

# Fifty Fathoms Down

## Thrilling Story of the Sinking of a Submarine

by Morgan Robertson.



Raising His Head and Shoulders Through the Opening He Looked Across a Dark Heaving Sea at a Full Moon Hanging Above the Horizon

The following story of the sinking of a submarine is of peculiar interest because of the accident to the F-4 off Honolulu harbor and because it was written by Morgan Robertson, who died only the other day. It appeared in the collection of sea stories by Mr. Robertson, entitled, "Down to the Sea."

THE United States submarine torpedo-boat diver had come to the surface to blow out, to recharge her storage battery and to restore her supply of compressed air to its working pressure of 2000 pounds to the square inch. The first two were accomplished, but there being something wrong with the air compressor motor, the last was delayed while a machinist and two electricians swore over it—or under it, for it was at arm's length overhead—and the boat, in the awash, or diving condition, ran along under her gasoline engine.

Breen, temporary commander, raised his boyish face up through the conning tower hatch, the hinged lid of which was held upright by a strong spring, and looked around at the night. It was pitch dark and starless, but over to the east the upper limb of a full moon was just appearing above the horizon. The hinged lid of the hatch prevented a view astern; the engine exhaust drowned the lesser sounds of the sea.

A curious, rushing sound mingled with the puffing of the exhaust, a voice high above and astern sang out, "Something under the bow, sir!" and a huge small, semi-submerged craft a glancing blow from astern, heeled it a little, and bore it under. Breen was washed downward by the rush of water, but held a grip on the conning tower ladder and found voice to call out: "Stop the engine! Shut off the gas!" Then, it came that almost solid column of descending salt water, he fought his way upward until, face above the hatch again, but looking now into the blackness of the deep sea, he seized the hand hold of the hatch lid and pulled it down. It closed with a crash that would have shivered anything but armor steel and Breen, half drowned, fell to the floor of the handling-room.

"One hundred and ten!" he called, "and still sinking! Out with them all quickly!"

The sinking boat was now slightly "by the stern" from the expenditure of the water that had replaced the torpedo, which water is, under normal conditions, retained in a tank and shifted aft to others as torpedoes are hauled forward, in order to maintain the horizontal position of the boat; but they were expending weights now, and it mattered not if the boat stood on her tail for a time, provided she floated. She did give promise of the erect attitude, reaching an angle of ten degrees with the release of the third torpedo, but at this moment there was a shock and a shudder through the steel hull, then a bumping, scraping sound.

"Good!" exclaimed Breen. "We've reached the bottom, 123 feet down. Three hundred and fifty's the crushing point."

"But we're scraping along with the tide, sir," answered one of the men, "and we may go deeper."

"Then we'll find the torpedoes right above us," said Breen promptly. "Out with the other two."

Out they went, one after the other, and after them the water in the tube. The boat lifted her bow to an angle of 25 degrees, but the scraping and bumping of the propeller guard on the bottom continued, and the depth indicator saw a reading of 300. He was 50 fathoms below the surface.

Breen's emotions for the next few hours need not be recorded. They were

below the surface and dragging down him. The men at the hand pump quit the fruitless labor and joined them. They looked into one another's pale faces. Only Breen's showed decision.

"Draw lots," he said, bringing forth a box of matches from his pocket, "as to who goes first."

"You mean last, sir, don't you?" asked the engineer. "It makes no difference who goes first on the chance of swimming up over a hundred feet to find a torpedo at night, but some one must remain to fire out the last man, sir."

"I remain," said Breen. "No arguments about this. I am the commander, and should have kept a better lookout."

"But, Lieutenant," said the other engineer, "can't we shoot the boat up on a slant by the engine? The sparkers are out of water."

"No," said Breen. "The conning tower hatch would still be under water and we would be far away from the torpedoes. They are now right above us. We know that much. Who goes first, now?"

"I will," said one of the trimming tank men. "But, Lieutenant," he added, "we can swim up in two minutes. I should think, and I've held my breath three; but how'll we know which way to swim? It's night up there. We can't see."

"If your head and stomach don't tell you, let your knife hang loose by the lanyard. I'll hang down. Swim parallel. Hold on. Keep your shoes on!" the man was shedding them—"take all weights out that you can. Put your coats on, all of you. It's a cold night up above. You'll need your coats riding a torpedo."

"Good-by, sir. Good-by, boys—all around. No time to lose. I find a Whitehead I'll keep singin' out."

