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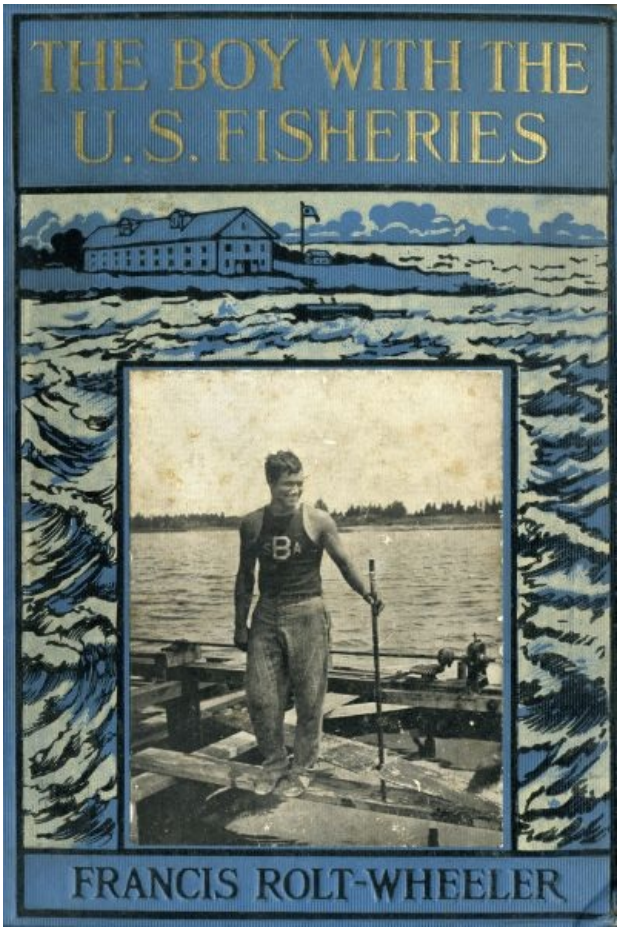

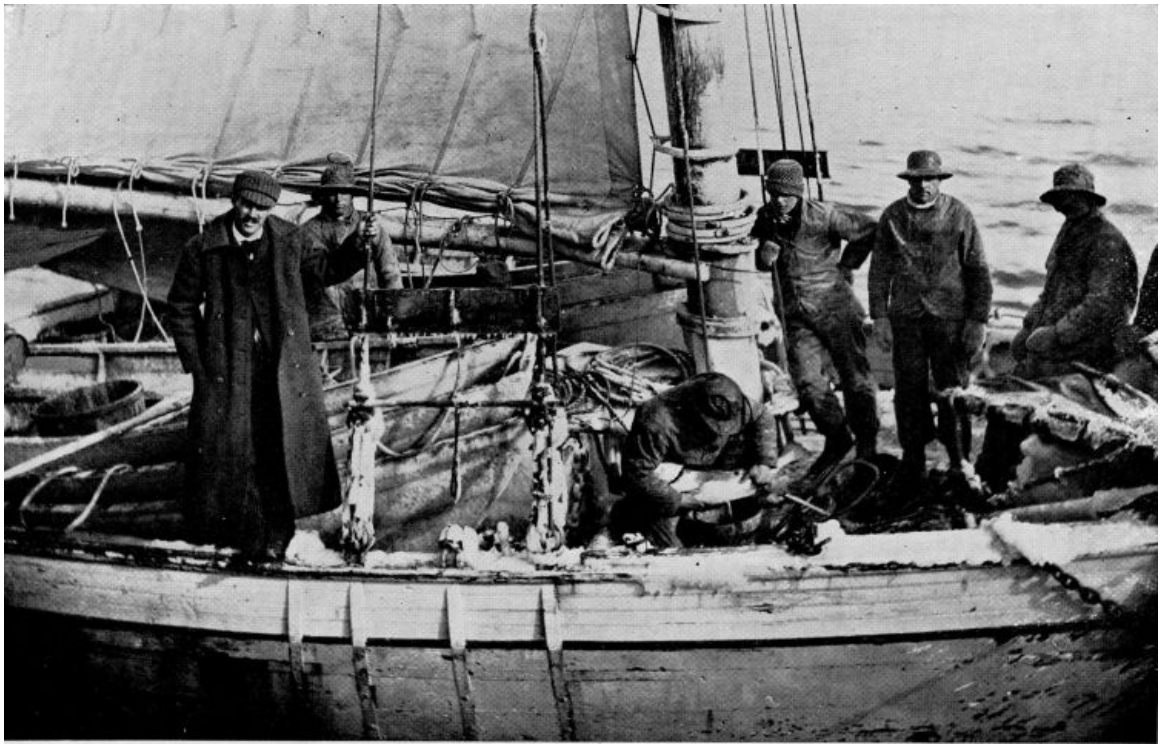

Stripping Cod at Sea on a Winter Morning.
Fisheries Bureau Spawn-taker aboard a trawler. Note the snow on the rail, the frozen spray on the mast, and the ice on the rigging.
Courtesy of the U. S. Bureau of Fisheries.

U. S. SERVICE SERIES.

THE BOY WITH THE U. S. FISHERIES

BY

FRANCIS ROLT-WHEELER

With Fifty-one Illustrations, principally from Bureaus of the United States Government

BOSTON
LOTHROP, LEE & SHEPARD CO.

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THE BOY WITH THE U. S. FISHERIES

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To My Son Roger's Friend

COLIN McLACHLIN

PREFACE

Treasure-ships, bearing richer cargoes than any galleons that crossed the Spanish Main, still sail

over the ocean to-day, but we call them fishing smacks; heroism equal to that of any of the pioneer navigators of old still is found beneath oilskins and a sou'wester, but the heroes give their lives to gain food for the world instead of knowledge; and the thrilling quest of piercing the mysteries of life has no greater fascination than when it seeks to probe the unfathomed depths of that great mistress of mysteries—the Ocean. Just as to save life is greater than to destroy it, so is the true savior of the seas the Fisheries craft, not the battleship; so is the hatchery mightier than the fortress, the net or the microscope a more powerful weapon for good than the torpedo or the Nordenfeldt.

The Bureau of Fisheries for the United States Government, Mr. Chas. Frederick Holder and his associates for the anglers of America, and the sturdy and honorable class of commercial fishermen are raising to the utmost of dignity and value one of the oldest and greatest of all industries. Not till the waste of waters is tamed as has been the wilderness of land will their work be done, and the Fisheries Bureau must ever remain in the forefront of such endeavor. To reveal the incalculable riches of this vast domain of rivers, lakes, and seas; to show the devotion of those whose lives are spent amid its elemental perils and to point out a way where courage, skill, and youth may find a road to serve America and all the world beside, is the aim and purpose of

The Author.

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THE BOY WITH THE U. S. FISHERIES

CHAPTER I

MAROONED BY A WHALE

"There she blows!"

Colin Dare, who was sitting beside the broken whale-gun and who had been promised that he might go in the boat that would be put out from the ship if a whale were sighted, jumped to his feet at the cry from the 'barrel' at the masthead.

"Where?" he shouted eagerly, rushing to the rail and staring as hard as he could at the heaving gray waters of the Behring Sea.

"There she blo-o-ows!" again cried the lookout, in the long echoing call of the old-time whaler, and stretching out his hand, he pointed to a spot in the ocean about three points off the starboard bow. Colin's glance followed the direction, and almost immediately he saw the faint cloud of vapor which showed that a whale had just spouted.

"Do you suppose that's a whalebone whale, Hank?" asked the boy, turning to a lithe Yankee sea-dog with a scraggy gray beard who had been busily working over the mechanism of the whale-gun.

"No sayin'," was the cautious reply, "we're too fur off to be able to tell yet a while. How fur away do you reckon we be?"

"A mile or two, I suppose," Colin said, "but we ought to catch up with the whale pretty soon, oughtn't we?"

"That depends," the gunner answered, "on whether the whale's willin' or not. He ain't goin' to stay, right there."

"But you usually do catch up?"

"If it's a 'right' whale we generally try to, an' havin' steam to help us out makes a pile o' difference. Now, in the ol' days, I've seen a dozen whales to wind'ard an' we couldn't get to 'em at all. By the time we'd beaten 'round to where they'd been sighted, they were gone."

"Well, I hope this is a 'right' whale," Colin said with emphatic earnestness.

"Why this one 'specially?" the old sailor asked.

"I heard Captain Murchison say that if we came up with a whale while the gun was out of order, rather than lose a chance, he would send a boat out in the old-fashioned way."

"An' you want to see how it's done, eh?"

"I got permission to go in the boat!" the boy answered triumphantly, "and I just can't wait."

"It's the skipper's business, I suppose, but I don't hold with takin' any chances you don't have to," was the gruff comment, "an' if you'll take the advice of an old hand at the game you'll keep away."

"But I want to go so much, Hank," came the reply.

"What for?"

"I'm trying to get Father's permission to join the Bureau of Fisheries," explained the boy, "and when Captain Murchison started on this trip, I begged him to let me come. The captain is an old friend of his."

"I'd rather you went in somebody else's boat than mine, then," was the ungracious response.

"Why, Hank!" exclaimed Colin in surprise, "what a thing to say!"

The old sailor nodded sagely.

"The skipper don't know much more about boat-whalin' than you do," he said, "that was all done away before his time. He's willin' to tackle anythin' that comes along, all right, but a whalin' boat is just about the riskiest thing that floats on water."

"How's that, Hank?" asked the boy. "I always thought they were supposed to be so seaworthy."

"They may be seaworthy," was the grim reply, "but I never yet saw a shipwright who'd guarantee

to make a boat that'd be whaleworthy."

"But I'm sure I've read somewhere that whales never attacked boats," persisted Colin.

"Mebbe," rejoined the gunner, "but I don't believe that any man what writes about whalin' bein' easy, has ever tried it in a small boat."

"Well," said the boy, "isn't it true that the only time a whale-boat is smashed up is when the monster threshes around in the death-flurry and happens to hit the boat with his tail?"

"Not always."

"You mean a whale does sometimes go for a boat, in spite of what the books say?"

"I never heard that whales cared much about literatoor," the sailor answered with an attempt at rough humor, "an' anyway, most o' them books you've been readin', lad, are written about whalin' off Greenland an' in the Atlantic."

"What difference does that make?" queried Colin. "Isn't a whale the same sort of animal all the world over?"

"There's all kinds of whales," the gunner said, as though pitying the boy for his lack of knowledge, "some big an' some little, some good an' some bad. Now, a 'right' whale, f'r instance, couldn't harm a baby, but the killers are just pure vicious."

"You mean the orcas?" the boy queried. "Only just the other day Captain Murchison was talking about them. He called them the wolves of the sea, and said they were the most daring hunters among all things that swim."

"Sea-tigers, some calls 'em," the other agreed, "an' they're fiercer than any wolves I've ever heard about, but I never saw any of 'em attackin' a boat. I have seen as many as twenty tearin' savagely at a whale that was lyin' alongside a ship an' was bein' cut up by the crew. The California gray whale—the devil-whale is what he really is—looks a lot worse to me than a killer. He's as ugly-tempered as a spearfish, as vicious as a man-eatin' shark, as tricky as a moray, an' about as relentless as a closin' ice-floe."

"There she blo-o-ows!" came the cry again from the crow's-nest.

Hank, looking over the side, caught sight of the spout and, with a twist of the shoulder, walked aft to the first boat.

"I'm going, too," Colin reminded him.

The old whaler looked at him thoughtfully and disapprovingly.

"Orders is orders," he said at last, "an' if the skipper said you could go, why, I reckon that ends it. An' if you're goin' anyway, you're safer in the big boat than in the 'prams.' Tumble in."

Colin clambered into the double-ended boat with its high prow and stern and settled himself down excitedly.

"I never really believed I'd get the chance to see any whale-spearing," he said. "Whaling with a cannon is only a make-believe. Now, this is something like!"

"Foolishness I calls it," put in one of the younger sailors. "Why don't the skipper put in somewhere an' get the gun put to rights? An' Hank is just as likely to fix that gun so as he'll blow some of us up with it when he does get it goin'."

"Always croakin', Gloomy," said the old gunner. "Blowin' you up would be no great loss. You'd ought to be glad to see what whalin' was like when your betters was at it."

"I'm glad," said Colin, as he pulled steadily at his long oar, "that we did wrench the gun-frame when that heavy sea came aboard."

"I don't see it," said the gunner; "mebbe you'll think presently that you'd ha' done better to be satisfied with readin' about whalin' in those books of yours."

"Well, it got me the chance to see the fun!" responded Colin.

"That wouldn't have been enough to start this business a-goin' if it hadn't been that the *Gull* was an old whalin'-ship before they put steam into her. The little bits of whalin'-steamers they build now only carry a little pram or two, nothin' like this boat you're in now. The *Gull's* one of the old-timers."

"She hails from New Bedford, doesn't she?"

"She took the Indian Ocean whalin' in the sixties an' came round the Horn every season in the seventies," Hank replied; "an' there's not many of her build left. Easy with that oar, Gloomy," he added, speaking to the melancholy sailor, who was splashing a good deal in his stroke, "an' avast talkin', all."

Swiftly, but with oars dipping almost noiselessly, the boat slipped up to where the two whales were floating whose spouts had been seen from the ship. The sea was tinged with pink from the masses of shrimp-food which had attracted the whales, and the great creatures were feeding

quietly. The surface was not rough, but there was a long, slow roll which tossed the boat about like a cork. Presently Hank, who was in the stern, held up one hand.

"Hold your starboard oars," he said quietly; "we'll back up to this largest one."

This near approach to the whales was too much for Gloomy's nerves. Instead of merely holding his long sweep steady in the water so that the stroke of the port oars would bring the boat around, he tried to make a long backward drive. As he reached back, the boat mounted sidewise on a swell, leaving Gloomy clawing at the air with his oar; then, the boat as suddenly swooped down with a rush, burying the oar almost to the row-locks; it caught Gloomy under the chin and all but knocked him overboard. The splash and the shout distracted Hank's attention for a second, and when he looked round a swirl of water was all that remained to show where the whales had been.

"I told you what it would be!" said Gloomy, picking himself up and speaking in an injured tone, as though he blamed everybody else for his own carelessness.

His protests, however, were silenced by a steady stream of descriptive epithet from Hank. The old gunner, without even raising his voice, withered any possible reply on the part of the clumsy sailor, whose inexpertness had caused their failure to get the whale.

