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Voyaging Under the Sea

II.—A Voyage on the Bottom of the Sea

SIMON LAKE planned an excursion on the bottom of the sea for October 12th. His strange amphibian craft, the "Argonaut," about which we had been hearing so many marvels, lay off the pier at Atlantic Highlands. Before we were near enough to make out her hulk, we saw a great black letter A, framed of heavy gas-pipe, rising forty feet above the water. A flag rippled from its summit. As we drew nearer, we discovered that there really wasn't any hulk to make out—only a small oblong deck shouldering deep in the water and supporting a slightly higher platform, from which rose what seemed to be a squatty funnel. A moment later we saw that the funnel was provided with a cap somewhat resembling a tall silk hat, the crown of which was represented by a brass binnacle. This cap was tilted back, and as we ran alongside, a man stuck his head up over the rim and sang out, "Ahoy there!"

A considerable sea was running, but I observed that the "Argonaut" was planted as firmly in the water as a stone pillar, the big waves splitting over her without imparting any perceptible motion.

"She weighs fifty-seven tons," said Mr. Lake, "and there are only two or three tons above water. I never have seen the time when she rolled."

We scrambled up on the little platform, and peered down through the open conning tower, which we had taken for a funnel, into the depths of the ship below. Wilson had started his gasoline engine, and I was wondering what became of the exhaust, which I heard rattling in the pipes, when I saw a white plume of steam rising from the very summit of the gas-pipe frame above us. "This leg of the A," explained Mr. Lake, "carries off the burnt gases, and this one brings in the fresh air while we are submerged. You see the pipes are tall enough, so that we can use them until we are more than fifty feet under water. Below that, we have to depend on the compressed air in our tanks, or on a hose reaching from the upper end of the pipe to a buoy on the surface." Mr. Lake had taken his place at the wheel, and we were going ahead slowly, steering straight across the bay toward Sandy Hook and deeper water. The "Argonaut" makes about five knots an hour on the surface, but when she gets deep down on the sea bottom, where she belongs, she can spin along more rapidly.

"Are you ready to go down?" asked Mr. Lake. The waves were already washing entirely over the lower platform, and occasionally breaking around our feet, but we both nodded solemnly.

"Open the center compartments," Mr. Lake shouted down the conning-tower. "I'm flooding the ballast compartments," he explained. "Usually we submerge by letting down two half-ton iron weights, and then, after admitting enough water to overcome our buoyancy, we can

readily pull the boat to the bottom by winding in on the weight cables. Unfortunately, we have lost one of the weights, and so we have to depend entirely on the compartments.”

The “Argonaut” was slowly sinking under the water. We became momentarily more impressed with the extreme smallness of the craft to which we were trusting our lives. The little platform around the conning-tower on which we stood—in reality the top of the gasoline tank was scarcely a half dozen feet across, and the “Argonaut” herself was only thirty-six feet long. Her sides had already faded out of sight, but not before we had seen how solidly they were built—all of steel, riveted and reinforced, so that the wonder grew how such a tremendous weight, when submerged, could ever again be raised.

“We had to give her immense strength,” said Mr. Lake, “to resist the water pressure at great depths. She is built of the same thickness of steel as the government used for the 2,000-ton cruisers ‘Detroit’ and ‘Montgomery.’ She’ll stand a hundred feet, although we never took her deeper than fifty. We like to keep our margins safe.”

I think we made some inquiries about the safety of submarine boats in general. Other water compartments had been flooded, and we had settled so far down that the waves dashed repeatedly over the platform on which we stood—and the conning-tower was still wide open, inviting a sudden engulfing rush of water.

“You mustn’t confuse the ‘Argonaut’ with ordinary submarine boats,” said Mr. Lake. “She is quite different and much safer.”

He explained that the “Argonaut” was not only a submarine boat, but much besides. She not only swims either on the surface or beneath it, but she adds to this accomplishment the extraordinary power of diving deep and rolling along the bottom of the sea on wheels. No machine ever before did that. Indeed, the “Argonaut” is more properly a “sea motorcycle” than a “boat.” In its invention Mr. Lake elaborated an idea which the United States Patent Office has decided to be absolutely original.