He threw open the breach of the tube and crawled in. A man stood with his hand on the compressed air valve; another stood by the bow port lever; Breen himself was shedding them—"Take a good breath when your hoar the breach closed," he called in, and was answered. Then he slammed to the swinging breach door, locked it and waved his hand to his men. They knew the drill. Water was admitted at once, the bow port was lifted, compressed air was turned on, there was the usual cough and thud and lurch of water and a man under a pressure of four atmospheres was swimming somehow through water black as night, guided only by his knife lanyard or the feel of his head and stomach.

The tube was blown out and another man said good-by and crawled in. He was ejected. Then the performance was repeated again and again, while Breen watched the dials that told of depth and inclination, and listened for a cessation of the scraping sound of the propeller guard. There was none, and both inclination and depth registers showed increase.

He himself ejected the last man and stood up, alone, in a boat 140 feet below the surface of the sea, her bow lifted to an angle of 30 degrees from the horizontal, her main motor drowned and her auxiliary motor burned. There was one chance in a million that he would be rescued; but as he stood on the slanting floor of the handling room the hope of this one chance came to him, for the scraping and bumping had ceased.

He looked at the depth indicator and waited. Not a sign of rising from the expenditure of weights, as he had hoped for a moment; the propeller guard must have caught on some projection on the bottom, and was holding her from drifting further with the tide. This was proved to him by a new and faint sound coming through the steel walls of his coffin—the sound of rustling water passing by. But it soon gave way to the bumping and scraping; and when, two hours later, this grew fainter and finally ceased and he again looked at the depth indicator he saw a reading of 300. He was 50 fathoms below the surface.

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mainly concerned with that one chance in a million, and ended in prayer; but following the prayer came the much used and abused homely, but practical, reflection that the Lord helps those who help themselves, and he arose from the floor where he had thrown himself and looked around—first, at the air pressure indicators. All but two registered at zero; he had two tanks at 2000 pounds pressure and he could have blown out a few more torpedoes, or men, or tanks of water, but not that water washing about aft.

He thought of the storage battery beneath the flooring—30 large jars of sulphuric acid, in danger from contact with that washing salt water—and removing the hatch inspected it. He found that the last jars at lifted six inches above the water level, and knowing that they were designed for an inclination of 45 degrees, was reassured. He looked at the burned out motor overhead in the handling room. It worked the air compressor and one of the bilge pumps, the other being connected to the main motor, under water and equally useless. He had a Naval officer's knowledge of electricity and motors, acquired at Annapolis, and this told him that it would be hopeless, even for a moment, to attempt re-wiring that small motor with the dried out wires of the other.

He studied the main motor, nearly buried in water. When dry it worked with 70 horsepower. It would pump out, against the pressure of the sea, "trouble" No time to lose. I find a Whitehead I'll keep singin' out."

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form of sweet, refreshing sleep, brought on by the suicidal extravagance in air. And when he awakened there was a thought, or the remnant of one, a lingering survival of something he had dreamed—a phrase repeating itself and dwindling away, as the details of valve and piping took form before his eyes.

It was of gases, this thought—of a drying agent for gases? What was it? Then it came to him out of the forgotten chemistry in his subconscious mind: "Sulphuric acid."

He had 30 jars of it under his feet. He had lead and copper piping in his scrap heap forward. He had two electric fans used for ventilation on the surface and a blower, fixed in the ship's, but available on a pinch—all four wired and ready, with a 2800-ampere-hour battery to drive them. Wild with hope he sprang to his feet and went to work.

In three hours he had constructed from the back of his coat a somewhat shaped funnel that stretched around the wire guard of a fan wheel; and this he fitted onto the end of a length of lead pipe, the other end of which was all but immersed in the acid of a battery jar in the hold. With the fan blowing and buzzing into the funnel and a stream of air rattling the surface of the acid he yet went on contracting; and with another fan, unscrewed from its shaft and rewired to a new location, he caught this dried air as it rose and drove it aft over the motor. Smiling like a child with a toy, Breen sat down and watched it, his mind intent upon chemistry, that he once had hated, that he had so completely forgotten.

The air was again very bad; his head was aching as it had ached before, and he needed no clear recollection of the forgotten science to know that the dominant irritant was the carbonic acid gas from his lungs. How to purify the air he did not know. This boat was not equipped with the apparatus for such purpose that he had read of in plans and specifications, and all the chemistry that would come to him was the old, familiar classroom test for carbonic acid gas, or—as he liked to call it now, with his mind on chemistry—carbon dioxide. This testing reagent was lime water, but the chemical term for it was beyond him. He went to sleep at last, thinking of lime water and the chemical name for it.

As he slept fitfully, with intervals of half waking thought, chemical terms, long forgotten and bearing no seeming relation to lime water, ran jumblingly through his head—potassium chlorate, manganese dioxide, chloride of sodium, chlorhydric acid. These he related through the jumble and remained when he had awakened. He repeated and remembered them. But what had they to do with lime water? Nothing that he could remember.

