swim more efficiently and more relaxed, and your gas consumption (or your oxygen consumption, if you dive with a rebreather) doesn't go through the roof every time you have to swim slightly harder. After the dive, your body will be subjected to a certain level of post-dive decompression stress. But one of the most stressful events is to climb a ladder (or anything else), minutes after surfacing. Your heart has to pump faster and harder to supply blood to your muscles when you already have a peak in bubble formation in your bloodstream.

A good program

Fitness training is like so much else in life. You have to find the right balance between too much and not enough. Too much and your body becomes tired, reducing your motivation. Not enough and the results are difficult to perceive. So, no need to hurt yourself, if the only kind of physical activity you've done in the last few years was to move your giant flat screen TV from your living room to your bedroom. Better to start slowly and gradually, rather than giving up after a week.

1. Get more muscles. Which ones? The ones you use the most in diving. You don't need to become the future governor of California for that. Just slowly increase the mass of your legs, chest and back and their ability to transform into energy the nutriments they store. Between one and three times a week, go to a gym club and work out for 20 to 40 minutes. Focus on some critical muscular groups like quadriceps (the thighs), back, deltoids (shoulders) and arms. If you have enough free time to go working out several times a week, a complete circuit (all body muscles) once a week is a good idea. And never forget to spend five minutes every time to exercise your abs. They help you to keep a good posture at the surface and to stay horizontal underwater, hence avoiding back problems when you carry heavy stuff.

Improving your cardiovascular system

Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic[2] or energy-generating process. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time—about 85 percent of your maximum output, depending on your age—but is more or less stable for a long period of time. Anaerobic exercise is what happens when you need your muscles for a very short and intense period of time. Of the two forms of metabolism, aerobic is the one you use the most in diving, while you swim at the surface or underwater.

Aerobic activity has a beneficial effect on your Vital Capacity (the maximum amount of gas you can exhale from your lungs), Stroke Volume (the blood pumped by your heart at each heartbeat) and Cardiac output, and improving any of these comes with some clear benefits to a rebreather diver. The best way to train your aerobic energy production system is to use the muscular group you're supposed to use in diving. Swimming, but also running or bicycling are some of the best training methods. Practice two or three times a week, at moderate intensity but for at least 30 to 60 minutes. A heartbeat monitor can help you to adjust your intensity, following these recommendations:

Maximum heart rate = 220 – age

If you haven't done any exercise for a couple of years, keep your heart rate between 60 and 70 percent of maximum heart rate. With more training, you can slowly increase your target heart rate.

Become more flexible.

Proper stretching is an important part of any fitness program. It helps to protect your muscles, tendons, ligaments and joints. It also helps you to reach all your equipment (sling tank clips and D-rings, isolation valve on your twinset, etc) more easily. Always do a short—about five minutes—but careful and slow stretching session at the end of each aerobic training session. Go through all the main muscles and joints and gently stretch them one by one for at least 20 seconds.

Don't forget hydration and diet

A proper hydration program doesn't start a few minutes before a "big" decompression dive. You should at least increase your fluid intake 24 to 48 hours before the dive. Food is also a very important issue, as most of the people have an improper balance between the different types of nutrients: carbohydrates (glucose, or glycogen stored in the cells), lipids (fat) and proteins.

A good starting point for your daily intake is 60 percent of sugar ("slow sugars" like bread, pasta

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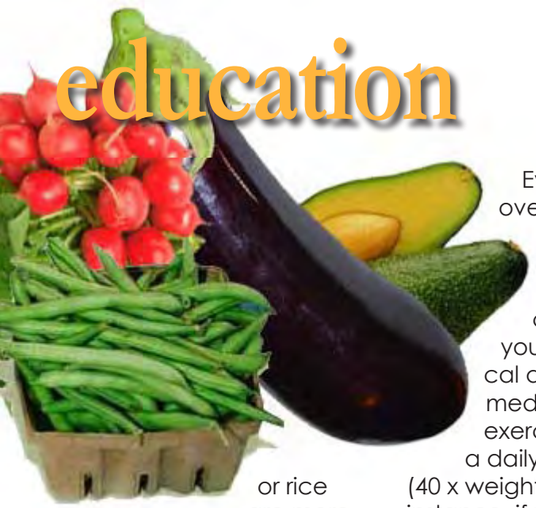

or rice are more useful than "fast sugars" like candies), 30 percent of proteins (meat, fish, cheese, milk, eggs) and 10 percent of lipids (unsaturated oils). Don't forget a large portion of fibres (salads, fruits) to help your digestion and get the necessary vitamins and minerals your body needs.

Some proteins (amino-acids) are good anti-oxydants, but physiologists are still puzzled with their ability to decrease one's susceptibility to oxygen toxicity. More proteins also actually helps to decrease your Respiratory Quotient, the ratio between oxygen metabolized (used by your body) and the CO_2 produced. A good way to decrease your CO_2 production and to save your scrubber!

Even if you feel over-weight, don't try to reduce your food intake. Just select carefully what you eat. A technical diver with a light/medium level of exercise should have a daily intake around (40 x weight) calories. For instance, if you weight 80kg, you should eat 3200 calories per day, and that's quite a lot of food. Have a look at a nutrient table to have an idea of what it is. Spread this food over three meals, according to the above 60-30-10 ratio.