"They were only humpbacks, however," added Hank, after Gloomy had been reduced to silence. Indeed, so shamefaced was the luckless sailor, that when he saw a spout a minute or two later he only pointed with his finger, without saying a word.

Noticing the gesture, Colin turned and saw with amazement a tall jet of vapor that had spouted from a whale close by. He looked at Hank expectantly, hoping to hear him spur the crew to a new venture, but the old whaler looked grave.

"Finback?" the boy queried.

"Gray whale, I reckon," answered the gunner.

"Devil-whale? Oh, Hank!" the boy cried, his eyes shining with excitement. "I hope it is!"

"That shows how little you know," the other replied.

"Are you going to harpoon him?"

Hank looked at the boy, smiling slightly at his utter fearlessness.

"I wish you were aboard the ship," he said, "an' I would. But I reckon it's wiser to keep out of trouble."

"But I don't want to be on the *Gull*," Colin protested; "at least not when there's anything going on out here. And," he added craftily, "I didn't think you were really afraid!"

"Wa'al," the old whaler said, his jaw setting firmly, "I don't want anybody to think I'm backin' down, just because I'm in a boat again. But I tell you straight, I don't like it. Gloomy," he continued, "an' the rest of you, stand by your oars. That's a gray whale an' I'm goin' after him."

"How do you know it's a California whale, Hank?" asked the boy, as they waited for the creature to reappear.

"By the spout," was the prompt reply. "It's not as high an' thin as a finback's, it's not large enough for the low, bushy spout of a humpback, an' it goes straight up instead of at a forward angle so it can't be a sperm. Must be a gray whale, can't be anythin' else."

For a few minutes the men rested on their oars, and Colin grew restless.

"Why doesn't he come up again?" he said impatiently. "First thing we know he'll be out of sight!"

The old whaler smiled again at the lad's eagerness.

"While the gray is the fastest swimmer of all the whales," he said, "you needn't be afraid that we'll lose sight of him. Most whales swim very slow, not much faster than a man can walk."

"There he is," called another of the sailors, pointing to a spout three or four hundred yards away.

"All right, boys," Hank said, "he's makin' towards the shore."

The long oars bit into the water again and Colin was glad to feel the boat moving, for it rolled fearfully on the long heaving swell. But with six good oars and plenty of muscle behind them, the little craft was not long in reaching the place where the 'slick' on the water showed that the whale had come up to breathe and then dived again. Acting under the gunner's orders the crew rested on their oars a short distance beyond the place where the whale had sounded. Presently, a couple of hundred yards from the boat, on the starboard side, the whale came up to spout, evidently having turned from the direction in which it had been slowly traveling, and the rowers made for the new objective. This time there was another long wait.

"How long do they stay down, Hank?" asked the boy.

"No reg'lar rule about it," the whaler answered; "sometimes for quite a while, but I reckon ten to fifteen minutes is about the usual. Some of 'em can stay down a long while sulkin' when they've

got a harpoon or two in 'em, but I reckon three-quarters of an hour would be about the limit."

Again the boat sped onward, this time without any order from Hank, for all hands had seen the whale not more than fifty yards away, and Hank grasped the shoulder harpoon-gun. But before the boat could reach the whale and turn stern on so as to give the gunner a good chance for a shot, the whale had 'sounded' or dived.

"Next time," said Hank quietly, and told Scotty, one of the sailors, to clear away the first few coils of the rope in the barrel and make sure that it was free from tangles.

Colin noticed that the three places where the whale had spouted formed a slight arc and that Hank was directing the boat along a projection of this curve, so he was quite ready when a command came to stop rowing. Then, at the whaler's orders, the boat was swung round and the men held their oars ready to back-water.

The place could not have been picked out with greater accuracy if the whaler had known the exact spot where the big cetacean was going to appear. Within thirty feet of the boat the water began to swirl and boil.

"He's right there!" said Colin with a thrill of expectation not wholly devoid of fear.

In obedience to a wave of the old whaler's hand, the boat went astern slowly and fifteen seconds later the great back appeared near the surface and the monster 'blew,' his pent-up breath escaping suddenly when he was still a foot below the surface, and driving up a column of mixed water and air, the roar sounding like steam from a pipe of large size.

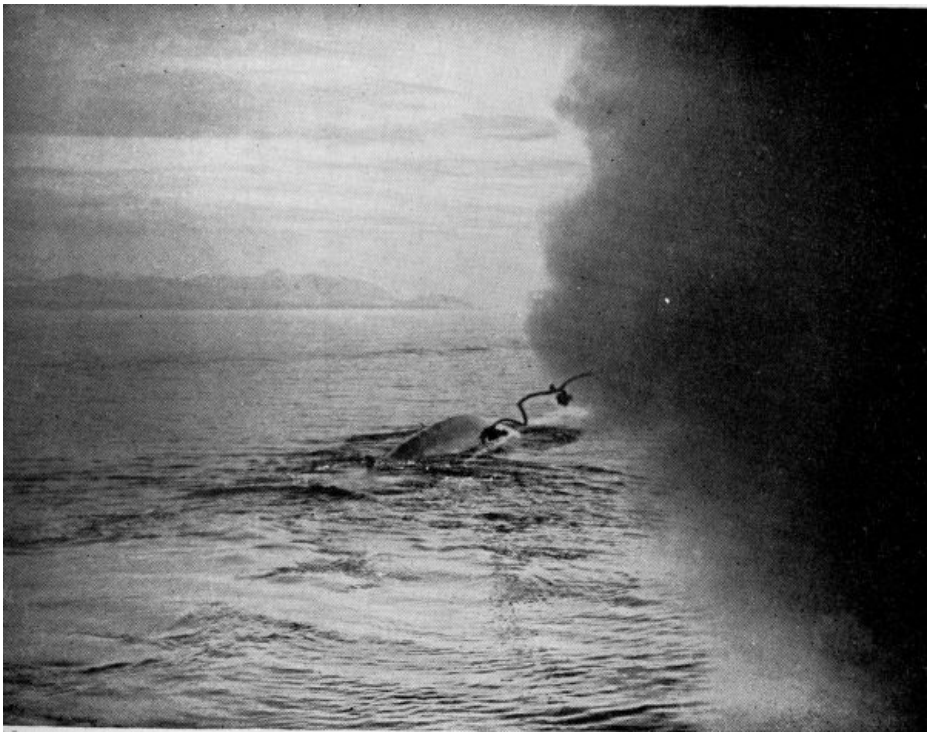
"Stand by the line, Scotty!" shouted Hank, as he raised the clumsy harpoon-gun to his shoulder.

The sailor who had been standing near the barrel nodded, as he drew his sheath-knife from its sheath, holding it between his teeth, ready to cut the line should a tangle occur, but keeping his hands free to attend to the coils of rope. To Colin the seconds were as years while the old whaler held the gun raised and did not fire. It seemed to the boy as if he were never going to pull the trigger, but the old gunner knew the exact moment, and just as the whale was about to 'sound' the back heaved up slightly, revealing the absence of a dorsal fin, and thus determining that it was a devil-whale in truth; at that instant Hank fired.

With the sudden pang of the harpoon the whale gave an upward leap for a dive and plunged, throwing the flukes of the tail and almost a third of his body out of water, and sounded to the bottom, taking down line at a tremendous speed. The line ran clear, Scotty watching every coil, and though the heavy rope was soaking wet, it began to smoke with the friction as it ran over the bow.

Whale Harpoon Gun loaded and being turned so as to point at the Whale.

Photograph by permission of Mr. Roy C. Andrews.



Finback Whale being struck with the Harpoon; the instant of discharge.

A remarkable photograph, scores of plates having been used in the effort to catch the exact moment. Note the wadding in the air, the smoke, the head of the harpoon, and the slick on the water as the whale sounded.

Photograph by permission of Mr. Roy C. Andrews.

"Fifty fathom!" cried Scotty, as the line flew out.

"Sixty!" he called a moment later, and then, immediately after,

"Seventy—and holding!"

As the pressure of the brake on the line tightened, the boat began to tear through the water, still requiring the paying out of the rope. For an instant it slackened and the winch reeled in a little line. There was a sudden jerk and then the line fell slack. Working like demons, the men made the winch handles fairly fly as the line came in, and within another minute the whale spouted, blowing strongly and sounding again. He sulked at the bottom for over twenty minutes, coming up suddenly quite near the boat. Scotty had lost no time, and not more than thirty-five fathom of line was out when the monster rose.

"He's a big un, Hank!" called Scotty. "Want the other line?"

"Got it!" was the brief reply, and Colin saw that the harpoon-gun had been reloaded.

"Sounding again!" called Scotty as the rope fell slack.

"No!" yelled Hank. "Stand by, all!"

Then suddenly:

"Back oars! Back, you lubbers! Hard as you know how!"

The oars bent like yew-staves.

"Back starboard! Hard!"

With the blood rushing to his brain, Colin, who was on the starboard side of the boat, threw his whole energy into the back stroke, and the boat spun round like a top into what seemed to be the seething center of a submarine volcano, for, with a roar that made the timbers of the boat vibrate, the gray whale spouted not six feet from where the boy was sitting. Dimly he saw the harpoon hurtle through the spray and the sharp crack of the explosion sounded in his ear.

Catching his breath chokingly, Colin was only conscious of the fact that he was expected to pull and he leapt into the stroke as the six oars shot the boat ahead.

Not soon enough, though! For, as the boat plunged from the crest of a wave the whale swirled, making a suction like a whirlpool into which the craft lurched drunkenly. Then the great creature, turning with a speed that seemed incredible, brought down the flukes of his tail in the direction of the boat, snapping off the stroke oar like a pipe-stem. Avidsen, the oarsman, a burly Norwegian, though his wrist was sharply and painfully wrenched by the blow, made no complaint, but reached out for one of the spare oars the boat always carried.

Colin was not so calm. Despite his courage, the shock of that tremendous tail striking the water within arm's-length of the boat had shaken his nerve, and the sudden drenching with the icy

waters of Behring Sea had taken his breath away. But he was game and stuck to his oar. Looking at Hank, he saw that the old fighter of the seas had dropped the harpoon-gun and was holding poised the long lance.

This was hunting whales with a vengeance!

The monster had not sounded but was only gathering fury, and in a few seconds he came to the surface with a rush, charging straight for the boat.

"Stand by to pull," said Hank quietly.

The two forward oars, watching, dipped lightly and moved the boat a yard or two, then waited, their oars in the water and arms extended for the stroke. Colin would have given millions, if he had possessed them, to pull his oar, to do something to get away from the leviathan charging like an avenging fury for the little boat. But Hank stood motionless. Another second and Colin could almost feel the devil-whale plunging through the frail craft, when Scotty suddenly yelled,

"Pull!"

As Scotty yelled, Colin vaguely—for everything seemed reeling about him—saw Hank lunge with the long steel lance. The suction half whirled the boat round, but the whale sounded a little, coming up to the surface forty feet away and spouting hollowly. Even to the boy's untrained ear there was a difference, and when he noticed that blood was mixed with the vapor thrown out from the blowhole, his hope revived. The second rush of the whale was easily avoided, and Hank thrust in the lance again. Then, for the first time, the old whaler permitted himself to smile, a long, slow smile.

"That's the way it used to be done in the old days!" he said, with just a shade of triumph in his voice. "Pull away a little, boys, to be clear of the flurry. Have you a buoy ready, Scotty?"

The sailor nodded.

"There won't be much of a flurry, Hank," he said; "you got the lungs with the lance both times."

The old whaler looked at Colin, who was a little white about the lips.

"Scared you, I reckon?" he said. "You don't need to feel bad over that. Any one's got a right to be scared when a whale's chargin' the boat. I've been whalin' for nigh on forty-five years an' that's only the second devil-whale I've ever killed with a hand-lance. He pretty near caught us with his flukes that first time, too!"

"Guess that's the end of him," said Scotty, as the big animal beat the air with his tail, the slap of the huge flukes throwing up a fountain of spray.

"That's the end," agreed Hank.

Almost with the word the great gray whale turned, one fin looming above the water as he did so, and sank heavily to the bottom, the buoy which had been attached to the harpoon-line by Scotty showing where he sank, so that the ship could pick up the carcass later.

"How big do you suppose that whale was?" queried the boy as they started to pull back to the ship.

"'Bout forty-five foot, I reckon," was the reply, "an' we ought to get about twenty barrels of oil out of him."

"That ought to help some," said Colin, "and you see my coming didn't hurt anything. Just think if I had missed all that fun!"

"It turned out all right," the old whaler said, "but I tell you it was a narrow squeak. They'll have been worryin' on board, though, if any one has been able to see that we were hitched up to a gray whale."

"Isn't there any danger with other whales?"

"Wa'al, you've got to know how to get at 'em, of course. But all you've got to do is to keep out o' the way. There's no whale except the California whale that'll charge a boat. I did know one chap that was killed by a humpback, but that was because the whale come up suddenly right under the boat and upset it—they often do that—an' when one of the chaps was in the water the whale happened to give a slap with his tail an' the poor fellow was right under it."

Colin was anxious to start the old whaler on some yarns of the early days, but as the boat was nearing the ship he decided to wait for an opportunity when there would be more time and the raconteur would have full leeway for his stories.

"Forty-five-footer, sir," called Hank, as they came up to the ship. "Gray devil, sir."

The captain lifted his eyebrows in surprise, for he had not thought of a California whale so far north, but he answered in an offhand way:

"More sport than profit in that. Did you have a run for your money, Colin?"

"I certainly did, Captain Murchison," the boy answered.

"All right, tell me about it some time. Hank, you're on board just in the nick of time. I found out what the trouble was with the carriage of the gun and repaired it while you were amusing yourselves out there. Get in lively, now, there's work to do."

The men scrambled on board rapidly, and the boat was up in the davits in less than a minute, while the yards were braced round, and under sail and steam the *Gull* headed north.

"There's four whales in sight, Hank," said the captain; "humpbacks, I think, and two of them big ones."

"If they'll bunch up like that, sir," the gunner said, "we may make a good trip out of it yet."

"I hope so," the skipper answered, and turning on his heel, he went to the poop. Thither Colin followed him and told him all the story of the whale. The captain, who was an old friend of Colin's father when they both lived in a lumbering town in northern Michigan, was greatly taken aback when he found how dangerous the boat-trip had been, but he did not want to spoil the boy's vivid memories of the excitement.

"I suppose," he said, "that you want to go out as gunner next time."

Colin shook his head.

"I'm generally willing to try anything, Captain Murchison," he replied, "but I'm content to let Hank look after that end."