Chloride of sodium was common salt, he knew, and he had plenty of it, dissolved in water—more than he wanted. Chlorhydric acid—hydrochloric acid—muriatic acid—an acid containing no oxygen, the one gas that he needed so badly—formed of hydrogen and chlorine, he knew, and he had plenty of it, dissolved in water. But what had they to do with lime water? Nothing that he could remember.

His mind returned to chlorhydric acid, to hydrogen, to chlorine. How were they made? They were all there—in his sea water. But why these persisting thoughts? His waking thought of sulphuric acid as a drying agent meant something. Did it mean more? Sulphuric acid, one of the most powerful chemical agents known—the most powerful electrolyte—electro-electrolysis—"Hurrah!"

He bounded to his feet. He had it, Electrolysis of water yielded oxygen and hydrogen. But why had manganese dioxide and potassium chlorate so persisted in his mind? And lime water—that had that to do with his problem, now solved by electrolysis?

Slowly the memory of the school-day lessons learned by rote filtered up from the past—the test tube manufacture of oxygen by the union of these chemicals in the presence of heat. And lime water, with its affinity for carbon dioxide? There was no lime on board, hence no lime water. But there was water—too much. Where was the affinity? It was slower in coming, but it came—the old lessons learned by rote

and forgotten. "Carbon dioxide is soluble in water, volume for volume." "Oxygen is but slightly soluble in water—about three parts in a hundred."

"I see how it is," he said, with the infantile smile that had come to his boy's face in this trouble. "It's the subliminal self that remembers everything; and when you've guessed all around the subject it pops out and hits you when you've touched it."

He found some spare insulated wire among the stores and rigged two lengths from the pole of the battery, scraping the ends and immersing them in the salt water. A few bubbles arose, then ceased.

"Funny how things come back when you need them," he said, as he pulled up the wires. "I want platinum electrodes and solder and soldering fluid—chloride of zinc—zinc cut by hydrochloric acid. Wonder if I'll have to make my acid?"

He did not. He found a soldering outfit in the locker, then rummaged his scrap heap forward for platinum sparkers and, finding very little of the precious metal, ruthlessly smashed all but three of the electric bulbs that lighted his prison, robbing them of the platinum wires that led the current into the carbons.

Claustrophobia for he was but a theoretical mechanic—he soldered the ends of the platinum wires and fragments of the copper ends of his terminals, about half to each, making brushlike electrodes of the largest possible surface exposure. Then he immersed them, and was gratified at the result. Bubbles arose in generous quantity.

"Now, which is which?" he said, as he parted over them. "Last night I had two parts hydrogen to one of Oxygen. But the bubbles seem about the same size."

He stopped and inhaled deeply of the air over one column of bursting bubbles; a little of this brought on a curious feeling of faintness, with a desire to draw a longer breath.

"Hydrogen, surely," he said. "Now the other."

A half inhalation over the other bubbles sent him back, coughing and choking, with a bitter, astringent taste in his throat.

"No," he said, as he pulled up the wire, "this is carbon dioxide. It's some other gas. I must separate them somehow."

He racked his brains for the rest of the day—until his clock told him that sleeping time had arrived—but could not remember more of his chemistry. He could only fix in his mind a few chemical facts not forgotten; that he was using up the existing oxygen by combining it, in his lungs, with carbon to form carbon dioxide, 10 per cent of which in the air might be fatal; that the hydrogen which he would make with his oxygen, was now poisonous, like the nitrogen of the air, but that, there being less of it as a diluent, he might suffer from a preponderance of oxygen; and that this astringent gas that would also evolve from the salt water was a deadly poison to be got rid of. But how?

Was it carbon dioxide? He did not need to sleep on the problem; he had already slept upon and solved it. It came to him suddenly in the formulated sentence of the morning. Water would absorb carbon dioxide, volume for volume, while oxygen would only stir up three parts to a hundred.

"What a fool I am!" he muttered. "I can simply blow the whole mixture back into the water again and again and get rid of everything but the oxygen and hydrogen."

The motor was dryer to the touch, but still much too damp for use; so, for the present, he left his air-drying apparatus intact and constructed a supplementary pneumatic feed system that would have scandalized a mechanical or electrical engineer, but was a triumph of driven genius to poor Breen, dying of headache at the bottom of the sea.