A healthy lifestyle

If you committed to a fitness training program, it might be the right time to also improve your lifestyle. Quit smoking. Nicotine and 32 other components decrease your ability to properly use your alveoli for efficient gas exchange. Slow down your alcohol intake. Alcohol is as high as fat in caloric content. No chance to loose your love handles if you don't give up the 20 beers you usually drink to celebrate a good and safe deep dive. Slow down your caffeine intake. Caffeine (in tea, coffee, soda) is a stimulant of the basal metabolic rate, increasing (and after a while decreasing) blood pressure and heart rate, something you don't really need during a technical dive. And caffeine is a diuretic that increases dehydration and definitely requires a P-valve on your dry suit.

Most technical divers spend a lot of time preparing their equipment and fine-tuning their dive plan and decompression.

Just don't forget that your most important tool is not your dive gear but your body! ■

NOAA

Aboard the NOAA research vessel, *Ron Brown*, Operations Officer LT Mike Hoshlyk's duties include acting as the liaison between the scientists and the ship's crew, serving as dive master for the ship, standing in as the ship's medical officer, conducting damage control drills, and safety and lifesaving equipment maintainance. He endures long periods at sea by keeping to a daily routine. From 12-4am, Mike is on navigational bridge watch; he catches a bit of shut eye before he is on watch again from 12-4pm; he exercises a bit and then gets to do it all again the next day, seven days per week. Mike's daily fitness regime, proper hydration and diet, rest and relaxation helps him maintain a healthy outlook, focus and concentration on the job.

media

Books Film DVDs CDs

Edited by
Catherine GS Lim

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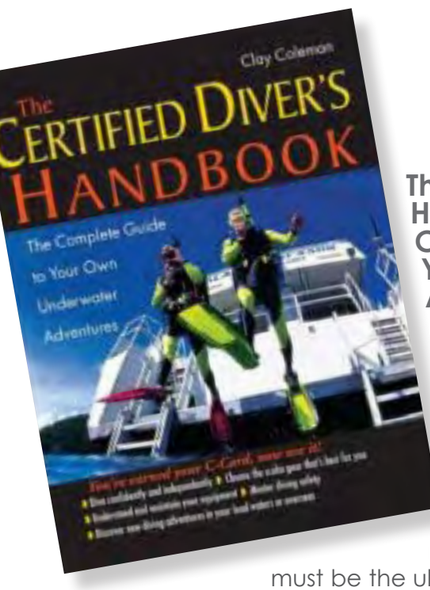
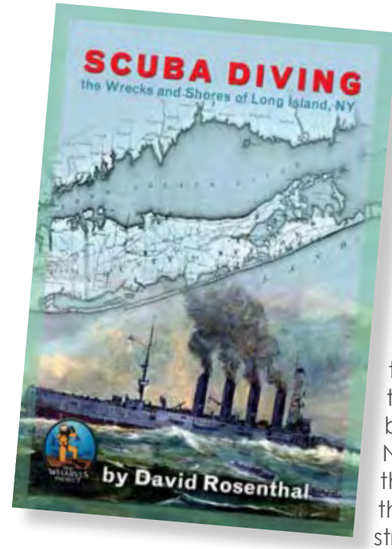


The Certified Diver's Handbook: The Complete Guide to Your Own Underwater Adventures

by Clay Coleman

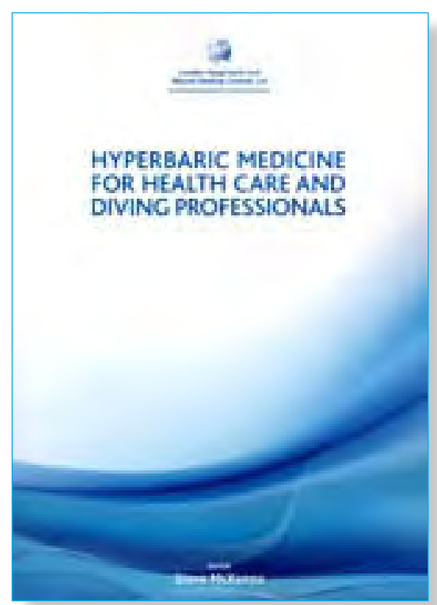
Yes, we know that this book first appeared on the bookstores way back in 1994. However, it still warrants a read from new as well as seasoned divers. The reason is simple. This book must be the ultimate how-to guide to how life should be like after receiving your C-Card. Call it a 384-page passport to your new life as a diver. This book covers the many many aspects of diving, from renting/buying equipment at the right prices, planning dives, executing dive expeditions, safety, rescue procedures, etc. Different types of dives are covered, including wreck diving, reef diving, diving at night and underwater photography. One thing that we can identify with is the fact that this book shows how one can get on a dive trip regardless of the location, budget, time of the year, and availability of your regular dive buddy. No need to confine this wonderful sport to sporadic weekend trips (too short!) and Christmas vacations (too crowded!). Author Clay Coleman shows how divers can make diving an integral part of their lives (the way it should be). As it says on the cover: "You've earned your C-Card, now use it!" Yes, we know how that feels like… ■