"Hank's an unusual man," the captain said quietly. "I rather doubt if any other man on the Pacific Coast could have won out with a gray whale. I'd rather have him aboard than a lot of mates I know, and as a gunner, of course, he's a sort of petty officer."

The canvas began to shake as the boat turned on its course after the whales, catching the skipper's eye, and he roared out orders to shorten sail.

"Clew up fore and main to'gans'ls," he shouted; "take in the tops'ls. Colin, you go and furl the fore to'gans'l, and if the men are still busy on the tops'l yards, pass the gaskets round the main to'gans'l as well."

"Aye, aye, sir," the boy answered readily, for he enjoyed being aloft, and he clambered up the shrouds to the fore-topgallant yard and furled the sail, taking a pride in having it lie smooth and round on the top of the yard.

"What's the difference between a 'finback' and a 'humpback,' Hank?" asked the boy, after the canvas had been stowed, the vessel under auxiliary steam having speed enough to keep up with the cetaceans, "are they 'right' whales?"

"Neither of 'em," the gunner replied: "there's two kinds of right whale, the bowhead and the black, and both have fine whalebone, an' that, as you know, is a sort of strainer in the mouth that takes the place of teeth. Humpbacks an' finbacks are taken for oil, an' they look quite different. A humpback is more in bulk an' has only a short fin on the back, it's a clumsy beast an' throws the flukes of the tail out of the water in soundin'. Now, a finback is built more for speed an' has a big fin on the back—that's where it gets its name. The big sulphurbottom is a kind of finback, an' is the largest animal livin'. I've seen one eighty-five feet long!"

"Where does the sperm whale come in?" asked Colin.

"It's got teeth, like the gray whale," was the reply, "but you never find it in cold water. Sperm whalin' is comin' into favor again. But those two over there—the ones we're after, are finbacks. You can tell by the spout, by the fin, by not seein' the flukes of the tail, an' by the way they play around, slappin' each other in fun."

Three hours were spent in the fruitless chase after this little group of whales. Then Hank, who had been standing in the bow beside the gun, watching every move of the cetacean during the afternoon, suddenly signaled with his hand for "full speed astern," by this maneuver stopping the ship squarely, as a whale—a medium-sized finback—came up right under the vessel's bow. The reversed screws took the craft astern so as to show the broad back about twenty-five feet away, and Hank fired.

The crashing roar of the harpoon-gun was followed by a swirl as the whale sounded for a long dive, but a moment later there came a dull, muffled report from the water, the explosive head of the harpoon, known as the 'bomb,' having burst. For a minute or two there was no sound but the swish of the line and the clank of the big winch as it ran out, while the animal sank to the bottom. There was a moment's wait, and then Hank, seeing the line tauten and hang down straight, called back:

"We can haul in, sir; I got him just right."

Compared to the excitement of the chase in the open boat this seemed very tame to Colin, and he said so to the captain, when he went aft, while the steam-winch gradually drew up the finback whose end had come so suddenly.

"My boy," was the reply, "I'm not whaling for my health. Other people have a share in this, besides myself and the crew, and what they're after is whales—not sport. The business isn't what it was; in the old days whale-oil was worth a great deal and whaling was a good business. Then

came the discovery of petroleum and the Standard Oil Company soon found out ways of refining the crude product so that it took the place of whale-oil in every way and at a cheaper price."

"But I thought whalebone was what you were after!" said Colin in surprise.

"It was for a time," the captain answered, "after the oil business gave out. But within the last ten years there have been so many substitutes for whalebone that its value has gone down. There's a lot of whalebone stored in New Bedford warehouses that can't be sold except at a loss."

"Well, if the oil is replaced and whalebone has no value, what is to be got out of whaling now, then?" the boy queried.

"Oil again," was the reply; "for fine lubricating work there's nothing as good. It's queer, though, how things have changed around. Fifty years ago, New Bedford was the greatest whaling port in the world, ten years ago there wasn't a ship there, they had all gone to San Francisco. Now 'Frisco is deserted by whalers, and the few in the business have gone back to the old port."

In the meantime, while Colin had been telling the story of the adventure with the gray whale, and the captain had been bemoaning the decay of the whaling industry, the work of bringing the dead whale to the surface had been under way. Letting out more slack on the rope attached to the harpoon a bight of it was passed through a sheave-block at the masthead, thus giving a greater purchase for the lifting of the heavy body. The winch was run by a small donkey-engine, and for about ten minutes the line was hauled in, fathom after fathom being coiled on the deck. Presently, as Colin looked over the rail, the dark body of the whale was seen coming to the surface, and as he was hauled alongside a chain was thrown around his flukes, and the body was made fast to the vessel, tail foremost.

Just as soon as the whale was secured a sailor jumped on the body, carrying with him a long steel tube, pierced with a number of holes for several inches from the bottom. To this he attached a long rubber tube, while the other end was connected with a small air-pump. The ever-handy donkey-engine was used to work the pump, and the body of the whale was slowly filled with air in the same way that a bicycle tire is inflated.

"What's that for?" asked Colin, who had been watching the process with much curiosity.

"So that he will float," the captain answered. "You can't tow a whale that's lying on the bottom!"

"But I thought you were going to cut him up!"

"And boil down the blubber on board?"

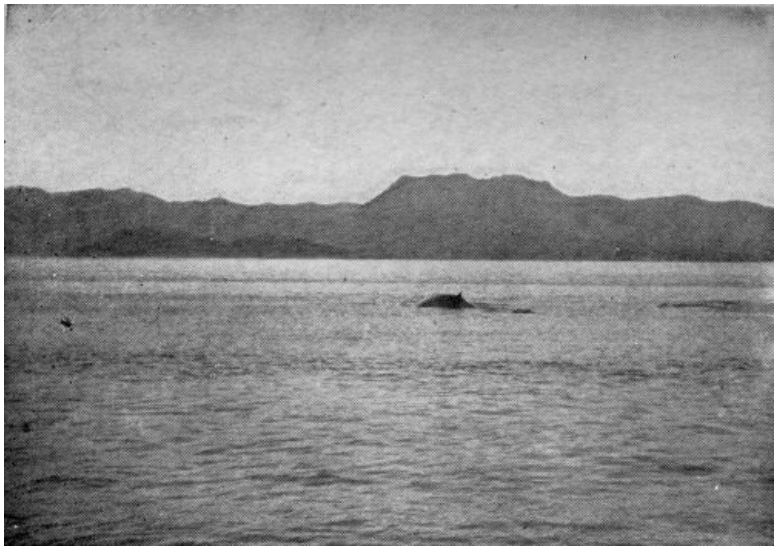
"Yes."

"That's very seldom done now," the captain explained. "In the old days, when whaling-ships went on three and four year voyages they 'fleshed' the blubber at sea and boiled it down or 'tried it out,' as they called it, into oil. They always carried a cooper along, too, and made their own barrels, so that after a long voyage a ship would come back with her hold full of barrels of whale-oil."

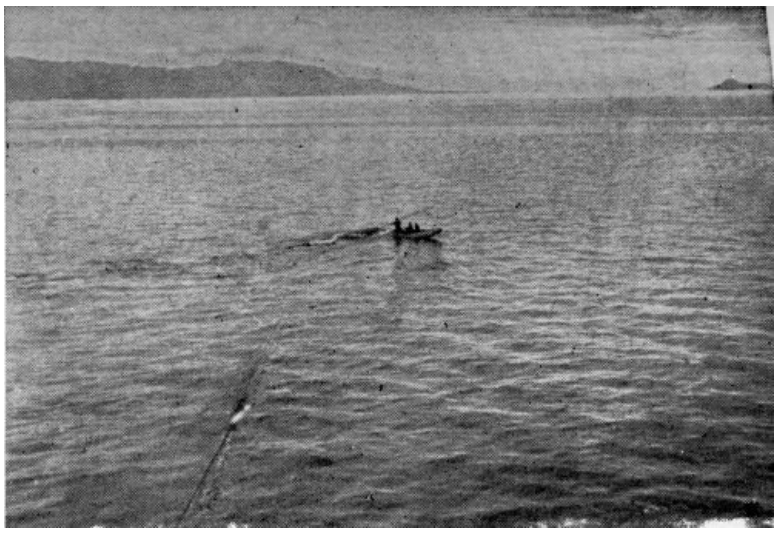
"What's the method now, Captain Murchison?" asked Colin.

"Nearly all whaling is done by steamers and not very far from the coast, say within a day's steaming. We catch the whales, blow them out in the way you see the men doing now, and tow them to the nearest 'trying out' factory. These places have conveniences that would be impossible on shipboard, they get a better quality of oil, and they use up all the animal, getting oil out of the meat as well as the blubber. Then the flesh is dried and sold for fertilizer just as the bones are. The fins and tail are shipped to Japan for table delicacies. Even the water in which the blubber has been tried out makes good glue. So, you see, it pays to tow a whale to the factory. And besides, the smell of trying out on one of the old whalers was horrible beyond description."

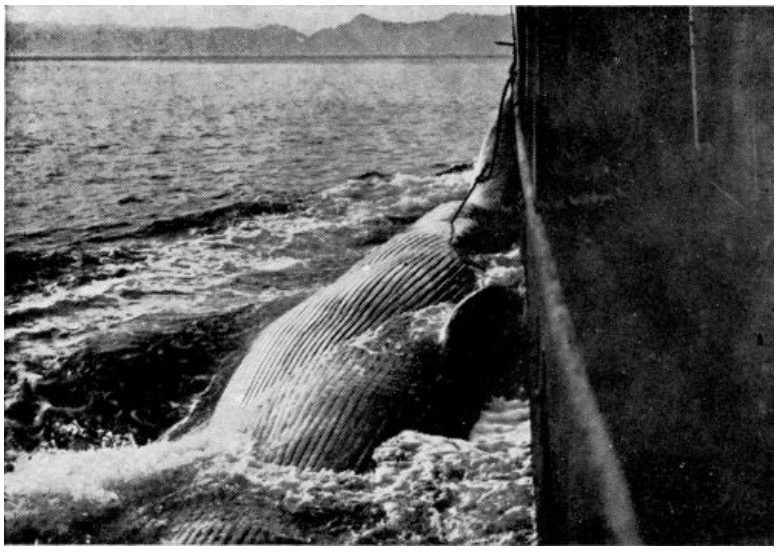
During this explanation the huge carcass of the whale had been distended to almost twice its natural size, and now it floated high out of the water. The steel tube was pulled out and a buoy with a flag was attached to the whale, which was then set adrift to be picked up and towed to the factory later.



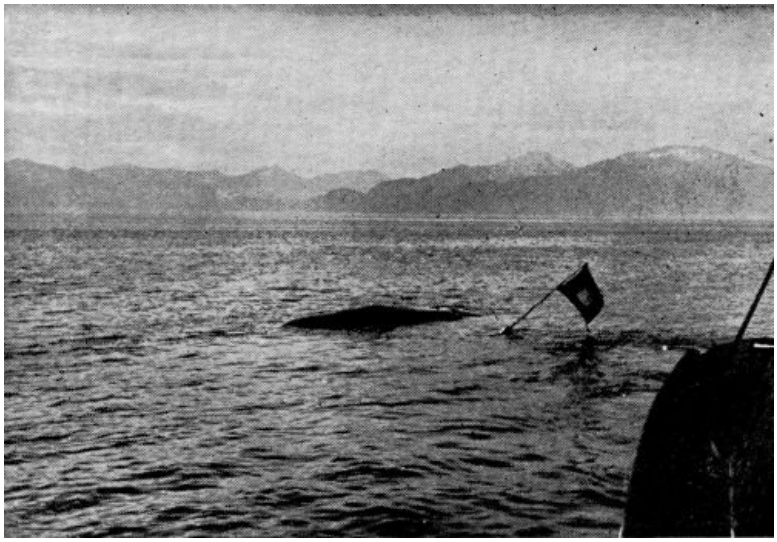
Finback Whale Sounding.



Lancing Finback: Giving the Death-blow.



Pumping Carcass with Air so that it will float.



Dead Finback Set Adrift with Buoy and Flag.

All Photos by permission of Mr. Roy C. Andrews.

Almost immediately the "tink-tink" of the bell of the signaler to the engine-room told that the ship was headed after another whale. The sea was rising and the wind was beginning to whistle through the rigging. Colin felt well satisfied that the canvas was stowed and that he would not have to go aloft during the night. The evening light, however, was still good enough for a shot, and Hank, at the bow, was swinging the heavy gun from side to side on its stand to assure himself that it was in good condition.

Owing to the approaching darkness, there was no time to wait for an exact shot, and Hank fired at the big finback on the first opportunity. The ship was rolling and pitching, however, and the harpoon, instead of striking the big whale, went clear over her and into the water beyond, crashing into the side of a little calf whale not more than sixteen feet long, the weapon going almost through him.

Apparently unconscious of what had happened to her baby, the mother whale sounded and sounded deep, not coming up for nearly twenty minutes. When she rose, she was at least a quarter of a mile away, and Colin, who was standing by Hank in the bow, wondered why the ship did not go in pursuit.

"Why don't we chase her up?" he asked.

"She'll come lookin' for her calf," the old whaler answered, "an' as long as we stay near that she'll come up to us. Lots of whalers shoot the calves a-purpose, makin' it easier to get the old whales, but I don't hold with that. I've never done it. Shootin' this one was just an accident, but as long as the little chap is dead anyhow, we might as well make use of him."

Just as the old whaler had predicted, in less than five minutes the mother whale spouted, coming in the direction of the vessel. In less than five minutes more she spouted again, just a little distance from the calf. Not understanding what had happened, she swam around as though to persuade the little one to follow her, and as she circled round the calf she came within range of the harpoon-gun. It was far too dark to see clearly, but Hank chanced a shot. The sudden roar startled Colin.

"Did you get her?" he asked anxiously.

"I hit her, all right," the gunner answered with a dissatisfied air, "but not just where I wanted."

The boy thought it wonderful that he should have been able to hit the monster at all, so small a portion of the body was exposed and so heavily was the *Gull* pitching. The whale, instead of sounding directly, dived at a sharp angle and the line ran out like lightning.

"What's that, Hank?" asked Colin in a startled voice, pointing over to the water just below the little calf, which had been hauled in by hand alongside the ship.

"Killers, by all that's holy!" ejaculated the whaler. "They'll get every blessed whale we've landed to-day. Did you ever see such luck!"

"What are they after?" asked Colin, "the calf whale?"