First he reversed the polarity of the fixed blower in the air pipe overhead, so that it worked downward; then he propped up and secured a section of bubble lead piping that would catch the mixed bubbles as they burst and deliver the mixture to this blower. Below this fan he suspended a fairly airtight funnel formed of the seat and one leg of his trousers, and to the funnel secured another length of copper piping, the lower end of which he hammered flat so that it would spread the flow of gases to a fan-shaped stream conducive to a large number of smaller bubbles.

This end he immersed in the deepest part of the food engine-room, secured his shirt to form a hood over the bubbles that would rise and under this hood arranged his original funnel and fan that drove air through the lead pipe to the sulphuric acid. He had contrived an apparatus to manufacture two volumes of hydrogen to one volume of oxygen, with an unknown quantity of poisonous gas—that would suck itself into the foul air of the closed hull and drive it, with the mixed gases, in a divided stream into the purifying

water—and that would force the oxygen which arose onto the drying sulphuric acid, be then sent back over the damp motor.

Arranging his battery wires in the water he turned on all the fans and tested the result by his sense of smell. There was but the slightest bad odor in the blast from the last fan—not enough to distress him; and, utterly tired out, Breen went to sleep as happy as a man may be on the cold sea bottom without shirt or trousers, and barely relieved from lingering death.

When he awakened his fans still buzzed merrily, his headache was gone and the motor much dryer to the touch. His problem seemed to have been solved, for there were no more chemical terms or "guesses" remaining from his sleep. Yet, as he felt of the damp motor and noticed the hydrogen bubbles rising and escaping into the air without going through the drying process, he felt, and obeyed a strong impulse to turn them into the pipe that caught the others.

"Can't do any harm to dry the hydrogen," he mused; and it would mix with the oxygen later, in any case, while the water won't absorb it—only the carbon dioxide."

A few moments later he noticed an utter absence of the bad odor in the blast from the acid to the motor and felt only a slight increment of gratification. It was long after, with a larger experience of undependence upon the infallibility of subliminal promptings that he realized that it was not to dry the hydrogen that he had turned it into his pipes.

From this on his problems were mechanical; he was interested in the rapidly drying motor and its potencies when he dared turn the current into it. He realized these potencies—he knew that the 70-horse-power motor could pump out the water and bring her to the surface; but knowing too that under the coils moisture would remain long after the surface windings were dry and that a short circuiting of the coils might rack the insulation to pieces by the formation of steam, he waited a full week after the last dampness had apparently gone; then, uncoupling the motor from the shaft and turning on the switch, he carefully moved the controller and gave it momentary contact. A thin cloud arose from the motor and the armature moved an inch.

He inspected the cloud; it seemed to be steam, not smoke, and he tried it again with longer contact. The armature moved farther, and again he shut off the current, assured himself that there was no burning, and turned it on. This time he left it on and stood over the motor, watching the steaming armature slowly turn at about the rate of a steamboat's paddle wheel, while the commutator brushes threw out sparkling sparks six or eight feet.

His theoretical knowledge of electricity told him that these sparks indicated a waste of current; and he noticed that when his body interposed between the motor and the blast of dried air from the last fan in his system the sparks were reduced to minute sparks, hardly visible. With nothing to do now until his motor gained power enough to turn the pump, he busied himself in constructing a hood that would enclose the commutator and brushes, using his undrabbert for material and singing as he worked.

A man may be joyful at the bottom of the sea, shivering with cold in one garment, provided he is hopeful. And Breen was hopeful—his hood was a success; it stopped the extravagant sparking, but did not save enough current to work the pump, which fact he learned by connecting it. The armature moved faster, but stopped short against the small resistance of the inert water in the induction pipe. So he turned off the current, overhauled and lubricated the pump and waited.

Then he was very happy, now, singing and talking to himself while his heart beat a thumping accompaniment to the music, and the steel walls of his sunken prison rang with his words, delivered in shouts. He was not in the least cast down when two of his lights burned out and he danced forward in rapturous step, secured the remaining bulb, and danced aft with it, adjusting it just forward of the motor, where it would illumine his system of buzzing fans and bursting bubbles.

He did not enter up the log this day nor keep further track of the passage of time, being too lofty of soul to concern himself with such trifles; nor did he go to sleep while his heart beat as it came around. Who would sleep with a 70-horsepower motor dying out and needing attention, with a beautiful plant manufacturing, purifying and drying air—sweet, cool air, to be breathed by himself, and no other?

How pleasant it felt to his burning face and tingling fingers when he placed himself in its way! The world above, with its millions of men, had millions of cubic miles of air to breathe no better than his, that he had made for himself. This thought so pleased him that he put it to rhyme, and sang it to the steel walls in the voice of a boatwain's mate in bad weather. Louder he sang, and louder, until the music went out of his voice and left it a screech.

There were a few hours of this.

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