Scuba Diving the Wrecks and Shores of Long Island, NY

by David Rosenthal
372 pages

We admit that the waters will be cold. The currents will be strong, and alas, the visibility usually isn't much to brag about. So why dive in the waters of New York? Well, the more-than-70 stories in this book tell you precisely that. Written for the diver and non-diver, this book allows you to savour the excitement of Northeast Technical scuba diving. Indeed, the very difficulties of diving off Long Island – the variable visibility, cold temperatures and strong currents must be some of the reasons that divers continue to make the location their underwater playground. That, and the countless shipwrecks in the vicinity (some more than 500 feet long)… Writer David Rosenthal is a native New Yorker with more than 500 local dives to his name. While the stories provide sufficient adventure for the reader, there are also site maps and photos to enhance the story-telling. For the convenience of readers who want to read about specific wrecks or sites, he has added a site/equipment index in the book. ■



Hyperbaric Medicine for Health Care and Diving Professionals

Softback: 186 pages,
Aqua Press, April 2008

If your interest veers towards the medical side of diving, particularly in the area of hyperbaric medicine, then this book should somehow find its way onto your bookshelf soon. This 186-page book is a comprehensive manual covering the many aspects of hyperbaric medicine. Targeted at those who see themselves as a future Certified Hyperbaric Technologist or Certified Registered Nurse, the topics covered run the gauntlet of the regulations, chamber design and operation, environmental health, diving and hyperbaric physics, various roles of team members, fire suppression systems, patient care and management, etc. Edited by Steve McKenna, this manual incorporates the British Hyperbaric Association Core Curriculum and serves as an approved course for health care and diving professionals. ■

A Shark Documentary Made With Heart

Sharkwater
Directed by
Rod Stewart
89 minutes

"I wanted to make a film that shows sharks the way they really are, as beautiful and magnificent creatures that don't want to hurt humans, and to show how our fear has blinded us to the fact that their populations have been reduced by 90 percent over the last 50 years." —Rod Stewart, Director

To say that the filming of the documentary, *Sharkwater*, was a challenge must be the understatement of the year. Despite having never shot a video camera before, Director Rod Stewart wanted to produce a beautiful film about sharks. This promising premise turned potentially deadly as Stewart, in teaming up with conservationist Paul Watson of the Sea Shepherd Conservation Society, gets on the trail of the international sharksfin trade.

During the production, they had to contend with a pirate fishing boat in Guatemala, a gunboat chase, espionage, gangsters, corrupt legal systems and attempted murder charges, putting their lives at risk countless times.

Filming took place in 15 countries, with the majesty of the world's sharks taking centerstage. Amid the exploitation and corruption surrounding these creatures, viewers get to revel at these fascinating creatures. Watch this documentary and you'll come away in awe of the beauty of life and how our actions affect (and threaten) its tenacious balance. It's no wonder the film enjoyed a record-breaking box-office opening weekend, as well as receiving 21 international awards at film festivals worldwide. ■

media

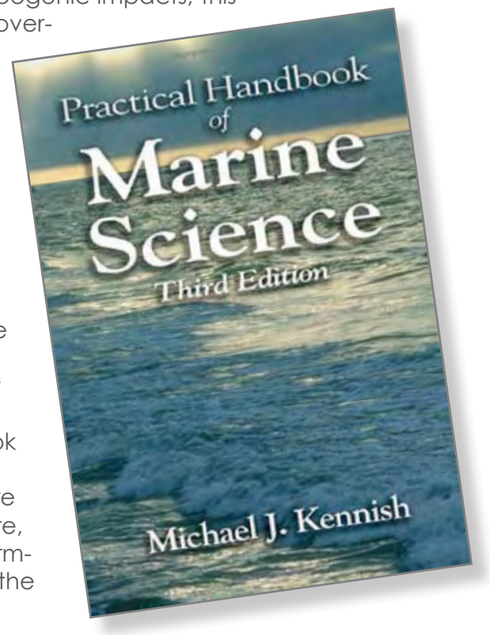
Practical Handbook of Marine Science, Third Edition

edited by Michael J Kennish
896 pages
ISBN: 0849323916

The oceans cover 71 percent of the earth's surface. The mean volume of the oceans is ~1.35 x 10^9kilometres. The mean depth of the oceans is ~3,700 metres. The Pacific Ocean is the deepest at 4,188 metres, followed by the Indian Ocean at 3,872 metres and the Atlantic Ocean at 3,844 metres.

You can find this information within the first four lines of the first page of this book's first chapter. The rest of the page practically overflows with information, and the same can be said for the remainder of this impressive volume.

Weighing in at an impressive 896 pages, this third edition is not to be taken lightly. Covering ocean physiography, marine chemistry, physical oceanography, marine geology, marine biology, and marine pollution and other anthropogenic impacts, this book offers an extensive coverage of practically all aspects of the marine environment.



With such a wide scope, this third edition takes care of the multi-disciplinary needs of anyone working in the realm of marine science and geology. With more than 800 tables and figures, this single reference does away with the hassle of heading to the library or scouring online databases every time you need to look up some obscure information. This handy guide is sure to have the info somewhere, and lets you log in some arm-strengthening exercises at the same time. ■

Diver

by Tony Groom
Seafarer Books
216 x 135mm, 336 pages
20 bw / 12 colour illustrations
ISBN: 978 1906 266 066

This book reads like an adventure novel, complete with wartime action and intrigue. It tells about the life and times of one Tony Groom, who has been diving since the age of 17 in the Royal Navy, and continued his underwater adventures as a saturation diver in civilian life.