"Yes, or any other of 'em. See, the mother has smelt 'em and knows they mean harm for the baby."

It was growing dark and Colin leaned over the rail to see. Suddenly up from the deep, with a rush as of a pack of maddened hounds, ten or a dozen ferocious creatures, from fifteen to twenty feet in length, snatched and bit and tore at the body of the baby whale. A big white spot behind each eye looked like a fearful organ of vision, their white and yellowish undersides and black backs flashed and gleamed and the big fins cut the water like swords. The huge curved teeth gleamed in the reddened water as the 'tigers of the sea' lashed round, infuriated with lust for blood.

Then with a violent gesture of reminder, as though he had forgotten that which was of prime importance, Hank took a few quick steps to the rope that held fast the baby whale to the ship and cut it with his sheath-knife.

"What's that for?" said Colin.

"Let's get away from here," Hank replied, and signaled to go ahead.

As he did so, the mother whale caught sight of the remains of the body of the little one sinking through the water and dashed for it. Colin could have shouted with triumph in the hope that vengeance would be served out upon the orcas, but he was not prepared for the next turn in the tragedy. Like a pack of ravening wolves the killers hurled themselves at the mother whale, three of them at one time fastening themselves with a rending grip upon the soft lower lip, others striking viciously with their rows of sharp teeth at her eyes. The issue was not in doubt for a minute. No creature could endure such savage ferocity and such united attack. The immense whale threshed from side to side, always round the vessel, which seemed still to carry to her the scent of the baby whale.

"Has she any chance?" the boy asked, full of pity for the victim of such rapacity.

"Not the ghost of a chance," the whaler answered.

For a minute or two the whale seemed to have thrown off her demon foes and turned away, but scarcely a moment was she left alone, for up in front of her again charged five or six killers, rending and tearing at her head, and the whale, blinded, gashed in a thousand places and maddened by fear and pain, fled in the opposite direction.

Colin heard the captain give a wild cry from the poop and felt the engines stop and reverse beneath him. He cast one glance over the rail and like every man on board was struck motionless and silent. In the phosphorescent gleams of the waves churned up by the incredible muscular power of the killers, the old whale—sixty feet in length at least, and weighing hundreds of tons—was rushing at a maddened spurt of fifteen or even twenty miles an hour straight for the vessel's side, where a blind instinct made her believe her calf still was to be found. There was a death-like pause and then—a shock.

Almost every man aboard was thrown to the deck, and the vessel heeled over to starboard until it seemed she must turn turtle. But she righted herself, heavily and with a sick lurch that spoke of disaster. The ship's carpenter ran to the pumps and sounded the well.

"Four inches, sir!" he called.

A moment later he dropped the rod again.

"Five and a half inches, sir," he cried, "an' comin' in fast."

It hardly needed the carpenter to tell the story, for the ship had a heavy list to starboard. In a minute or two the stokers came up from below and close upon their heels, the engineer.

"The water is close to the fire-boxes, Captain Murchison," he said.

"I know, Mr. Macdonald," the captain answered. "Boat stations!" he cried.

"I'm thinkin'," the engineer said quietly, looking at the windy sky and stormy sea, the last streaks of twilight disappearing in the west, "I'm thinkin' it may be a wee bit cold. Are we far from land, Captain?"

"We're none too close," the skipper said shortly. "Cook," he called, "are the boats provisioned?"

"Yes, sir," was the reply.

"Water-casks in and filled?"

Every boat reported casks in good condition.

"Sound the well, carpenter."

The sounding-rod was dropped and the wet portion measured.

"Nine inches, sir."

"You've got time to get what you want from below, boys," said the captain, as soon as the boats were all swung out on the davits; "she won't go down all of a hurry. Slide into warm clothes, all of you, and get a move on. Stand by to clear."

He waited a minute or two, then noticed one of the sailors busy on deck.

"What are you doing there, Scotty?" he called out.

"Putting a buoy on the line, sir; she's our whale."

"Looks to me more as though the whale had us, than we had the whale," the captain said grimly. "Are you all ready?" he added as the men came up from the fo'c'sle in oilskins and mittens. "No, there's only fifteen of you!"

"I'm here, Captain Murchison," spoke up Colin, emerging from the companion hatch with a heavy

pilot coat. "I thought you'd need something for the boats, too."

The captain nodded his thanks.

"Lower away the whale-boat first," the captain said. "Never mind me, I'll come along presently. Look alive there! That's the idea, Hank! All right? Cast off. Lower away the big pram! All right. Get busy on that small pram, there. Here you, Gloomy, if I have to come down there——! All ready? Lower away. If you don't manage any better than that you'll never see land, I can tell you. Cast off."

The *Gull* was rolling heavily with an uneven drunken stagger that told how fast she was filling, and the starboard rail was close to the water's edge. The captain ran his eye over the boats and counted the men to see that all had embarked safely.

"Don't bring her too close, Hank!" he cried warningly, as he saw the old whaler edge the boat toward him, and stepping on the poop-rail, he jumped into the sea. But the gunner, judging accurately the swell of the waves, brought the boat to the very spot where the captain had struck the water and hoisted him on board. Without a word he made his way to the stern and took the tiller.

The boat pulled away a score of strokes or so and then the men rested on their oars. The sunset colors had faded utterly but a dim after-glow remained, and overhead a young moon shone wanly through black wisps of scudding cloud. The *Gull* sank slowly by the bow.

"She's one of the last of the old-timers," said the captain sadly. "This was her seventieth whaling season and that's old age for ship as well as man. I wish, though——"

"What is it, Captain Murchison?" asked Colin.

"Ah, it's nothing, boy," was the reply. "Only we're foolish over things we love, and the *Gull* was all that I had left. It's a dark and lonely death she's having there. I wish——"

"Yes, sir?" the boy whispered.

"I wish she'd had her lights," the captain said, and his hands were trembling on the tiller, "it's hard to die in the dark."

For a moment Colin had a wild idea of leaping into the sea and swimming to the sinking craft, and blamed himself bitterly for not having looked after the port and starboard lights at sundown, as he often did when the watch on deck was too busy to see to them. He would have given anything to have done it, rather than to have to sit beside the captain with his eyes fixed on the desolate unlighted ship! Boy though he was, he nearly broke down.

"Good-by, *Gull*, good-by," he heard the captain whisper under his breath.

Then, as if the ache in the boy's heart had been a flame to cross the sea, it seemed that a tiny spark kindled upon the sinking ship, and the captain, speechless for the moment, pointed at it.

"Is that a light, boy?" he said hoarsely, "or am I going mad?"

Like a flash, Colin remembered.

"It's the binnacle, sir," he cried; "I lighted it for the man at the wheel myself."

Solemnly the captain took off his hat.

"It's where the light should be," he said at last, "to shine upon her course to the very end."

CHAPTER II

THE FIGHT OF THE OLD BULL SEALS

The quick, uneasy pitching of the boat and a sudden dash of ice-cold spray roused the captain from the fit of abstraction into which the sinking of his ship had plunged him.

"Step the mast, men," he said; "we've got to make for the nearest land. It's going to be a dirty night, too."

"Did you want us to put a reef in, sir?" asked the old whaler.

"When I want a sail reefed," the captain answered shortly, "I'll tell you."

As the mast fell into place and the sail was hoisted, the whale-boat heeled sharply over and began to cut her way through the water at a good speed, leaving the two prams far in the rear. The captain, who was steering mechanically, paid no heed to them, staring moodily ahead into the darkness. Hank looked around uneasily from time to time, then in a few moments he spoke.

"The mate's signaling, I think, sir," he said.

Colin looked round but could only just see the outline of the larger of the two boats, and knew it

was too dark to distinguish any motions on board her. He looked inquiringly at Hank, but the old gunner was watching the captain.

"What does he want?" questioned the captain angrily.

"Orders, sir, I suppose," the whaler answered.

The captain felt the implied rebuke and looked at him sharply, but although he was a strict disciplinarian, he knew Hank's worth as a seaman of experience and kept back the sharp reply which was upon his lips. Then turning in his seat he realized how rapidly they had sped away from the boats they were escorting, and said:

"I'll bring her up."

He put the tiller over and brought the whale-boat up into the wind, and in a few minutes the mate's boat and the smaller pram came alongside.

"Don't you want us to keep together, sir?" cried the mate as soon as he was within hearing.

"Of course," the captain answered. "You can't keep up, eh?"

"Not in a breeze like this, sir," the mate declared.

"All right, then," was the response; "we'll reef." He nodded to the gunner and the reef points were quickly tied, thus enabling the three boats to keep together.

As the night wore on the wind increased until quite a gale was blowing, and the whale-boat began to plunge into the seas, throwing spray every time her nose went into it. The oilskins shone yellow and dripping in the feeble light of a lantern and although it was nearly the end of June a cold wind whipped the icy spume-drift from the breaking whitecaps.

"Doesn't feel much like summer, Hank!" said Colin, shivering from cold and fatigue, also partly from reaction following his exciting adventure with the gray whale.

"Behring Sea hasn't got much summer to boast of," the old whaler replied; "leastwise not often. You may get one or two hot days, but when the sun goes down the Polar current gets in its work an' it's cold."

"Where do you suppose we're going, Hank?" the boy asked, with a firm belief that the old whaler knew everything. "I don't like to bother Captain Murchison."

"Nor I," the gunner answered, looking toward the stern of the boat; "let him fight his troubles out alone. As for where we're goin', I don't know. I can't even see the stars, so I don't know which way we're headin'."

"Do you suppose we'll strike Alaska?" Colin queried. "Or perhaps the north of Japan? Say, it would be great if we fetched up at Kamchatka or somewhere that nobody had ever been before!"

The lad's delight in the thought of landing at some inhospitable northern island off the coast of Asia was so boyish that in spite of the discomfort of their present position, the old whaler almost laughed outright.

"Japan's a long ways south of here," he said. "We'd strike the Aleutian or the Kuril Islands before we got near there. I reckon we ought to try for some place on the Alaska coast, but as I remember, the wind was dead east when we left the *Gull* an' I don't think it's changed much."

Colin gave a long yawn and then shivered.

"I wouldn't mind being in my berth on the *Gull*!" he said longingly; "I'm nearly dead with sleep."

"Why don't you drop off?" Hank advised. "There's nothin' you can do to help. Here, change places with me an' you won't get so much spray."

"But you'll get it then!" the boy protested.

"If I had a dollar for every time I've got wet in a boat," the old whaler answered, "I wouldn't have to go to sea any more."

He got up and made Colin change places.

"Are you warmer now?" he asked a minute or two later.

"Lots," the boy murmured drowsily, and in a few seconds he was fast asleep. The old whaler gently drew the boy towards him, so that he would be sheltered from the wind and spray, and held him safe against the rolling and pitching of the little boat. The long hours passed slowly, and Colin stirred and muttered in his dreams, but still he slept on through all the wild tumult of the night, his head pillowed against Hank and the old whaler's arm around him.

He wakened suddenly, with a whistling, roaring sound ringing in his ears. Dawn had broken, though the sun was not yet up, and Colin shivered with the wakening and the cold, his teeth chattering like castanets. A damp, penetrating fog enwrapped them. Four of the sailors were rowing slowly, and the sail had been lowered and furled while he was asleep. Every few minutes a shout could be heard in the distance, which was answered by one of the sailors in the whale-boat.

"Where's the mate's boat, Hank?" asked the boy, realizing he had heard only one shout.

"She got out of hailin' distance, a little while before breakfast," the other answered, "but that doesn't matter so much, because she can't very well get lost now."

"But why is the sail down?"

The old whaler held up his hand.

"Do you hear that noise?" he asked.

"Of course I hear it," the boy answered; "that's what woke me up. But what is it?" he continued, as the roar swelled upon the wind.

"What does it sound like?" the gunner asked him.

The boy listened carefully for a minute or two and then shook his head.

"Hard to say," he answered. "It sounds like a cross between Niagara and a circus."

Scotty, who had overheard this, looked round.

"That's not bad," he said; "that's just about what it does sound like."

"But what is the cause of it, Hank?" the boy queried again. "I never heard such a row!"

"Fur seals!" was the brief reply.

"Seals?" said Colin, jumping up eagerly. "Oh, where?"

"Sit down, boy," interrupted the captain sternly; "you'll see enough of seals before you get home."

"All right, Captain Murchison," Colin answered; "I'm in no hurry to be home."

In spite of his recent loss the captain could not help a grim smile stealing over his face at the boy's readiness for adventure, no matter where it might lead. But he had been a rover in his boyhood himself, and so he said no more.

"Why, there must be millions of seals to make as much noise as that!" Colin objected.

"There aren't; at least, not now," was Hank's reply. "There were tens of millions of fur seals in these waters when I made my first trip out here in 1860, but they've been killed off right an' left, same as the buffalo. The government has to protect 'em now, an' there's no pelagic sealin' allowed at all."

"What's pelagic sealing?" asked Colin.

"Killing seals at sea," the whaler answered. "That's wrong, because you can't always tell a young male from a female seal in the water, an' the females ought never to be killed. But you'll learn all about it. Beg pardon, sir," Hank continued, speaking to the captain, "but by the noise of the seals those must be either the Pribilof or the Commander Islands?"

"Pribilof, by my reckoning," the captain answered. "Do you hear anything of the third boat?"

"No, sir," answered the old whaler, after shouting a loud "Ahoy!" to which but one answer was returned, "but we'll see her, likely, when the fog lifts."

"Doesn't lift much here," the captain said. "But with this offshore wind, they ought to hear the seals three or four miles away."

In the meantime the whale-boat was forging through the water slowly and the noise of the seals grew louder every minute. The sun was rising, but the fog was so dense that it was barely possible to tell which was the east.

"Funny kind of fog," said Colin; "seems to me it's about as wet as the water!"

"Reg'lar seal fog," Hank replied. "If it wasn't always foggy the seals wouldn't haul out here, an' anyway, there's always a lot of fog around a rookery. Must be the breath of so many thousands o' seals, I reckon."

Spearing Seals at Sea.

Pelagic sealing by Aleut natives now forbidden by the governments of the United States, Great Britain, Russia, and Japan.

Courtesy of the U. S. Bureau of Fisheries.

"Pretty things, seals," said the boy.

"Where did you ever see any?" his friend queried.

"Oh, lots of places," Colin answered, "circuses and aquariums and places like that. I even saw a troupe of them on the stage once, playing ball. They put up a good game, too."