“I think we better go below,” said Mr. Lake, with a trace of haste in his voice. I went first, slipping hand over hand down the ladder. Mr. Stevens followed, and a great wave came slapping in after him, sousing down over his shoulders. Mr. Lake quickly shut down the conning-tower cap and screwed it fast over its rubber rims.

We found ourselves in a long, narrow compartment, dimly illuminated by yellowish-green light from the little, round, glass windows. The stern was filled with Wilson’s gasoline engine and the electric motor, and in front of us, toward the bow, we could see through the heavy steel doorways of the diver’s compartment into the lookout room, where there was a single round eye of light.

“She’s almost under,” said Mr. Lake.

I climbed up the latter of the conning-tower and looked out through one of the glass ports. My eyes were just even with the surface of the water. In the trough of the waves I could catch a glimpse of the distant sunny shores of New Jersey, and here and there, off toward Staten Island, the bright sails of oyster smacks. Then, the next wave came driving and foaming entirely over the top of the vessel, and I could see the curiously beautiful sheen of the bright summit of the water above us. It was a most impressive sight. Not many people ever have had the opportunity of looking calmly upon the surface of the sea from below. Mr. Lake told me that in very clear water it was difficult to tell just where the air left off and the water began; but in the muddy bay where we were going down the surface looked like a peculiarly clear, greenish pane of glass moving straight up and down, not forward, as the waves appear to move when looked at from above.

Now we were entirely under water. The ripping noises that the waves had made in beating against the upper structure of the boat had ceased. As I looked through the thick glass port, the water was only three inches from my eyes, and I could see thousands of dainty, semi-translucent jelly-fish floating about as lightly as thistle-down. They gathered in the eddy behind the conning-tower in great numbers, bumping up sociably against one another and darting up and down with each gentle movement of the water. And I realized that we were in the domain of the fishes.

I returned to the bottom of the boat, to find that it was brilliantly lighted by electricity, and to have my ears pain me sharply.

“You see the air is beginning to come down,” said Jim, the first mate, “and we are getting a little pressure.”

I held up my hand, and felt the strong gust which was being drawn down through the tail air-pipe above us. It was comforting to know that the air arrangements were in working order.

Mr. Lake now hung a small mirror at an angle of forty-five degrees just at the bottom of the conning-tower, and stepped back to the steering-wheel. Upon looking into the mirror, he could see the reflection of the compass, which is placed at the very highest tip of the brass binnacle that crowns the conning tower. “We can’t use a compass down here,” said he, “because there is too much machinery and steel.” He has found by repeated experiments that the compass points as accurately under water as on the surface.

Jim brought the government chart, and Mr. Lake announced that we were heading directly for Sandy Hook and the open ocean. But we had not yet reached the bottom, and John was busily opening valves and letting in more water. I went forward to the little steel cubbyhole in the extreme prow of the boat, and looked out through the watch-port. The water had grown denser and yellower, and I could not see much beyond the dim outlines of the ship’s spar reaching out forward. Jim said that he had often seen fishes come swimming up wonderingly to gaze into the port. They would remain quite motionless until he stirred his head, and then they vanished instantly. Mr. Lake has a remarkable photograph which he took of a visiting fish, and Wilson tells of nurturing a queer flat crab for days in the crevice of one of the viewholes.

As I turned from the watchport, my eye fell on an everyday-looking telephone, with the receiver hung up next the steel walls.

“Oh, yes,” said Jim, “we have all the modern conveniences. That’s for telephoning to the main part of the boat when the diver’s compartment is closed and we can’t get through.”

He also showed me a complex system of call bells, by means of which the man at the lookout could direct the engineer. “When we are down in unknown waters,” he said, “we have a big electric searchlight which points out the way.”

At that moment, I felt a faint jolt, and Mr. Lake said that we were on the bottom of the sea. “The bottom here is very muddy,” he said, “and we are only resting a few hundred pounds’ weight on our wheels. By taking in or pumping out water, we can press downward like a locomotive or like a feather. Where we have good hard sand to run on, we use our wheels for driving the boat; but in mud like this, where there’s nothing to get hold of, we make our propeller do the work.”