While in the navy, Tony specialised in diving and bond disposal in the Falklands War. It was not a job for the ordinary soldier, as it required a lot of courage and steel-mindedness. The special breed of men who took upon themselves the incredible task of ensuring the safety of their comrades and civilians shared a bond that those outside their circle would never understand.

Despite this, Tony chronicles his wartime experiences in a down-to-earth, matter-of-factly sort of manner. There is no arrogance in the prose, no excessive patriotism. In other words, he tells it as it is.

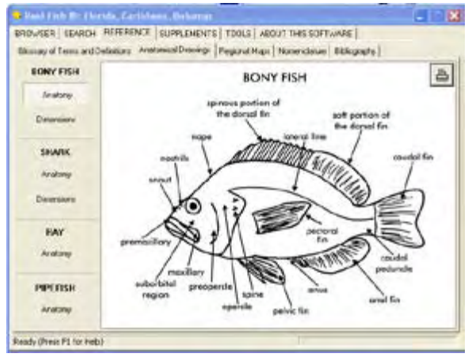
And the same goes for his life after the military, as a commercial saturation diver. Spending as many as 28 days in a diving bell isn't for everyone. Sometimes, you're on your own, sometimes you're there with five other guys living in that compact space. Yet, in the oil fields of the North Sea, the dangers that abound are no less harrowing than those found in the battlefield.

As one flips one page after another, one gains a strong respect for Tony, as well as the men who served and worked alongside him. This book is truly a page-turner, giving readers a rare (and long overdue) insight into the lives and experiences of wartime mine disposal and saturation diving, made all the more exciting and mind-boggling by the fact that the incidents in the book are true. ■

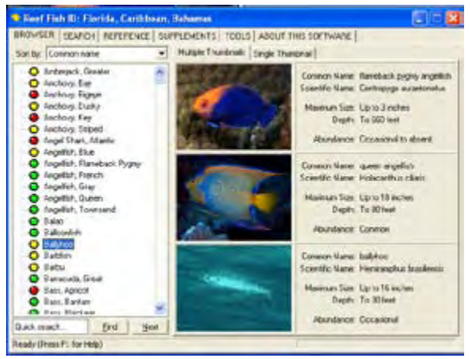
Review

Show me your fish identification, please!

By Arnold Weisz



The interactive reef fish idenfication DVD for Florida, Caribbean and the Bhamas by Canadian Reefnet is out in its fourth edition. They have put together a rather impressive package containing more than 4500 images, 1800 videoclips describing over 840 species from Florida, the Bahamas and the Caribbean. I have used a bunch of such books and CD's over the years, as "knowing your fish" is an important part of the job-description. Without hesitation, this is one of the better products. After having flipped through images, videoclips from awesome hammerhead sharks to tiny dwarf seahorses, I don't really miss the books with colour drawings that do not really match the real thing out there in the blue. Having the fish swim around in their little virtual reality ocean on your computer screen is a far better option.



With a few clicks you can have a unicorn filefish swimming around on the top right of your screen, while you take a closer look at a sketch to get to know the fellow intimitely. You can also get a lot of information about his nearest family members, where to find him and what his favourite dinner is. The small windows that pop up on your screen don't have as fancy a design as the CODIS program frequently used in CSI Miami, but they work well and fast. What they have in common is a lot of information.

Eyewitness accounts from divers are as unaccurate as from fishermen. And picking a fish out of an "mugshot" catalog, hours or days after a dive, has never been easy. If you can't go back into the ocean to round up all the suspects, use your computer. For any Underwater CSI, the search panel makes the job of looking for the "most wanted" easy. There are a wide range of search criteria, so you can narrow down the final line-up to a few choices. There are far more features in this program than I can manage to fit into this article, but I would also like to mention the articles and also the identification charts. They are all in the very handy PDF format, which means you can get nice prints. If you can't bring the laptop on your dive trip, at least you can make some prints with some of the information you would like to use. And to help you register your sightings, there is a Sighting Log.

Having heavily endorsed this product, I can't leave it without mentioning some points where improvements could be made. More images! Yes, I know not all the fantastic creatures of our oceans are readily available as models, *but*... Maybe I'm getting a bit slow sighted, but I would love another font used for the text—maybe one size larger as well. Or... I could get some spectacles! ■

For more information: www.reefnet.ca
Product: *Reef Fish Identification* (Florida – Caribbean – Bahamas), 4th edition
Publisher: Reefnet Inc.
ISBN: 978-0-9685300-7-8