"Those weren't the real fur seals," Hank replied; "what you saw were the common hair seals, an' they're not the same at all. You can't keep fur seals alive in a tank!"

"There are two fur seals in the aquarium of the Fisheries Building at Washington," interposed the captain, "but those are the only two."

"There!" cried the boy, pointing at the water; "there's one now!"

"You'll see them by hundreds in a few minutes, boy," the captain said. "I think I make out land."

As he spoke, an eddy of wind blew aside part of the fog, revealing through the rift a low-lying island. Within a minute the fog had closed down again, but the glimpse had been enough to give the captain his bearings. The noise from the seal-rookery had grown deafening, so that the men had to shout to one another in the boat and presently—and quite unexpectedly—the boat was in the midst of dozens upon dozens of seals, throwing themselves out of the water, standing on their hind flippers, turning somersaults, and performing all manner of antics.

"Why don't we land?" asked Colin, as he noticed that the boat was running parallel with the shore instead of heading directly for it.

"Land on a seal-rookery?" said Hank. "Haven't you had trouble enough with whales so far?"

"Would seals attack a boat?" asked Colin in surprise.

"No, you couldn't make 'em," was the instant reply, "but I never heard of a boat landin' at a rookery. The row would begin when you got ashore."

Gradually the boat drew closer to the land, as close, indeed, as was possible along the rocky shore, and then the land receded, forming a shallow bay flanked by two low hills on one side and one sharper hill on the other. The captain rolled up his chart and headed straight for the shore.

"St. Paul, I reckon," said Hank, as the outlines of the land showed clearly, "but I don't jus' seem to remember it."

"Yes, that's St. Paul," the captain agreed. "It has changed since your time, Hank. There has been a lot of building since the government took hold."

"Why, it looks quite civilized!" exclaimed Colin in surprise, as he saw the well-built, comfortable frame houses and a stone church-spire which stood out boldly from the hill above the wharf.

"When I first saw St. Paul," said the old whaler, "it looked just about the way it was when the Russians left it—huts and shacks o' the worst kind an' the natives were kep' just about half

starved."

"It's different nowadays," said the captain as they drew near the wharf, putting under his arm the tin box that held the ship's papers. "The Aleuts are regular government employees now and they have schools and good homes and fair wages. Everything is done to make them comfortable. I was here last year and could hardly believe it was the same settlement I saw fifteen years ago."

It was still early morning when the boat was made fast to the wharf, and Colin was glad to stretch his legs after having slept in a cramped position all night. The damp fog lay heavily over everything, but the villagers had been aroused and the group of sailors was soon surrounded by a crowd, curious to know what had happened. Hank, who could speak a 'pigeon' language of mixed Russian and Aleut, was the center of a group composed of some of the older men, while Colin graphically described to all those who knew English (the larger proportion) the fight with the gray whale, and told of the sinking of the *Gull* by the big finback, maddened by the attack of the killers. He had just finished a stirring recital of the adventures when the other two boats from the *Gull* loomed up out of the fog and made fast to the wharf.

Hearing that the only breakfast the shipwrecked men had been able to get was some cold and water-soaked provender from the boat, two or three of the residents hurried to their homes on hospitable errands bent, and in a few minutes most of the men were thawing out and allaying the pangs of hunger with steaming mugs of hot coffee and a solid meal. So, when the captain came looking for Colin that he might take him to the Fisheries agent's house, he found the lad—who was thoroughly democratic in his ways—breakfasting happily with the sailors and recounting for the second time the thrills and perils of the preceding day.

Rejoining the captain an hour or so later at the house to which he had been directed, Colin was effusively greeted by the assistant to the agent, a young fellow full of enthusiasm over the work the Bureau of Fisheries was doing with regard to fur seals. A natural delicacy had kept him from troubling Captain Murchison, but as soon as he discovered that Colin was interested in the question and anxious to find out all he could about seals, he hailed the opportunity with delight.

"I've just been aching for a chance to blow off steam," he said. "It's an old story to the people here. Obviously! I don't think they half realize how worth while it all is. I'm glad to have you here," he continued, "not only so that we can help you after all your dangers, but so that I can show you what we do."

"I'm still more glad to be here," Colin replied, after thanking him. "I've been trying to persuade Father to let me join the Bureau, but this is such an out-of-the-way place that I never expected to be able to see it for myself."

"It is a little out of the way," the official replied. "But in some ways, I think it's the most important place in the entire world so far as fisheries are concerned. It's the one strategic point for a great industry. Of course!"

"Why is it so important, Mr. Nagge?" Colin queried. "Just because of the seals, or are there other fisheries here?"

"Just seals," was the reply, in the jerky speech characteristic of the man. "Greatest breeding-place in the world. You'll see. Nothing like it anywhere else. And, what's more, it's almost the last. This is the only fort left to prevent the destruction not of a tribe—but of an entire species in the world of life. Certainly!"

"Calling it a fort seems strange," Colin remarked.

"Well, isn't it? It's the heroic post, the forlorn hope, the last stand of the battle-line," the Fisheries enthusiast replied. "All the nations of the world were deliberately allowing all the fur seals to be killed off. Uncle Sam stopped it. It's not too late yet. The Japanese seal-pirates must be exterminated absolutely! Could you run a ranch if every time a steer or cow got more than three miles away from the corral anybody could come along and shoot it? Of course not. Obviously!"

"But this isn't a ranch!"

"Why not? Same principle," the assistant agent answered. "Ranchers breed cattle in hundreds or thousands. We breed seals in hundreds of thousands; yes, in millions. And a fur seal is worth more than a steer. Oh, yes!"

"Do seals breed as largely still?" Colin asked in surprise.

"Would if they had the chance," was the indignant answer. "Undoubtedly millions and millions have been killed in the last fifty years. Takes time to build up, too! Only one baby seal is born at a time. A run-down herd can't increase so very fast. But we're getting there. Certainly!"

"Our gunner was telling me," Colin said, "that killing seals at sea was the cause of all the trouble."

"Yes. Lately. Before that, rookery after rookery had been visited and every seal butchered. Old and young alike. No mercy. Worst kind of cruelty."

"But hasn't the sea trouble been stopped?" queried the boy. "I thought it had, but you said something just now about seal-pirates."

"Stopped officially," his informant said. "Can't kill a seal in the ocean, not under any

consideration. That is, by law. Not in American waters. Nor in Russian waters. Nor in Japanese waters. Nor in the open sea. International agreement determines that. Of course. But lots of people break laws. Obviously! Big profit in it. There's a lot of killing going on still. Stop it? When we can!"

"But how about killing them on land?" Colin asked. "You do that, I know, because I've read that the Bureau of Fisheries even looks after the selling of the skins. While it may be all right, it looks to me as though you were killing them off, anyhow. What's the good of saving them in the water if you wipe them out when they get ashore."

"You don't understand!" his friend said. "Got anything to do right now?"

"Not so far as I know," Colin answered.

"You've had breakfast?"

"Yes, thanks," the boy answered, "and I tell you it tasted good after a night in the boat."

"Come over to the rookery," the assistant agent said. "I'm going. I count the seals every day. That is, as nearly as I can. Tell you all about it. If you like, we'll go on to the killing grounds afterwards. Yes? Put on your hat."

Colin realized that his host seldom had a listener, and as he was really anxious to learn all that he could about the fur seals, these creatures that kept up the deafening roar that sounded like Niagara, he followed interestedly.

"Looks a little as if it might clear," he suggested, as they left the house. "We could stand some sunshine after this fog."

The other shook his head.

"Don't want sunshine," he said. "Fog's much better."

"What for?" asked Colin in surprise. "Why should any one want fog rather than sunshine?"

"Fur seals do," was the emphatic response. "No seals on any other groups of islands in the North Pacific. Just here and Commander Islands. Why?"

"Because they are foggier than others?" hazarded Colin at a guess.

"Exactly. Fur seals live in the water nearly all year. Water is colder than air. Seals are warm-blooded animals, too—not like fish. They've got to keep out the cold."

"Is that why they have such fine fur?"

"Obviously. And," the Fisheries official continued, "under that close warm fur they have blubber. Lots of it."

"Blubber like whales?"

"Just the same. Fur and blubber keeps 'em warm in the cold water. Too much covering for the air. Like wearing North Pole clothing at the Equator. If the sun comes out they just about faint. On bright days the young seals make for the water. Those that have to stay on the rookery lie flat on their back and fan themselves. Certainly! Use their flippers just the way a woman uses a regular fan. See 'em any time."

Colin looked incredulously at his companion.

"I'm not making it up," the other said. "They fan themselves with their hind flippers, too. Just as easy."

"I think they must be the noisiest things alive," said Colin, putting his fingers in his ears as they rounded the point and the full force of the rookery tumult reached them.

"The row never stops," the assistant agent admitted. "Just as much at night as daytime. Seals are used to swimming under water where light is dimmer. Darkness makes little difference. Seemingly! Don't notice it after a while."

"The queer part of it is," the boy said, listening intently, "that there seem to be all sorts of different noises. It's just as I said coming into the bay, it sounds like a menagerie. I'm sure I can hear sheep!"

"Can't tell the cry of a cow fur seal from the bleating of an old sheep," was the reply. "The pup seal 'baa-s' just like a lamb, too. Funny, sometimes. On one of the smaller islands one year we had a flock of sheep. Caused us all sorts of trouble. The sheep would come running into the seal nurseries looking for their lambs when they heard a pup seal crying. The lambs would mistake the cry of the cow seal for the bleating of their mothers."

"Why do you call the mother seal a cow seal?" asked the boy.

"Usual name," was the reply.

"Then why is a baby seal a pup?" asked Colin bewildered. "I should think it ought to be called a calf!"

The Fisheries official laughed.

"Seal language is the most mixed-up lingo I know," he said. "Mother seal is called a 'cow,' yet the baby is called a 'pup.' The cow seals are kept in a 'harem,' which usually means a group of wives. The whole gathering is called a 'rookery,' though there are no rooks or other birds around. The big 'bull' seals are sometimes called 'Sea-Catches' or 'Beachmasters.' The two-year-olds and three-year-olds are called 'Bachelors.' The 'pups,' too, have their 'nurseries' to play in."

But Colin still looked puzzled.

"Our gunner was talking about 'holluschickie'?" he said. "Are those a different kind of seal?"

"No," was the reply, "that's the old Russian-native name for bachelors. There are a lot of native words for seals, but we only use that one and 'kotickie' for the pups."

"If the cow seals bleat," said Colin, "and the pups 'baa' like a lamb, what is the cry of the beachmaster?"

"He makes the most noise," the agent said. "Never stops. Can you hear a long hoarse roar? Sounds like a lion!"

"Of course I can hear it," the boy answered; "I thought that must be a sea-lion."

"A sea-lion's cry is deeper and not so loud," his friend replied. "No. That roar is the bull seal's challenge. You're near enough to hear a sort of gurgling growl?"

"Yes," said Colin, "I can catch it quite clearly."

"That's a bull talking to himself. Then there's a whistle when a fight is going on. When they're fighting, too, they have a spitting cough. Sounds like a locomotive starting on a heavy grade. Precisely!"

"Do they fight much?" the boy asked.

"Ever so often!" his informant replied. "Can't you hear the puffing? That shows there's a fight going on. I've seldom seen a rookery without a mix-up in progress. That is, during the early part of the season after the cows have started to haul up. There's not nearly as much of it now, though, as there used to be."

"Could I see a fight?" the boy asked eagerly.

"Hardly help seeing one," was the reply. "Watch now. We're just at the rookery. Immediately!"

Turning sharply to the left, the older man led the way between two piles of stones heaped up so as to form a sort of wall, and shut off at the sea end.

"What's this for?" asked Colin.

"Path through the rookery. Want to count the seals every once in a while," the agent said. "Must have some sort of gangway. Obviously! Couldn't get near enough, otherwise."

"Why not?" queried Colin. "Would the beachmasters attack you?"

"They won't start it," was the reply. "Sea-catch keeps quiet unless he thinks you're going to attack his harem. About two weeks ago, I only just escaped. Narrow squeeze. Wanted to get a photograph of one of the biggest sea-catches I had ever seen. Took a heavy camera. The sea-catch didn't seem excited. Not particularly. So, I came up quite close to him."

"How close, Mr. Nagge?"

"Ten or twelve feet. Just about. I got under the cloth. Focused him all right. Then slipped in my plate. Just going to press the bulb when he charged. Straight for me. No warning. I squeezed the bulb, anyhow; grabbed the camera and ran. Promptly!"

"Did he chase you far?"

"A few yards. I knew there was no real danger. Best of it was that the plate caught the bull right in the act of charging! I've got a print up at the house. Show you when we get home!"

"I'd like to see it, ever so much," the boy answered.

As they came to a gap in the wall, the agent halted.

"There!" he said. "That's a rookery."

In spite of all that he had heard before of the numbers of seals, and although the deafening noise was in a sense a preparation, Colin was dazed at his first sight of a big seal rookery. For a moment he could not take it in. He seemed to be overlooking a wonderful beach of rounded boulders, smooth and glistening like polished steel; here and there pieces of gaunt gray rock projected above and at intervals of about every fifteen to forty feet towered a huge figure like a walrus with a mane of grizzled over-hair on the shoulders and long bristly yellowish-white whiskers. For a moment the boy stood bewildered, then suddenly it flashed upon him that this wonderful carpet of seeming boulders, this gleaming, moving pageantry of gray, was composed of living seals.

"Why, there are millions of them!" he cried.

Right from the water's edge back halfway to the cliffs, and as far as the eye could see into the white sea-mist, every inch of the ground was covered. Looking at those closest to him, Colin noticed that they lay in any and every possible attitude, head up or down, on their backs or sides, or curled up in a ball; wedged in between sharp rocks or on a level stretch—position seemed to make no difference. Nor were any of them still for a minute, for even those which were asleep twitched violently and wakened every few minutes. And over the thousands of silver-gray cow seals, the sea-catches, the lords of the harem, three or four times the size of their mates, stood watch and ward unceasingly.

"Why do you herd them so close together?" asked Colin. "I should have thought there was lots of room on the beaches of the island."

"They herd themselves," the agent said. "Don't go anywhere unless it is crowded. The more a place is jammed, the more anxious they are to get there. Newcomers won't go to empty harems. Unhappy with only one or two other cows. Try and find room in a crowded bunch where one sea-catch is looking after thirty females."

"But," said Colin, looking at the group which was nearest to him, "there are a lot of little baby seals in there! They'll get trodden on!"

