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Currently a capacity crowd would have to use the Rendezvous in shifts. Eight divers aboard this boat would be severely cramped. Caribe Bay says they are awaiting delivery on two new bonefishing boats that will be able to double as dive boats.

Caribe Bay is not up to the standards of basic dive operations elsewhere in the Caribbean, but it has the potential to become a premier dive resort. Whether the owners ever realize that potential remains to be seen.

Prices are steep for what Caribe Bay itself is offering now, but if you like out-of-the-way resorts, you won't mind paying. A few dips over the wall may change your mind about the inadequacies of the management and the hassles of getting there.

D. C.

*If I try to list the number of places that have a decent wall dive from the shore in front of the resort, I come up with several fingers left over. CoCo View on Roatan, Sipadan off Borneo . . . hmm . . . good beach diving certainly enhances the odds of a land-based operation getting my attention.*

J. Q.

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# Accidents and Incidents

## *Learning from the mistakes of others*

It's not as enjoyable as reading about the thrill of crystal clear water and large pelagics, but the benefits of analyzing how divers die are real. We are expanding our coverage to deaths of divers around the world, selecting those cases that we sport divers should study so that we can save our own bacon.

Last year, the Aussies released studies of several deaths occurring a couple of years before. Here are some cases that deserve our attention.

### **Rough Water**

While their son was having a scuba lesson from the instructor who had trained them, the parents made a separate dive. The wife had completed her training eight months before, but her husband had several years of diving experience. Neither of them had dived before in this location.

They swam underwater from the beach to a depth of 35 feet. After 35 minutes, the wife had 700 psi remaining, so she stayed where she was while her husband surfaced to check their position. Unsure where they were, they swam north about 30 yards and surfaced, she near shore in moderately rough water, he 10 yards further out in calmer water. He signaled for her to join him but then lost sight of her. He dived, intending to meet her underwater, but instead saw her lying on the bottom with the regulator out of her mouth. When he replaced it in her mouth, she did not respond. He inflated both their BCs and brought her to the surface. She vomited when he attempted to revive her.

He towed her to the rocks, but the power of the surf tore off his mask and pulled the regulator from his mouth, and he lost his grip on his wife. He managed to

climb the rocks and reach the beach, where he told the instructor what had happened. The instructor found her under a ledge but had to wait for a surge to abate before he could retrieve her.

She may have hit her head and lost her grip on her regulator while being tossed about in turbulent water, but she appeared to have no significant head injury. Nonetheless, both she and her husband seemed to have underestimated the power of the water and the strength of its flow off the rock, resulting in her death.

### **Air Embolism**

The charter boat carried five divers and an instructor, who was also the boat operator. Diving conditions were excellent, with no current and good visibility in 45-50 feet of water. The divers were assigned as a buddy pair and a trio, with the instructor

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watching in midwater above them.

John had made 14 dives, none deeper than this one. After 30 minutes, he signaled that he was low on air and intended to ascend. His buddy still had 1,000 psi, so she decided to continue diving, but watched as he made an unhurried and apparently normal ascent.

The instructor noticed that she was alone, and when he was unable to see any diver at the surface, they ascended together. He saw John climb from the water onto the steep, rocky shore of an islet.

He took the boat across to the diver. Fifty yards from the rocks, he shouted to John to swim out; but John fell back into the

water and lay face up and motionless. The instructor jumped in and swam to him. John's BC was inflated and his weight belt was missing.

John was pulled aboard and given cardiopulmonary resuscitation, but the rescue effort was unsuccessful.

The autopsy showed air in the aorta, both ventricles, and several major arteries, signs of a massive air embolism. It is noteworthy that he made an apparently calm and correct solo ascent and tried to climb up the rocks before he collapsed.

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## A Near-Fatal Attraction

Full face masks are becoming popular, if the increase in exposure at the DEMA convention is any indication. Outfitted with communication devices, they permit voice transmission between instructors and students and buddies:

photographers, treasure hunters, exploring divers, marine biologists, and people who just can't resist talking about what they're seeing.

Last year a group of Midwest divers traveled to the Gulf of Mexico off the Florida panhandle. While experienced in low-visibility river and quarry diving, as well as ice and Great Lakes diving, some had never dived deeper than 40 feet.

One 63-year-old diver wore an AGA full face mask. He had gone to 85 feet on his first dive, then again 90 minutes later. On this second dive, he ascended to 35 feet, where he passed out (from too much carbon dioxide, not enough oxygen, or both) and then sank back to the bottom, out of air. His companions rushed to him, found he was not breathing, and ripped off his face mask to give him a spare regulator. But his mouth was so swollen they couldn't insert the regulator.

They dropped his weight belt, ascended with him, and signaled to the boat. When he was hauled on board, his eyes and nose were swollen shut, and his lips were filled with blood blisters. His mouth was swollen tightly about his swollen, extruding tongue. He was not breathing and appeared nearly dead.

This was a near-terminal case of mask squeeze. With his airway almost completely obstructed, neither rescue breathing nor an ordinary oxygen system were of use. Fortunately, the boat was equipped with an oxygen respirator, and both captains on board were trained in its use.