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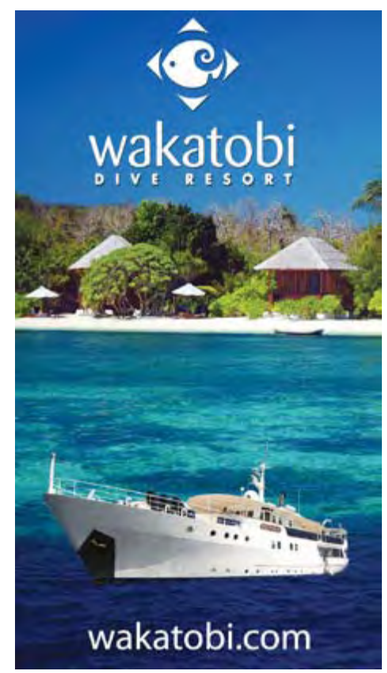
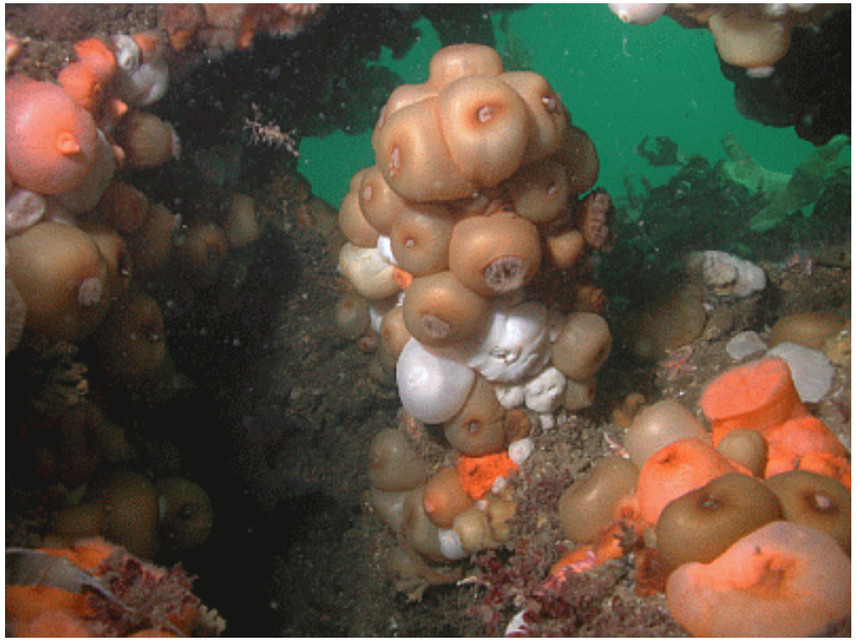


Imagine a beautiful shallow green water reef with kelp, anemones and sponges among which lots of colourful fauna darting in and out and. Now imagine that the reef is growing on some weird sandstone arches and that the water is fizzy like sparkly mineral water, with bubbles coming out of the reef structure.

Text by Peter Symes
Photos and illustrations courtesy of Hans Christian Andersen, BubblingReefs.com



The Bubbling Reefs

At first glance, from a distance, the shallow stone reefs in the shallow water off the northern peninsula of Jutland, Denmark, does not seem to be much out of the ordinary. Diving in Denmark is all right—it has it moments and decent locations, but cannot compare to the often exceptional diving that the other brethren Scandinavian countries can offer—with a few exceptions, and this is one of them.

As you get closer, you will soon realise that this location is anything but ordinary. The thriving reef is not only full of interesting macro life—in large part thanks to the marine reserve status the area enjoys—but delicate arches and pole-like structures poke out of the sand. The overgrowth of kelp and sponges gives them a furry appearance. But it is the slow fizz of bubbles coming out from the inside of these structures that gives the dive experience here a definitely surreal tint.

So, what's going on here?

The gas is methane, and what lies beneath the seabed is what you could call an oil field still in the process of forming.

The methane most likely stems from microbial decomposition of plant material deposited during the Eemian and early Weichselian periods, i.e. 100,000 to 125,000 years B.P. The gas then seeps up through the sandy seabed forming channels, or funnels, along the paths of least resistance.

As other aerobic microbes in the upper layers oxidise the methane, they turn the loose sand into solid carbonate cemented sandstone structures. It is believed that the cementation occurred in the subsurface, and that the rocks were exposed in the open by subsequent erosion of the surrounding unconsolidated sediment. In other words, the surrounding sand was later washed away by changing currents, leaving the solidified parts standing free as a sculpture garden.

These structures can be up to 500 m^2 and consist of columns up to four meters high, arches, complex formations of overlying slab-type layers, and pillars up to 4m high. The rocks support a diverse ecosystem ranging from bacteria to macroalgae and anthozoans.

Many animals live within the rocks in holes bored by sponges, polychaetes and bivalves. Within the sediments surrounding the seeps, the abundance and diversity of metazoan fauna

Distribution of 'bubbling reefs' in the northern part of the Kattegat and in the Skagerrak off Hirtshals, and gas wells in Vendsyssel and on Læsø (light area). The seeps and gas wells follow a NW-SE direction parallel to faults along the Fennoscandian border

ABOVE & RIGHT: Views of the columns that rise up from the sea floor at the bubbling reefs. Images captured and compiled from the DiveFilm Podcast Video by Hans Christian Andersen, which can be viewed at: **www.mefeedia.com**

is poor—probably due to the toxicity of the hydrogen sulphide contents in the gas.