"They are trodden on. Often," said the agent. "Can't be helped. Only a few pups right in the harems and they are all small. Obviously! Go away when they are a week old. Wander from the harem to find playfellows. Make up 'pods' or nurseries. Sometimes four or five hundred in one nursery. Stay until the end of the season. There's a pod of pups," he continued, pointing up the beach; "about sixty of them, I should judge. Happy-looking? Clearly!"

"They look like big black kittens," said Colin, as he watched them tumbling about on the pebbly beach, "and just as full of fun. Can they swim as soon as they are born, Mr. Nagge?"

"Seals have to learn to swim. Same as boys," he answered. "They teach themselves, apparently! Young seal, thrown into deep water, will drown. Queer. Become wonderful swimmers, too."

"About how long does it take them to learn?" Colin asked.

"Don't begin until they are three weeks old," was the reply. "Practise several hours a day. Swim well in about a month."

"Why don't the father or the mother seals teach them?" queried the boy.

"A sea-catch doesn't see anything outside the harem. As long as a pup is within twelve feet of him, he will fight on the instant if the baby is in danger. Once it is in the nursery the bull seal forgets the little one's existence. He couldn't leave, anyway. Some other sea-catch would seize the harem."

"You mean that the old seal can't get away at all?"

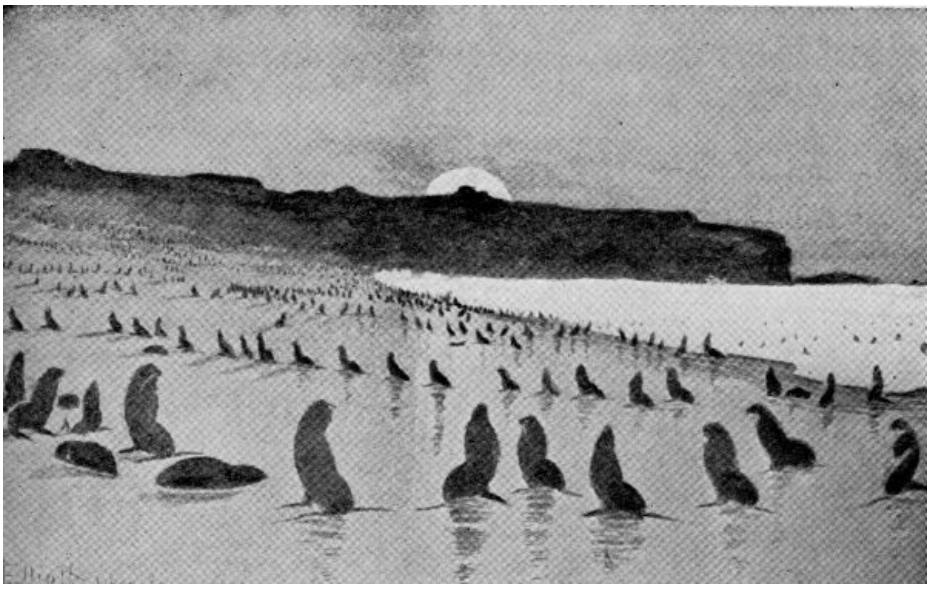
"Not at all," was the reply.

"Then what does he get to eat?" asked Colin in surprise, "do the cow seals bring him food?"

"Not a bite. No. He doesn't eat at all. Not all summer."

"Never gets a bite of anything? I should think he'd starve to death," cried the lad.

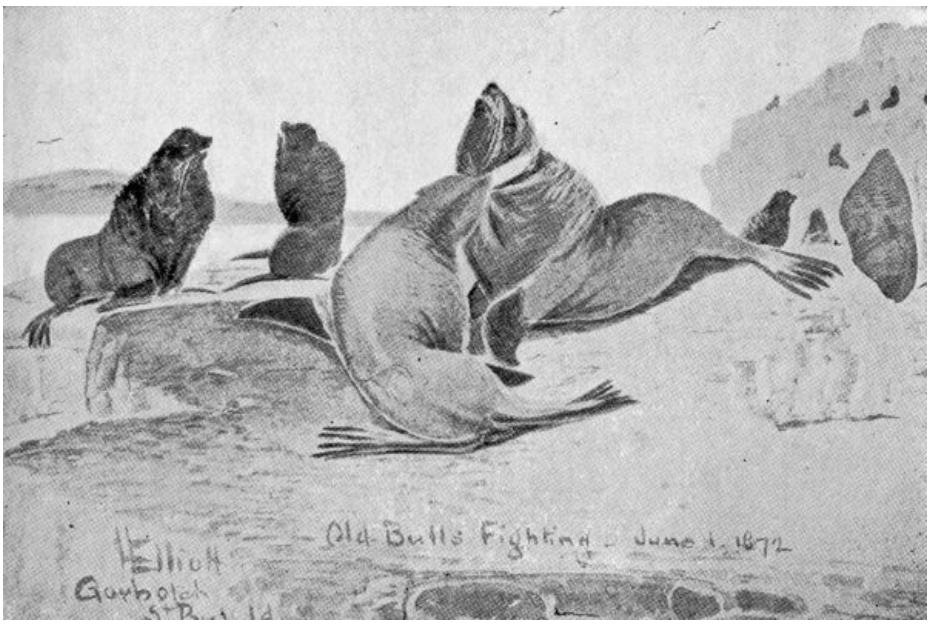
"Fasts for nearly four months. From the time a sea-catch hauls up in May and preempts the spot he has chosen for his harem he doesn't leave that spot eight to sixteen feet square until late in August. Stays right there. He's active enough in some ways. No matter how much he flounders around, he keeps right on his own harem ground. He could hardly get away from it if he tried."



Holluschickie Hauling up from the Sea.

Rare sketch, taken before ever a camera was seen on the Pribilof Islands. This beach, with many others, is now deserted by the depletion of the seal herd.

Courtesy of the U. S. Bureau of Fisheries.



Old Bull-Seals Fighting.

Rare sketch, taken on the Gorbatch Rookery, St. Paul's Island, forty years ago. These combats are growing rarer as the seal herd grows smaller and the rivalry between the beach-masters is less intense. The date on the sketch shows it to have been made before the cow-seals hauled up.

Courtesy of the U. S. Bureau of Fisheries.

"Why not?"

"He couldn't leave his own harem without getting into the next one. Obviously!" the agent promptly replied. "And he'd have to fight that beachmaster. Evidently! And so on every few feet he went. Besides, the very moment his back was turned a neighboring bull would steal some of his cows. Certainly! Or, an idle bull would try and beat him out."

"Which are the idle bulls?" asked Colin.

"Those fellows at the back who came late or were beaten in the fight for places. They would charge down and take the harem, if he left it."

"Well, then, how does he sleep?"

"Doesn't sleep much," was the reply; "just little catnaps. Five or ten minutes at a time, perhaps. Light sleepers, too. If a cow tries to leave or an intruder comes near he wakes right up. Immediately! He's on the alert, night and day." The agent laughed. "Eternal vigilance is the bull seal's motto, all right!"

"But how can they stand it without food and without sleep?" Colin asked. "That's over three months of fasting. And it isn't like an animal that's asleep all winter. It seems to be their busiest time, fighting and watching and all that sort of thing!"

"They live on their blubber," the agent explained. "In the spring they haul up heavy and fat. Can hardly move around they're so fleshy. It's the end of June now. You see! Many bulls are loaded with fat still. By the end of next month, though, they'll be getting thin. Some of 'em are like skeletons when they leave the rookeries in August. They'll fight to the end, though."

"But if they leave each other's harems alone," Colin objected, "I don't see any cause for a fight."

"The cows don't all come at the same time. Perhaps for six weeks there are cows coming all the time. Those beachmasters who have harems nearest the water want their family first and there's fighting all along the water's edge, then. Other cows have to make their way inshore; any of the sea-catches may grab them. Wait a minute and watch. You'll see the scramble going on somewhere. There are two bulls fighting there," he added, pointing to a combat in progress some distance off, "and there's another—and another."

"Is that one of the new cows just coming in from the water?" asked Colin, pointing to the shore, where a female seal, quietly and without attracting attention, had landed near one of the large harems.

"Yes," the agent said. "Just watch her a while. You'll see how the fighting begins."

Moving quietly and slowly and making just as little disturbance as possible, the incoming seal made her way through and over the recumbent seals, keeping as far as she could from the

beachmasters. Those huge monarchs of the waterside eyed her closely, but the harems were full to the last inch of ground and they let her pass, the cow seal remaining quiet as long as the beachmaster was watching, then creeping on a yard or two.

"She'll get caught by the next one," said Colin. "See, there's just about room enough in his harem for one more."

But the cow managed to make her way past, the old bull being engrossed in watching a neighboring sea-catch whom he suspected of designs upon his home. She had only succeeded in reaching a point about six harems inland, however, when a bull with a small group of only about twelve cows, suddenly reached out with his strong neck, grabbed her by the back with his sharp teeth and threw her on the rocks with the rest of his company. As the sea-catch weighed over four hundred pounds and the cow not more than eighty—the poor creature was flung down most cruelly.

"The brute!" cried Colin.

But for some reason the cow was dissatisfied with her new master and tried to escape. The old sea-catch made a lunge forward and caught her by the back of the neck, biting viciously as he did so, in such wise that the teeth tore away the skin and flesh, making two raw and ugly wounds.

Colin's indignation was without bounds.

"I'd like to smash that old beast!" he said, and if the agent had not been there to stop him the boy would have jumped over the low wall and gone to the assistance of the cow seal.

"That's going on all the time," the agent said. "You can't settle the affairs of ten thousand families. Not offhand that way. You'd be kept busy if you tried to fight the battles of every female that hauls up on St. Paul rookery."

"But see," cried Colin, "he's going after her again!"

This time the sea-catch was evidently angry, for he shook the cow as a dog does a rat and tossed her back into the very center of the harem, standing over her and growling angrily. The agent looked on tranquilly.

"There's going to be trouble," he said. "See that idle bull coming?"

He pointed to the back of the rookery, and Colin saw a sea-catch of good size, though not as large as the bull whose savage attack on the cow had excited Colin's resentment, come plunging down through the rookery with the clumsy lope of the excited seal. The cow squirmed from under the threatening fangs of her captor, but just as he was about to punish her still more severely, he caught sight of the intruder, and, with a vicious snap, he whirled round to the defense. The newcomer, though powerful, showed the dark-brown rather than the grizzled over-hair of the older bull, but while he had youth on his side, he was not the veteran of hundreds of battles.

Both stood upright for a moment, watching each other keenly, but with their heads averted, then the younger bull, with a forward movement so rapid that it could hardly be followed, struck downward with his long teeth to the point where the front flipper joins the body. It was a clever stroke, but the old bull knew all the tricks of warfare and turned the flipper in so that the teeth of his opponent only gashed the skin, and at the same time the old bull jerked his head up and sidewise, and sank his teeth deep into the side of the neck of the younger bull.

"He's got him, what a shame!" cried Colin, whose sympathies were all with the younger fighter.

The old sea-catch, paying no attention to the roaring and whistling of his wounded rival, kept his teeth fast-clenched in a bulldog-like grip and braced himself against the repeated lunges the other made to get free. There could be but one result to this and, with an agonized wrench, the younger bull pulled himself free—tearing out several inches of skin and leaving a gaping wound from which the blood streamed down.

But he was not defeated yet!

Facing his more powerful enemy, roaring unceasingly and with the shrill piping whistle of battle, the younger bull fairly swelled with exertion and rage until he seemed almost the size of his big foe, his head darted from side to side quick as a flash, and the revengeful, passionate eyes—so different from the limpid, gentle glance of the cow seals—flashed furiously as the blood poured down and reddened the rocks around him.

Again it was the younger bull who took the aggressive and, after a couple of feints, he reared and struck high for the face, just grazing the cheek of the older bull and pulling out several of the stiff bristles on which his teeth happened to close, springing back in time to escape the double sickle-stroke of the sea-catch. The old bull roared loudly and sprang forward, getting a firm hold of the younger by the skin behind the muscles of the shoulders. But he was a second too late, for as he closed his grip, the smaller fighter shifted and struck down, a hard clean blow, reaching the coveted point and half-tearing the flipper from the body.

Undeterred by the injury, though the pain must have been intense, the old bull threw his weight upon the younger, bending him far over as though to break the spine. Seals cannot move backward, and the smaller fighter was almost overbalanced. Then, seizing his chance, the old beachmaster let go his hold upon the other's back and got in a crashing blow at the same point

where he had torn open the neck before, this time sinking his teeth so far in that the muscle of the shoulder showed plainly, and an instant later, although there seemed scarcely time to strike a second blow, he swept down the body with his long, sharp teeth, catching the younger at the flipper-joint, and inflicting a wound almost exactly similar to that which he had received.

Quick as a flash, the younger combatant gave up the fight. But as he turned, instead of merely crawling away defeated, he made a sudden convulsive sprawl which the older bull was not expecting, and dug his teeth into the cow who had given rise to all the trouble, and lifted her bodily. The old beachmaster, his mane bristling with rage, made after him, but the younger bull, although he was forced to move on the stump of his wounded flipper, held fast to his prize, even when the victor inflicted a fourth fearful wound.

But before the old sea-catch could turn the plucky youngster, he saw two other bulls sidling towards his harem, intending to steal his cows while he was off guard, and he lumbered back to repel the new intruders. In the meantime, the young bull was attacked on his way to his own station by three other bulls near whose harems he had to pass, but he made no resistance and, though bleeding from a dozen wounds, he struggled on, leaving a gory trail in his wake, but gripping with grim determination the cow he had almost given his life to secure. When at last he reached his own station, he was a mass of blood from head to foot, his flesh was hanging from him in strips and one of his fore-flippers was dangling uselessly.

"He put up a plucky fight, anyway," said Colin, "even if he did get licked."

But it was for the poor cow seal that Colin felt the most sympathy. She lay upon the rocks where her second captor had thrown her, absolutely unconscious and seemingly almost dead, wounded in several places and covered with blood and sand, a wretched contrast to the pretty, gentle animal which the boy had seen emerge from the water not fifteen minutes before.

"It's a shame," Colin said, speaking a little chokingly. "I didn't know any animals could be so brutal."

The agent glanced at him quickly.

"The beachmasters are brutes," he said, "but mostly among themselves. Notice. The bull isn't even licking his wounds. He's pretty well used up, too. They're always too proud to show that they feel their hurts. Evidently! Even when they have been almost torn to pieces."

"Then you think he won't die?"