By sealing the mask on his swollen face and activating the purge valve, they forced pure oxygen into his lungs. Soon, he shuddered and began to breathe on his own, then began fighting the mask and complaining that he was all right.

He was rushed to the Pensacola Naval Air Station, where a neurological examination showed he did not require chamber treatment. The only residual effect was temporarily blurred vision in one eye due to ruptured blood vessels.

Bud George, an electrical engineer who also operates the dive charter boat *Pequod*, and Jim Hecker, captain of the *Pequod*, originally reported this incident in *Pressure*.

[Editor's note: The authors comment that the rescuers should have inflated the victim's BC and let him ascend to the surface, with less risk to themselves. But in these situations, "responses tend to be reflexive." And I have a question. Squeeze is an easy problem to solve; it takes a simple exhale into the mask. This was his second dive. What am I missing, here?]

## In Chains

Arthur had taken his basic course seven months before and had dived regularly since. He and his four friends carried lights for the night dive, but his was the brightest. Sixty feet from shore, they descended to 10 feet, then swam 150 feet along a rock face. Two divers decided to return; Arthur and the other two continued on their way. Arthur, in the rear, had 700 psi, his buddies more than 1,000 psi. The leader checked frequently, but after kicking about 10 yards between checks, noticed that Arthur was missing.

They retraced their way but did not see him or his light. After a surface search, they found only his light and one fin. They returned to shore and notified the police.

Searchers found Arthur beneath the surface with a chain wrapped around his upper body and arms, mask off, regulator lying loose. He was missing a fin and a glove. Rescuers trying to ditch his weight belt found that the chain had jammed the quick release. The inflator hose was disconnected, so they were unable to

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inflate his buoyancy vest. His tank was out of air and contained some water.

Air was found in many of his major blood vessels. Arthur had suffered a massive air embolism, apparently while struggling to free himself.

## Equipment Mistakes

The diver had trained 10 years before and had considerable experience, but had not dived for 12 months. After lunch, he tidied his boat while his wife sunbathed. Later she saw him surface about 60 feet out, then submerge again, apparently normally. Eventually she realized that he should have completed his dive long before; she decided to walk along the beach to look for him. When dusk fell and he had not returned, she went for help.

The next day, police divers found his body. He had ditched his weight belt but it had caught on the crotch strap of his BC because he had put on his weight belt before his other equipment. His tank was nearly half full, but he would have been unable to inflate his buoyancy vest because the inflation hose did not fit the connection on his vest. Unable to discard his weight or inflate his BC in a time of need, he drowned.

## Tragedy of Errors

A resort dive operation took inexperienced divers to the Great Barrier Reef without telling them how to use their BCs or how to ditch their weight belts; the instructor was expected to introduce them to these emergency procedures on shore before starting the dive. This, it was thought, would reduce the risk of air embolism in novices making a sudden uncontrolled ascent.

One diver, James, was initially underweighted. The instructor corrected this by placing a coral rock in his BC.

With the instructor leading, the novices swam underwater 50 yards to a depth of 10 feet. Looking back, the instructor noticed that James was missing. He signaled to the others to stay where they were, then surfaced.

James was struggling, having difficulty floating, so the instructor inflated his BC. James was finding it hard to keep the regulator in his mouth because

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*Hearing "a roaring sound like a motor boat," he turned to see his companion in the mouth of a 10-foot great white shark.*

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his lower dental plate was loose, but agreed to try again. Still he couldn't get under. He appeared tired, so the instructor reinflated his vest, turned off his air, and told him to swim on his back to shore.

After James had swum 20 feet, he started to cough profusely, then his head fell back. The instructor swam to him and called for the dinghy. He ditched James's equipment, then began emergency procedures in the dinghy and cardiopulmonary resuscitation after reaching the boat. Resuscitation was hindered because James had vomited. He never responded.

This is a case rife with human error, beginning with failure to

inform the divers about managing buoyancy vests and weight belts, and leaving novice divers to fend for themselves on bottom. And what about turning off the air before a surface swim back to the beach?

An investigation found significant faults with the equipment: James's regulator supplied too little air at 20 feet, or under heavy demand when the diver was stressed and air-hungry. It breathed wet, enough to frighten any beginner. James had a loose lower dental plate and couldn't keep the regulator in his mouth or keep an adequate mask seal — problems that can cause struggling and panic and lead to death.

Yet James's death was attributed to heart disease, which James failed to mention when he was asked to declare his medical history before the dive.

## Great White

Two divers were close to the bottom in 25 feet of water, the lead diver looking back from time to time to stay with his buddy. Stopping to examine a brightly colored rock growth, he heard "a roaring sound like a motor boat," and a large shark rushed past, stirring up sand.

He turned to see his companion in the mouth of a 10-foot great white shark, with blood pouring out. The roar was air escaping from the severed air hose as the tank emptied itself. The buddy rushed to the boat and reported the attack.

An immediate search was made, but the only portion of the body recovered was part of one lung. His tank, fins, the weight belt buckle, the severed air hose without the regulator, and a torn wetsuit hood were also found.

Ben Davison