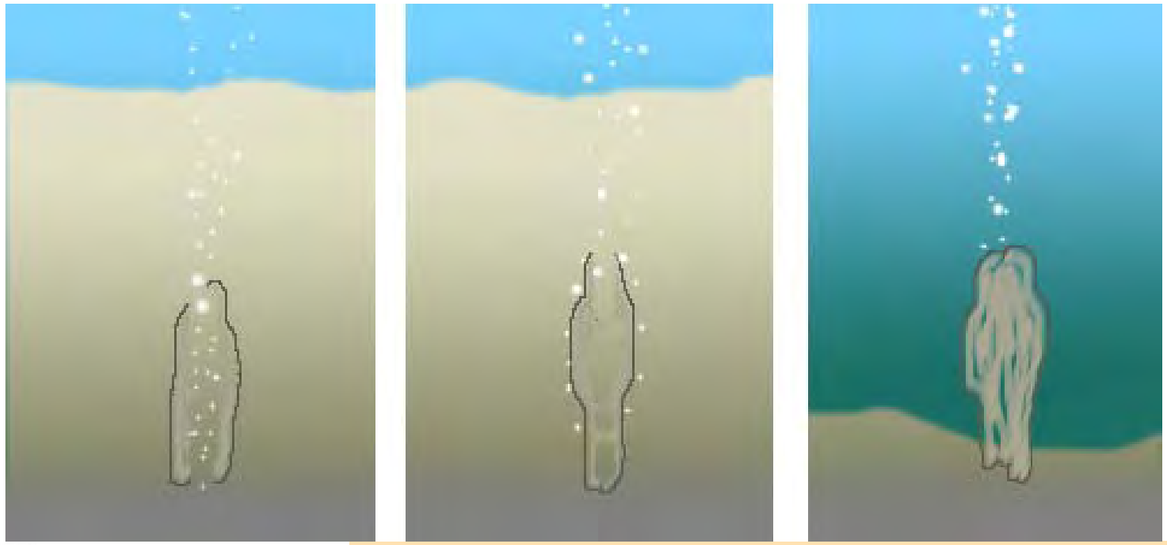
The Hirsholm islets

Hirsholmene (the Hirsholm islets) are located approximately five kilometers north-east of the port of Frederikshavn, at the tip of the Jutland pensinsula. Beside the main islet, Hirshold, there is one larger islet, Græsholm, and a group of smaller islets called, Tyvholm, Kølpen and Deget, making up about 45 hectares all together.

Only the biggest islet is inhabited, most of the time by no more than 8-10 residents though through the summer season. Yachters will visit or come over by a small ferry.

The islets are state-owned and surrounded by territorial waters. In 1929, the site was declared a Scientific Sanctuary, mainly due to the vast number of birds nesting on the islets, including a number of rare and protected species.

In 1981, the reserve was expanded to include the surrounding sea area consisting of about 2,400 hectares. The landscape is dominated by rocky embankments and banks of deposited sand and sediments along the beaches. On some of the islets, the rocks