"Not a bit of it," the agent said cheerfully. "He'll be ready for another fight to-morrow."

"But how about the poor cow? She looks about dead now," said Colin.

"Not as bad as it looks! She's all right," his friend replied. "Those wounds don't go down into vital parts. They usually just reach the blubber. There isn't a sea-catch on the rookery that hasn't had from ten to twenty fights already this year. Most of 'em have been at it for several seasons. Yet you can hardly notice a scar on them. As for the mother seal, she will probably have a baby seal to-morrow. In a week the wounds will all have healed over. Cat may have nine lives, but a seal has ninety!"

CHAPTER III

ATTACKED BY JAPANESE POACHERS

"That's life on a rookery," the agent said. "Fight! Capture! More fight! But the holluschickie are different. Let's go to the hauling-grounds."

"Is that where the killing goes on?" the boy asked.

"Not quite," was the reply. "The road to the killing-grounds begins there, though. Naturally! We don't take any seals from a rookery."

"Why not?"

"No use! They are all either old bulls, females, or pups," was the answer. "The fur of the old sea-catches is coarse. Couldn't sell it. Never kill a cow seal under any circumstances. That's what all the trouble in killing seals at sea is about. You can't tell a holluschickie from a cow seal in the water. Cruel, too. When a cow seal is on her way to the rookery, she will have a baby seal in a few days."

"The holluschickie, then," said Colin, "don't come on the rookery at all?"

"Never! Absolutely! The bachelors, which are young male seals five years old and under, leave the rookery alone. The old sea-catches look after that. Certainly! It is mutilation or death for a holluschickie to put so much as a flipper on a rookery. They seldom try. Therefore, the hauling-grounds are at a distance. Obviously! Sometimes, though, it is impossible for the holluschickie to get to the sea without having to cross the rough, rocky ground which is suitable for a rookery."

"How can they work it, then?"

"The sea-catches leave a road eight feet wide, no more, no less. This path through the rookery gives just room for two holluschickie to pass. The beachmasters whose harems are on either side of this road watch them. They keep their lookout from a station right beside the road. If one of the holluschickie touches a cow on either side of this clear road-space, he will be attacked savagely."

"But I should think he could get away easily enough," Colin objected, "because the sea-catch can't leave his harem."

"Can't! Old bulls are all the way along," the agent answered. "Every one will attack a holluschickie who has once been attacked. No chance to escape. But the bachelors know that. They pass up and down such a causeway by thousands, night and day. They 'don't turn to de right, don't turn to de lef', but keep in de middle ob de road,'" quoted the agent, laughing.

"And you say that all the furs, then, are taken from among the holluschickie?" queried the boy.

"Every one of them."

"But how do you hunt the bachelor seals?"

The agent stared at him in surprise, and then burst into a short peal of laughter.

"Hunt? How do you hunt pet puppies?" he queried, in reply. "The holluschickie are the tamest, gentlest creatures in the world. Here are the hauling-grounds now. Let's go down. You'll see how tame they are."

"But it's like a dancing-floor or a parade-ground for soldiers!" cried Colin as, reaching the top of the hill, he looked across a stretch of upland plain at least half a mile across. There was not a blade of grass, not a twig of shrubbery of any kind, all had been beaten down and the bare ground was as smooth as though it had been leveled off and rolled. Upon this bare plain, thousands of the holluschickie were playing, the most characteristic game seeming to be a voluntary march or dance, when the bachelors would roughly gather into lines or groups and lope along at exactly the same speed together for about fifty feet, stopping simultaneously for a few moments, and then going on again, as though obeying the commands of a drill-sergeant.

"They don't seem to play with each other much," commented Colin as the two walked among the holluschickie, who showed neither fear nor excitement, merely shuffling aside a foot or two to let them pass.

"They do in the water," the agent said. "Play 'King of the Castle' on a flat-topped rock for hours together. One seal pushes the other off the coveted post, only to be dislodged himself a minute after. And I have never once seen any sign of ill-humor. They never bite. They never injure one another. They never even growl angrily. It's hard to believe that their tempers can change so quickly when they reach the rookery."

"They seem to be of all ages and sizes," said Colin.

Bull Fur-Seal Charging the Camera.

Courtesy of the National Geographic Magazine.

Snapshotting an old Beach-Master.
This plate was recovered, although the photographer was drowned on the treacherous shores of the Pribilof Islands the very day the picture was taken.
Courtesy of the U. S. Bureau of Fisheries.

"Yearlings of both sexes and males from two years old to five," the agent answered.

"Do they fast all summer, too, like the sea-catches?"

"No," was the reply. "No need for it. They go to sea every few days. If the sun is out they stay in the sea. They make long journeys, too, just as the mother seals have to do, because a seal needs at least thirty pounds of fish a day to keep in good condition. All the nearby fishing-grounds have been exhausted."

"I suppose the different colors show the different ages?" the boy suggested.

"Exactly," the agent answered. "That's important, too. By law we are only allowed to sell skins weighing between five and eight and a half pounds. That means only those of males two and three years old. The skin of a yearling weighs just about four pounds and that of a four-year-old male eleven or twelve."

"How about the two-year-old cow seals? You said that only the yearlings among the females were here."

"The cow seals never come twice to the hauling grounds," was the reply. "They go for the first time to the rookeries in their second year."

"I should think it would be easy enough then to 'cut out' a herd," the boy said. "I could pretty nearly do it myself."

"Obviously! Without any trouble!" was the reply. "But you've got to go slow."

"Why?" the boy queried.

"If a seal is hurried he gets heated. You remember I told you how little they can stand. If a seal is killed after being heated, fur comes off in patches and the skin is of no value. Let's go on. I have to tally those that are knocked down."

"I thought you were going to drive some!" said Colin in a disappointed tone, as they turned away from the hauling-grounds along a well-beaten road.

"The drive started three hours ago and more," was the reply. "Quarter of a mile an hour is fast enough to make seals travel. You can drive as fast as a mile an hour, but lots will be left on the road to die from the exertion. Yet the same seals will swim hundreds of miles in a day."

"But what can you do, then, on a warm day? Do you drive during the night?"

"No seals here on a warm day," was the immediate answer. "You saw all those thousands of holluschickie on the hauling-grounds? If the sun were to come out now, in half an hour there wouldn't be a seal on the entire flat. All disappear into the sea. Absolutely!"

"What is that group over there?" asked Colin, pointing to a small cluster a short distance ahead of them, near some rough frame buildings.

"That's the drive," the agent answered. "The killing-grounds are always near the salt-houses. What's that? The smell? Worst smell in the world, I thought, when I first came here. You can't kill seals in the same place year after year and just leave the flesh to rot without having a frightful

odor. One gets used to it after a while."

"It seems to me that you're running the risk of starting up a plague or something!"

"No," was the reply, "it has never caused any sickness here. Then the drive is small now to what it used to be. Time was when three or four thousand seals would be driven, where we only take a couple of hundred now. Fallen off terribly! Fifty years ago, every available inch of all the beach was rookery, settled as thick as in the rookery you saw just now. The holluschickie were here in uncounted millions. These hills, now overgrown with grass, show the soil matted with fine hair and fur where the seals shed their coats for hundreds of years. Now a few scattered rookeries are all that remain."

"Do you suppose the seal herd will ever be as big again?" the boy asked.

The agent shook his head.

"I'm afraid not. The governments interested won't keep up the international agreement long enough," he said regretfully. "It would take thirty or forty years. Yet it would be worth it. You see," he continued, "this is absolutely the only place in the world where the true Alaskan fur seal —the sea bear, as it used to be called, because it isn't a seal at all—can be found. The fur seals on the Russian islands are a different species. Those on the Japanese islands are different from both."

"You say a fur seal isn't a seal at all?" asked Colin. "What's the difference?"

"Not the same at all. Different, entirely. Don't even belong to the same group of animal. They look differently. Their habits are unlike. Oh, they're dissimilar in every way."

"Just how?" asked Colin curiously.

"In the first place, the sexes of the hair or common seal are the same size, not like the fur seal, where the sea-catch is four or five times bigger than the female. Then they don't breed in harems and the male hair seal does not stay on shore. A fur seal swims with his fore flippers, a true seal with his hind flippers. A fur seal stands upright on his fore flippers, a hair seal lies supine. A fur seal has a neck, a hair seal has practically none. A fur seal naturally has fur, the hair seal has no undercoat whatever. A pup fur seal is black, a pup hair seal is white. Different? Obviously! Pity the old name 'sea bear' died out. It would have prevented confusion between fur seal and true seal."

With this beginning, the agent passed into a detailed description of the anatomy of the two different kinds of seal, and wound up with an earnest panegyric of his fur seal family. By the time the agent had completed his earnest defense of the sea bear, lest it should be confused with the more common seal, the two had reached the killing-grounds, where the natives were awaiting the agent's word to begin their work. He stepped up to the foreman of the gang and with him looked over the first 'pod' of about fifty that had been selected for killing, noting one or two that looked either too young or too old or with fur in bad condition, and these points settled, he gave the word to begin.

The 'pod' of seals was surrounded by eight men, each armed with a club about five and a half feet long, the thickness of a baseball bat at one end and three inches in diameter at the other. Behind him, each of the natives had laid his stabbing-knife, skinning-knife, and whetstone. At the word the killing began. Each native brought down his club simultaneously, the first blow invariably crushing the slight, thin bones of the fur seal's skull and stretching it out unconscious. The six or seven seals that fell to each man's share were clubbed in less than a minute for the lot.

The Aleuts then dropped their clubs and dragged out the stunned seals so that no one of them touched another, and taking their stabbing-knives, drove them into the hearts of the seals between the fore flippers. In no case did Colin see any evidence that the seal had felt a moment's suffering.

"Now," said the agent, "watch this, if you like seeing skilful work. Skinning has got to be done rapidly. Precisely! Else the seal will 'heat' and spoil the fur."

Watching the native nearest to him, Colin noticed that he rolled the seal over, balancing it squarely on its back. Then he made half a dozen sweeping strokes—all so expert and accurate that not a slip was made with the knife, nor was any blubber left on the skin. In less than two minutes, by the watch, he had skinned the seal, leaving on the carcass nothing but a small patch of the upper lip where the stiff mustache grows, the insignificant tail, and the coarse hide of the flippers.

The whole sight was a good deal like butchery, and Colin felt a little uncomfortable. Moreover, he was not hardened to the odor arising from the blubber of the seal. He beat a retreat.

"I beg your pardon, Mr. Nagge," he called, holding his handkerchief to his nose, "but that's too much for me."

The agent turned and noticed his departure. He called back to the boy:

"Do you see that low hill? To the right of that ruined hut?"

"Yes," Colin responded.

"Just below that are some sea-lions! Go and take a look at them. I'll join you as soon as we are through here. Won't be long. But you'll have to stalk them to the leeward if you want to get close," he added, "they're shy. I'll meet you there and we'll go back to dinner. You ought to be hungry by then."

"I will be, then," Colin responded cheerfully, adding under his breath, as he glanced back over his shoulder at the killing-grounds, "but I'm not now!"

A short walk through the long moss a-glitter with wild flowers, poppies, harebells, monkshood, and a host of sub-Arctic species, brought the lad to the top of the hill. There he paused a moment, to look over the island, treeless save for dwarf willows six inches high and a ground-dwelling form of crowberry. Below him, and some distance away, were the sea-lions, but even from that coign of vantage they looked so big and menacing that Colin wondered whether they might not stalk him, instead of his stalking them.

After a little scrambling, however, he found himself at the bottom of the cliff, and made his way as carefully as he could to the sea-lion rookery. But when he did come near and rounded a large boulder in order to get a fair view, he was inclined to think that shyness was the last idea he would have gained from the looks of sea-lions. Near him, almost erect on his fore flippers, was an old bull, a tremendous creature, well over six feet in height and weighing not less than fifteen hundred pounds.

Apart from size, he was a much more vicious-looking creature than the sea-catch; the tawny chest and grizzled mane gave him a true lion-like look, and an upturned muzzle showed the sharp teeth glistening white against the almost black tongue, while a small wicked, bulldog eye glittered at the intruder. The female sea-lion, near by, was almost as large as a six-year-old bull seal.

Wanting to see something happen, and realizing from the build of the sea-lion that he could not make much progress on land, Colin threw a stone at a pup sea-lion who was asleep on a rock close by.

But the boy was utterly unprepared for the result, for no sooner did the huge sea-lion realize his advance as he strode forward to throw the stone, than it was smitten with panic. When, moreover, it heard the 'crack' of the pebble as it hit a rock behind him, the cowardly creature went wild with fear, and made convulsive and clumsy efforts to reach the water ten feet away, tumbling down twice in doing so, and finally plunging into the ocean trembling as though with ague. At the alarm, the entire rookery took flight, leaving the pups behind, sprawling on the rocks. The parents ranged up in a line about fifty feet from shore and remained at that safe distance as long as Colin was in sight. He watched the pups for a little while, but they were not nearly as interesting as seals, and he was quite ready to go when his friend hailed him from the top of the hill.

"Sea-lions look sort of human in the water, don't they?" remarked Colin as he rejoined his friend, and turned for a farewell glance at the creatures with their upright heads and shoulders and inquisitive look.

"The Aleuts say they are," his friend replied. "They declare their ancestors were sea-lions or seals. That's a general belief on the north coast of Scotland and in the Hebrides, too."

"That men came from seals?"

"Certainly. What do you suppose started all the mermaid stories? Round head, soft tender eyes, and a fish's tail? Seals! Obviously! And, if you notice old pictures of mermaids the tail is drawn as if it were split in two, just like the two long flippers of the seal."

"I never thought of that before," said the boy.

"You've heard of the Orforde merman, of course, haven't you?"

Colin admitted his ignorance.

"Queer yarn. Quite true, though," the agent said. "Documents show it. It happened off the coast of Suffolk, England. About the end of the twelfth century, I think. Some fishermen caught a creature which they described as being like an old man with long gray hair, but which had a fish's tail. It could live out of the water just as well as in it. They brought it to the Earl of Orforde. In spite of all their efforts they could not teach the merman to speak. Naturally! So the priest of the parish suggested that perhaps the creature had something to do with the devil. Characteristic of the time! So they took the 'merman' to church. But it showed no sign of adoration and didn't seem to understand the ceremonies. So they were convinced that it was an evil thing, and put it to the torture, hoping to extract a confession from—a seal!"

"But there are mermaids!" said Colin. "I've seen 'em. Not alive, of course, but stuffed."