Here we were running as comfortably along the bottom of Sandy Hook Bay as we would ride in a Broadway car, and with quite as much safety. Wilson, who was of a musical turn, was whistling “Down Went McGinty,” and Mr. Lake, with his hands on the pilot-wheel, put in an occasional word about his marvelous invention. On the wall opposite, there was a row of dials which told automatically every fact about our condition that the most nervous of men could wish

to know. One of them shows the pressure of air in the main compartment of the boat, another registers vacuum, and when both are at zero, Mr. Lake knows that the pressure of the air is normal, the same as it is on the surface, and he tries to maintain it in this condition. There are also a cyclometer, not unlike those used on bicycles, to show how far the boat travels on its wheels; a depth gauge, which keeps us accurately informed as to the depth of the boat in the water, and a declension indicator. By the long finger of the declension dial we could tell whether we were going up hill or down. Once while we were out, there was a sudden, sharp shock, the pointer leaped back, and then quivered steady again. Mr. Lake said that we had probably struck a bit of wreckage or an embankment, but the "Argonaut" was running so lightly that she had leaped up jauntily and slid over the obstruction.

Strange things has Mr. Lake discovered about the bottom of the sea. He has found that nearly all sea roads are level, a fact of great importance to sea-carriages like the "Argonaut."

"People get the impression from the sea-bottom contours," he says, "that the ocean is filled with vast mountain ranges and deep valleys. As a matter of fact, these contours, in representing thousands of miles of width on a printed page, greatly exaggerate the depth, which at its greatest is only a few thousand feet, thus giving a very false idea. Some shores slope more than others, but I venture to say that there are few spots on the bottom of the Atlantic that would not be called level if they were bare of water."

We had been keeping our eyes on the depth dial, the most fascinating and interesting of any of the number. It showed that we were going down, down, down, literally down to the sea in a ship. When we had been submerged for more than an hour, and there was thirty feet of yellowish-green ocean over our heads, Mr. Lake suddenly ordered the machinery stopped. The clacking noises of the dynamo ceased, and the electric lights blinked out, leaving us at once in almost absolute darkness and silence. Before this, we had found it hard to realize that we were on the bottom of the ocean; now it came upon us suddenly and not without a touch of awe. This absence of sound and light, this unchanging motionlessness and coolness, this absolute negation—this was the bottom of the sea. It lasted only a moment, but in that moment we realized acutely the meaning and joy of sunshine and moving winds, trees, and the world of men.

A minute light twinkled out like a star, and then another and another, until the boat was bright again, and we knew that among the other wonders of this most astonishing of inventions there was storage electricity which would keep the boat illuminated for hours, without so much as a single turn of the dynamo. With the stopping of the engine, the air supply from above had ceased; but Mr. Lake laid his hand on the steel wall above us, where he said there was enough air compressed to last us all for two days, should anything happen. The possibility of "something happening" had been lurking in our minds ever since we started. "What if your engine should break down, so that you couldn't pump the water out of the water compartments?" I asked.

"Here we have hand pumps," said Mr. Lake promptly; "and if those failed, a single touch of this lever would release our iron keel, which weighs 4,000 pounds, and up we would go like a rocket."

I questioned further, only to find that every imaginable contingency, and some that were not at all imaginable to the uninitiated, had been absolutely provided against by the genius of the inventor. And everything from the gasoline engine to the hand-pump was as compact and ingenious as the mechanism of a watch. Moreover, the boat was not crowded; we had plenty of room to move around and to sleep, if we wished, to say nothing of eating. As for eating, John had brought out the kerosene stove and was making coffee, while Jim cut the pumpkin pie.

“This isn’t Delmonico’s,” said Jim, “but we’re serving a lunch that Delmonico’s couldn’t serve--a submarine lunch.”