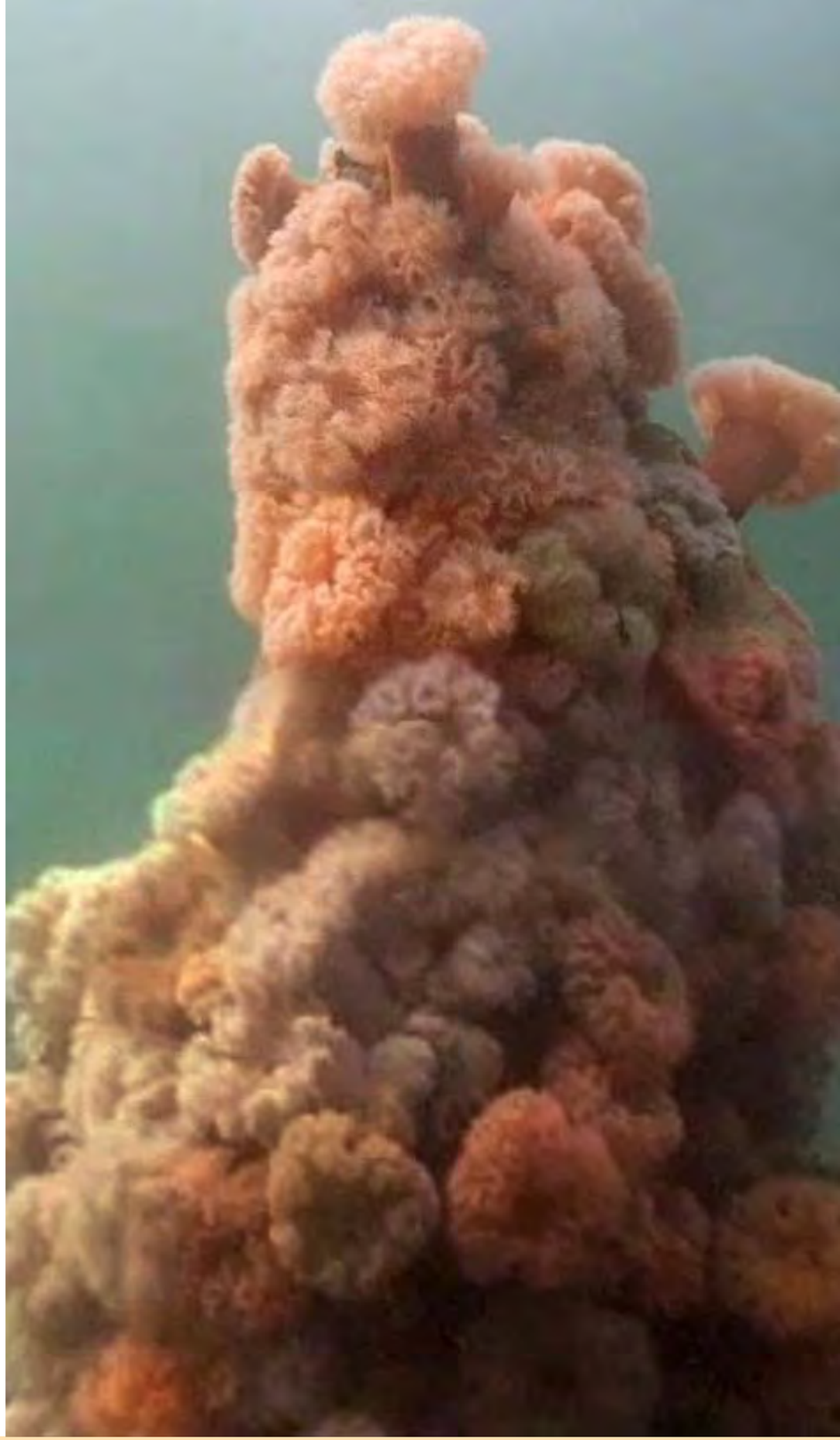


Proposed formation of a 4 m high pillar at 10 m water depth in the Kattegat:

(A) Methane-oxidation induces precipitation of carbonate, which lithifies the sediment along gas channel.

(B) Cementation of sediment fills channel and the pillar structure grows from outside.

(C) Exposure of the carbonate-cemented sandstone pillar on sea floor as a result of erosion of unconsolidated sediment; methane seepage visible in the vicinity. Erosion may have been triggered by post-glacial isostatic uplift in the Kattegat



THIS PAGE: Some of the marine life found at the bubbling reefs
ABOVE: Detail view of the spines on a starfish

ABOVE: Instead of scales, *Agonus cataphractus* is totally covered with hard bony plates aligned in lateral rows of sharp spines. It has a wide, flattened, triangular head that is over three times its body length, which is elongated and tapered. This fish can grow up to a length of 21cm

TOP LEFT: *Metridium senile* is an anemone, which varies a lot in its form and can grow up to 30cm. Its irregular base is wider than the column. Its many tentacles make a 'plume' over a parapet at the top of a smooth column when the anemone is expanded

have been covered by a thin layer of top soil formed by decomposed seaweed.

The small islets, Tyvholm and Kølpen, are almost completely barren and consist only of rocks, giving an impression of how the whole area looked in times past.

Sediment carried by currents around the islets have been deposited in some locations creating small sandy beaches, especially on the north side of Græsholm and the main Islet, Hirsholm. The site is important for marine biology research. There is a visitor centre at the site.

LEFT: *Alcyonium digitatum*, attaches itself to rocks, shells and stones in locations with storng currents and-where the normally predominent algae do not grow to abundance due to lack of light or the presence of preying crabs and gastropods. Found on the lower shore but more often sublittorally at depths of approximately 50m

Diving there

There are no regular dive trips going out there, although some of the local dive shops in Northern Denmark will occasionally put excursions to the islets on their tour programmes.

The islets are only 20-30 minutes sailing with a RIB from the main coastline, so dive clubs, or dive centres, will often launch their boats from a jetty in one of the local marinas. Diving is easy with depths ranging from only 9-12 meters, although visibility can vary from the extraordinary to pea soup. ■

CENTER INSET: One of the largest species of jellyfish, *Cyanea capillata* is commonly called the Lion's mane jellyfish because of its highly distinguishable mass of thin, long, hair-like tentacles. Growing up to 30-50cm in diameter, it is usually yellowish brown or reddish in colour

Illustration of the underwater landscape at the bubbling reefs

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Ocean Arts

Paintings & Sculptures inspired by the sea...

Jens Poulsen
Fisk, Oil on Canvas, 160 x 160 cm
www.Poulsen-Arts.dk
An autodidactic Danish artist who primarily works with oil on canvas, Jens Poulsen says, "I'm attempting to catch a coherence with my surroundings, a gathering of information/situations—simplified in composition."

Donna Schaffer
Rainbow Starfish in Monterey Bay, Oil on Canvas, 20 x 20 inches. RIGHT: *Reflection of a Humpback Pectoral Fin*, Limited-Edition Museum-Quality Giclée on Somerset Watercolor Paper, 16 x 24 inches. **www.underwaterpaintings.com**
Donna Schaffer has been a scuba diver since 1976 and an underwater photographer since 1983. Since 1998, she has been a full-time fine arts oil painter. She travels to dive locations in many parts of the world where she photographs the underwater marine life and scenes, and makes reference sketches for her paintings.