By this time the novelty was wearing off and we sat there, at the bottom of the sea, drinking our coffee with as much unconcern as though we were in an uptown restaurant. For the first time since we started, Mr. Lake sat down, and we had an opportunity of talking with him at leisure. He is a stout-shouldered, powerfully built man, in the prime of life—a man of cool common sense, a practical man, who is also an inventor. And he talks frankly and convincingly, and yet modestly, of his accomplishment.

“When I was ten years old,” he said, “I read Jules Verne’s ‘Twenty Thousand Leagues under the Sea,’ and I have been working on submarine boats ever since.” At seventeen he invented a mechanical movement, at twenty he was selling a steering-gear which he had just patented. In 1894 he began to build his first submarine boat, the “Argonaut, Jr.,” and for more than four years he has been slowly perfecting, patenting, and financing his invention.

Having finished our lunch, Mr. Lake prepared to show us something about the practical operations of the “Argonaut.” It had been a good deal of a mystery to us how workmen penned up in a submarine boat could expect to recover gold from wrecks in the water outside, or to place torpedoes, or to pick up cables.

“We simply open the door, and the diver steps out on the bottom of the sea,” Mr. Lake said, quite as if he was conveying the most ordinary information.

At first it seemed incredible, but Mr. Lake showed us the heavy, riveted door in the bottom of the diver’s compartment. Then he invited us inside with Wilson, who, besides being an engineer, is also an expert diver. The massive steel doors of the little room were closed and barred, and then Mr. Lake turned a cock, and the air rushed in under high pressure. At once our ears began to throb, and it seemed as if the drums would burst inward.

“Keep swallowing,” said Wilson the diver.

As soon as we applied this remedy, the pain was relieved, but the general sensation of increased air pressure, while exhilarating, was still most uncomfortable. The finger on the pressure dial kept creeping up and up, until it showed that the air pressure inside of the compartment was nearly equal to the water pressure without. Then Wilson opened a cock in the door. Instantly the water gushed in, and for a single instant we expected to be drowned there like rats in a trap,

“This is really very simple,” Mr. Lake was saying calmly. “When the pressure within is the same as that without, no water can enter.”

With that, Wilson dropped the iron door, and there was the water and the muddy bottom of the sea within touch of a man’s hand. It was all easy enough to understand, and yet it seemed impossible, even as we saw it with our own eyes.

Mr. Lake stooped down, and picked up a wooden rod having a sharp hook at the end. This he pulled along the bottom. “You see how easily we can pick up a cable and cut it,” he said. “Why, we could crawl along from here and cut all the submarine cables and mine wires connecting with New York in half a day, and no one ever would be the wiser. More than that, if the ‘Argonaut’ had been at Santiago, we could have cleared the harbor of Spanish mines within forty-eight hours. Then we could have crept under the Spanish fleet, where our divers would have stepped out and deliberately set mines or even fastened torpedoes to the bottoms of the ships. When the work was done, we could have backed away, until we were well out of reach of the effects of an explosion. And then, a connection of the wires, and Sampson would have been saved the trouble of smashing Cervera!”

Indeed, it seemed the simplest thing in the world. But the “Argonaut’s” most serious work is in wrecking. Mr. Lake explained how difficult it is for divers to go down to wrecks from the surface, owing to the great weight of air-tubing and lifeline which they are compelled to drag and the unsteadiness of the attendants’ boat. In great depths the diver cannot stay submerged more than an hour at most, and three-quarters of the time is frequently spent in getting up and down.

“You see we are at the bottom all the time,” said Mr. Lake; “we just push our nose up into the wreck, the diver steps out with a short air-tube, and works right in the path of our searchlight. He can come back in a minute for tools, or to rest, and go out again without delay, no matter how high the waves are running on the surface.”

As we came up, Mr. Lake told us of his plan to build at once a 100-foot boat for practical work, the “Argonaut” being regarded more as an experiment.

We were now rising again to the surface, after being submerged for more than three hours. I climbed into the conning-tower and watched for the first glimpse of the sunlight. There was a sudden fluff of foam, the ragged edge of a wave, and then I saw, not more than a hundred feet away, a smack bound toward New York under full sail. Her rigging was full of men, gazing curiously in our direction, no doubt wondering what strange monster of the sea was coming forth for a breath of air.