Gini Holmes
BP, 2005, Printmaking Giclée, Open Edition, 16 x 13 inches
Original Price: US$ 150, € 95, UK £ 74. **www.mesart.com**
A traditionally trained print maker, Gini Holmes focused on more experimental methods after she received her BFA from Stanford University in lithography and painting. She completed a Masters of Science in Visual Studies specializing in experimental graphics from the Massachusetts Institute of Technology (MIT) where she worked with Electrographic Printing using a variety of copiers and handmade papers. She is now working with dye-sublimation transfers onto fabric and tile surfaces.

ocean arts

Art of the Sea

William Nutt

Octopus, 2003, Champlain Black (Marble/Limestone) Sculpture, 29 x 34 x 22 inches
www.wnuttsculptor.com
William Nutt was an engineer before turning to fine art. He says that many have asked him, "How does one go from engineering to an artist sculpting stone?" To that he has two answers: "One, how could I not; and two, I don't find there to be much difference between art, science, and engineering." He believes that great works of art and theory and results of engineering and scientific discovery are similar in that they both can contain incredible beauty, artistry, elegance and meaning.

Steven Forrai

Untitled, 1999, Steel Sculpture, 75 x 17 x 31 inches
Price: US$ 17,000, € 10,858, UK£ 8,416. **Absolutearts.com**
The work of self-taught artist, Steven Forrai, evolved from the bending, shaping and fusing of scrap electrical metallic tubing. Later, he focused his energies on fine art and replaced his stock with refined materials including steel and aluminum, brushed then sealed with an epoxy base coat and an aliphatic urethane at the end. He says, "My creations are never completely planned, but started with a size and object in mind. From there my mood, sounds and atmosphere finishes off the piece for me."

Joe Pogan

Fish, 2006, Found Metal Sculpture, 23 x 19 x 11 inches
Native Oregonian, Joe Pogan, received college education in art and welding after serving four years in the US Navy. He worked for more than 20 years as a professional welder. Combining his welding expertise and artistic talent, he has created a variety of animal sculptures using "found metal" objects such as old watches, sprockets, nuts and bolts. He says, "...the end goal is an eye-catching, fascinating amalgamation of metal with odd nooks and crannies you can explore for hours." **www.joepogan.com**

Sandra & Carl Bryant

Tradewinds, 2007, Mosaic, 30 x 28 x 1 inches. Original Price: US$ 1,890, € 1,207, UK£ 935. An abstract swirl of waterlife in blues, greens and warm hues. BELOW: *Beautiful Dreamer*, 2007, Mosaic, 24 x 24 x 1 inches, original sold. Abstract mosaic of the sand clouds sky and sea.

Artistic husband and wife team, Carl and Sandra Bryant, specialize in handmade glass and ceramic fine art mosaics. Their studio is located in the Pacific Northwest where they first started painting and making handmade

tile. In 2001, they discovered their passion for mosaics, which combined the two. Each piece is made by hand blending high quality glass, ceramics and other fine materials into a piece of art that is unique and lasting. Most of their fine art works have an average of 1,600 individually shaped pieces of glass per square foot.
www.showcasemosaics.com

Jangling Jack

Octopus made from two recycled silver forks features two crystal eyes. Height: 10cm. Price: AUD $35 + delivery
www.janglingjack.com.au
Jangling Jack is the creation of Chris Hartshorn and Steve Dessaix who have been working together since 1989 in a joint effort to "recycle the past to create the present". On 25 acres of virgin Australian bushland, their workshop is located on the Hawkesbury River in New South Wales. Their work is inspired by the natural beauty of their surroundings as well as "the historical past and industrial beginnings".

ocean arts

Art of the Sea

John Brooke
Pacific Warrior, 2007
Wood Sculpture, 23 cm x 67 cm x 18 cm
Original Price: US$ 2000, € 1277, UK£ 990
www.absolutearts.com
John Brooke's home overlooks a beach, and so, he has ample opportunities to swim on most days. This sculpture is all about the amazing underwater creatures he meets. He says that more often than not, "Contemporary Art talks only to the cognoscenti" and feels that this defeats its original purpose, which is to speak to anyone who wants to use his or her visual imagination. As an artist, this is what he tries try to do with his work.

Dan Townsend
Alice the Angler fish, 2007, Mixed Media Sculpture, 22 x 11 inches x 4 inches. Original Price: US$ 100, € 63. UK£ 49.
www.absolutearts.com
A fun whimsical fish, *Alice the Angler* is made from palm fronds and papier maché. She is then air brushed and hand painted. Dan Townsend says she is the only true palmfish in the world, just Google "Palmfish" and find out. A true invention of a creative mind, the artist discovered this fresh new idea 14 years ago and is still having fun with it.

Fatmir Gjevukaj
Underwater, Painting
36 x 48 inches. Original Price: US$ 3,200, € 2,044, UK£ 1,584.
www.fatmiri.com

Bernadette Badali
Travel Lines - Water, 2006, Mixed Meda on Canvas 36 x 60 inches.
www.badalibeal.ca
Toronto artist, Bernadette Badali, graduated from the Ontario College of Art and the University of Guelph, where she studied painting and photography. Working in these two mediums, she continues to explore textures in nature and architecture as her subject matter. She says, "I have learned that tactile surfaces in nature are formed through a process of growth and layering. I borrow this method to build the organic forms in the composition using fabrics and papers with different qualities. I structure the forms within the painting, but the surface area, such as folds and ripples, are created randomly through the flexibility of the materials, further imitating nature's process."

IN OUR NEXT ISSUE

Sulawesi
Hans Hass
Palau Weh, Sumatra

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