"So have I," the agent said, laughing; "that was a trick the Japanese used and fooled a lot of people. Why, there was one in a museum in Boston for years! It was a fake, of course. Obviously!"

"How did they do it?"

"Head and shoulders of a newly-born monkey fastened to a fish's body. I forget now what fish. Then with incredible pains, they laid rows upon rows of fish scales all over the monkey's

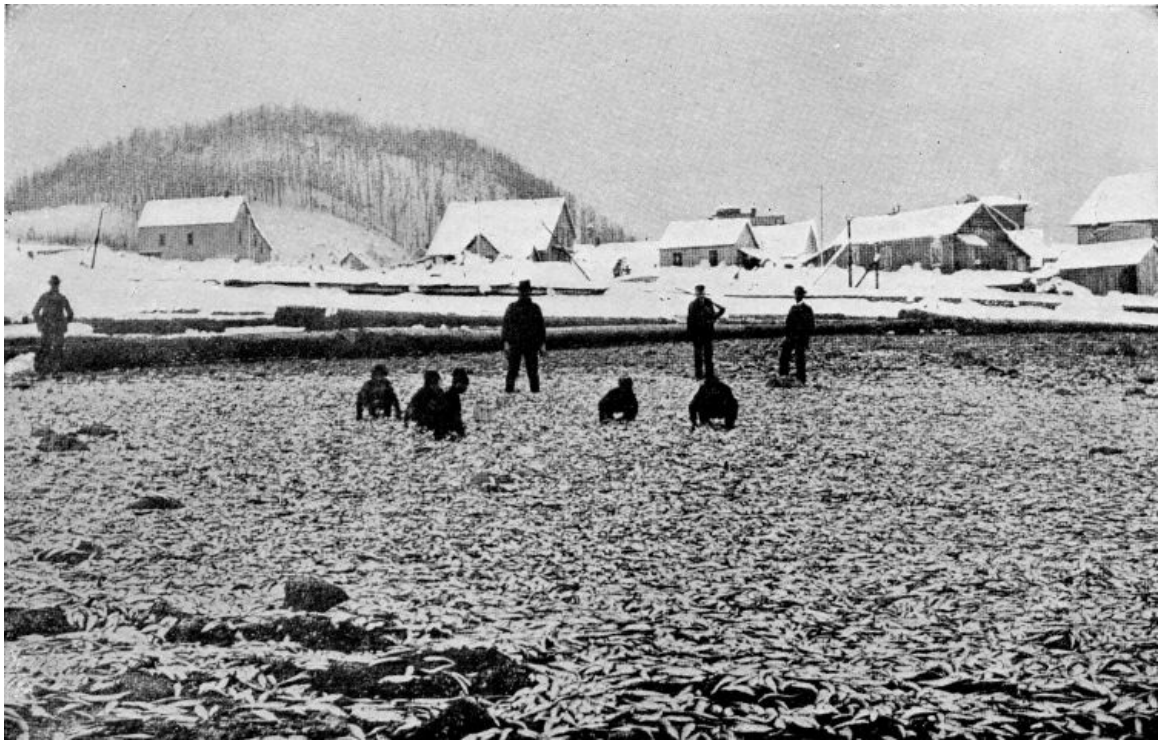
shoulders and chest. Wonderful work. Each scale was glued on separately, beginning from scales almost microscopic and shading both in size and color exactly into those of the fish hinder portion. The work was so exquisitely done that its artificiality could not be detected. But live mermaids haven't been put in any aquarium. Not yet!"

"I don't suppose there's even a water-baby left!" the boy said, laughing.

"No," was the reply. "We couldn't give it any milk now, the sea-cows have been all killed off."

"Sea-cows?"

"Big creatures, bigger even than walruses. Lots of them here some time. We find their bones everywhere. Nearly all our sled-runners are made of sea-cow bones. They grazed like cattle below water on the seaweeds of the shore and the natives used to spear them at low tide."



Catch of Herring on Beach at Gastineau Channel, Alaska.

Courtesy of the U. S. Bureau of Fisheries.

"Are there walruses here, too?"

"I saw three a few years ago, but none since. About two hundred miles north of here, however, on St. Matthew's Island, there used to be scores of them. But I reckon hunters and polar bears, between them, have destroyed most of them."

"Do polar bears come here in winter?"

The agent shook his head.

"The Pribilof Islands are not cold enough for a polar bear. Besides he likes walrus meat better than seal. Bear eats a lot of fish, too."

"I thought they lived almost entirely on seals."

"They couldn't very well," was the reply. "Seal is a better swimmer than a bear, although the polar bear is a marvel in the water for a land animal and can overhaul a walrus. The big white fellows only catch seal when basking on the ice. They get a good many that way. The hunters have left nothing to the Pribilofs except the fur seal and the sea-lion, and not many of those. And unless we can find a way to stop the seal-pirates, those will soon be gone, too."

"Do you have much trouble with that sort of thing?" the boy asked.

"A lot nearly every year. We won't have so much of it now. Great Britain, Japan, Russia, and the United States are united in the desire to prevent pelagic sealing. Good thing, too. A treaty has been signed, forbidding it for fifteen years. So you see, a seal poacher on the rookeries finds everybody against him."

"Wasn't there a lot of trouble some years ago?" Colin asked. "I heard that there was real fighting here."

"Indeed there was, and lots of it! No one, not even the United States Government, ever knew how much. While the islands were leased to a private company the beaches were patrolled by riflemen. Russian and Japanese schooners frequently sent off boatloads of armed men during a fog, to kill as many seals as possible, protecting their men by gunfire. But that was before the Bureau of Fisheries took hold!"

"Has there been any of that lately?"

"Not recently. The last was in 1906, when seven men were killed. The two schooners, the *Tokaw Maru* and the *Bosco Maru*, were seized and confiscated. Promptly! The men were taken to Valdez. They were convicted and sent to prison."

"Well, that's desperate enough," the boy said, "but, after all, there's something daring about it. It's the pelagic sealing that seems so mean to me."

"It may be daring enough," the agent admitted. "The way I feel about it, though, is that it seems worse to kill a cow fur seal than a human being. There are lots of people in the world. The human race isn't going to die out, but the small remnant of fur seals on the Pribilof Islands is absolutely the last chance left of saving the entire species from extinction. So," he concluded with a laugh, as they went into the village, "don't let your enthusiasm for a piece of daring tempt you to turn seal-pirate."

Colin laughed, as he nodded to his host, and went to see after one of his new pets, a blue fox pup which had been given him that morning by one of the natives.

Evening seemed to come early because of the dense fog, the damp mist which had been present all day settling down heavily. Colin was thoroughly tired, but not at all sleepy, and he wandered aimlessly through the village for a while after supper.

"I wonder if there's a storm coming?" he said to the agent. "I have a sort of feeling that something's going to happen."

"It may blow a little fresh," was the reply. "That's all. The barometer doesn't seem disturbed."

"I must be wrong then," said Colin, suppressing a yawn, "but I have a queer sort of excited feeling."

"Better take it out in sleep," was the advice given him. "We're all going to turn in soon. Even if you did get a nap this afternoon, you ought to be tired after last night."

The boy could see nothing to be gained by arguing the point, and there was nothing special to do, so he waited a few minutes and then went up to his room, though he had never felt less like sleeping. He got into bed, however, but tossed about uneasily for hours, the distant roaring of the seals on the rookery and other unaccustomed noises keeping him awake. And ever, through it all, Colin was conscious of this presentiment of some trouble on hand. Suddenly, this feeling rushed over him like a flood and, impelled by some force he could not resist, he sprang from bed and hurried to the window.

The fog had thinned considerably, but it was still so misty that he could only just see the edge of the bleak shore where the little waves rolled in idly, looking gray and greasy under the fog. He leaned his arms on the sill, but aside from the seal-roar, everything seemed peaceful and the lad was just about to turn away from the window in the feeling of miserable anger that comes from being tired but not able to sleep, when he saw a flash of light.

Startled, and with every nerve stimulated to alertness, he watched, and again he saw the light. Straining his eyes Colin could just distinguish the figure of a man with a gun on his shoulder and a lantern in his hand, making his way to the coast end of the village.

"Some one who has been making a night of it!" the boy muttered to himself with a short laugh, and got back into bed.

But the figure of the man with the gun and the lantern in his hand had impressed itself on his mind, and though he tried to dismiss the idea and go to sleep, every time he closed his eyes he seemed to see the man go walking silently through the village. Presently he sat bolt upright in bed.

"The native huts are all at the other end of the village!" he said half aloud, with a surprised suspiciousness. "Why was he going that way?"

The boy rose and went back to the open window. It seemed to him that there was more tumult from the rookery than when he had listened half an hour before, but it occurred to him that this was probably the result of the silence of the hour and his own restlessness. Then, not loudly, but distinctly, in spite of its being muffled by the fog, the sound of a rifle-shot came to his ears.

That settled it for Colin. If there was anything going on in the way of sport he wanted a share in it, and as he was wide awake, he decided to follow up and see what was going on. He slipped into his clothes as quickly as possible and tiptoed his way down the rickety stairs. But before he had gone many steps an unaccustomed thought of prudence struck him, and he walked back to a house three or four doors from where he had been staying, the home, indeed, of the villager who had given him the pet fox, and in which Hank had taken up quarters. He knocked on the window and immediately Hank appeared.

"What is it?" he queried. "Oh, it's you, Colin. Why aren't you in bed?"

"I was," the boy answered, and in a few words he told how he had seen the native go by with a gun and a lantern and had heard the shot fired a few minutes ago.

"Sounds like smugglin'," the old whaler said, after a minute's thought. "Well, there's no great

harm in that. That is, I don't think so, though the gov'nment chaps might say different."

"Smuggling?" queried Colin; "poaching. Do you mean seal-poaching? Oh, come along, Hank, and let's find out."

"What's the use of huntin' trouble?" said the old man. "Go back to bed."

"Not much," retorted the boy; "if you don't want to come, I'll go, anyway."

"If you're goin' anyway," grumbled the old whaler, "I reckon it's no use my sayin' anythin' to stop you. But I s'pose," he added, and he was secretly as curious as the boy, "I'd better go along with you to see that you don't get into any more mischief than you have to."

"You're coming, then?" asked Colin impatiently.

"I'll be right out," the other answered, and he had hardly disappeared from the window when he appeared at the door. He slipped a revolver into his pocket and handed another to Colin.

"I've got a gun," the boy said.

"All right," responded Hank, "I'll pack this one along, too," and he slipped it into one of the pockets of his big reefer.

They walked in silence for a few minutes until they had passed the end of the village, and then Hank put his hand on the boy's arm.

"You've got a right hunch," he said abruptly, in a low voice. "There's somethin' in the wind."

"What makes you think so?" asked Colin.

The other pointed vaguely to sea.

"There's a ship out there," he said.

Colin did his utmost to pierce the gloom, but the fog had settled down again, the night was dark, and the boy could scarcely see the waves breaking on the shore not twenty feet away.

"I can't see anything," he said. "Whereabouts?"

"I don't know just where," the old sailor replied, "but I know she's there. I feel it."

"Let's hurry!" said the boy.

"Better go slower," warned Hank, pulling him back gently; "we're not far from the rookery."

"I don't see why we should be so careful, and I don't see why we should whisper," Colin objected, whispering nevertheless; "the seals are making noise enough to drown a brass band."

"Listen!" said Hank.

The boy put his hand to his ear, trying to distinguish sounds in the continuous roar.

"Voices?" he queried with a puzzled look.

"I thought so," the whaler nodded. There was a pause, while both listened, then the gunner said:

"It isn't English and it doesn't sound like Aleut or Russian."

"Japanese?" queried the boy at a guess.

The man grasped the boy's shoulder with a grip that nearly dislocated it.

"Japanese raiders!" he said. "Can you run?"

"You bet," said Colin, growing excited; "I'm a crack runner."

"Get back to the agent's house as fast as you know how an' wake him up. He'll know what to do."

"What are you after, Hank?" asked the boy, tightening his belt.

"Whatever comes along," was the terse reply.

Colin pitched off his heavy coat and started. It was over a half-mile run, but the boy was in good condition and the path was smooth, so that two minutes saw him at the agent's bedroom door.

"Eh? What's that? Japanese raiders! You've been dreaming, boy. Go back to bed."

"Do I look as if I'd been dreaming?" Colin said indignantly. "How do you suppose I could run myself out of breath in a dream? Hank was with me. He heard them, too, and sent me back to tell you."

But the agent was already up and busy.

"Wake the village!" he said shortly.

Without waiting to find out how this should be done, Colin started off at a run, and picking up a killing club that lay handy, he sped down the village street, hitting a resounding 'whack' on every door as he passed. As he came back, up the other side of the street, the natives were streaming

out of their houses and Colin told them all to go to the agent, whereupon those who understood English started immediately, the rest following. The agent was ready and had all his plans made, some of the men were sent to the boats, and arms for others were laid out.

"They were right on Gorbatch rookery?" the agent asked.

"Yes, sir," Colin replied, "at the Reef Point end."

The party was swinging along at a fast half-run over the sands that lay between the edge of the village and the beginning of the rookery, and with the rising of the moon the fog seemed to thin.

"I had rather we were a little nearer before it gets too light," the agent said, "but we'd better make the best use we can of our time."

On reaching the wall, the agent vaulted lightly over it, the rest following suit, and to Colin's surprise the official led the way behind the rookery, threading in and out between idle bulls, who made a display of great ferocity but never actually attacked. The agent paid not the slightest heed to any of them, merely keeping out of reach of their teeth.

As they turned a corner, a cloud which had partly obscured the moon passed and showed them an unexpected sight. Magnified into gigantic forms by the fog were the figures of six men, apparently all armed, facing Hank, the old whaler, who, with both revolvers, was keeping them at bay. He was close to the shore, standing behind two old, wicked-looking beachmasters, who, in the unnatural light, appeared to be twice their natural size. Hank let out a hail as soon as he saw the government party coming to his assistance, but he did not relax his vigilance.

"I've got this bunch covered," he said, "an' they can't get to their boat. One load did get off."

Hearing his shout the invaders turned quickly, but found themselves overpowered, for a dozen rifles were leveled at them. They knew, too, that natives who are trained to shoot fur seal in the water—as most of those men had done before pelagic sealing was stopped—could be counted on as good shots.

The agent, who spoke sufficient Japanese for simple needs, demanded the surrender of the raiders and asked which was the officer of the party. This question they refused to understand.

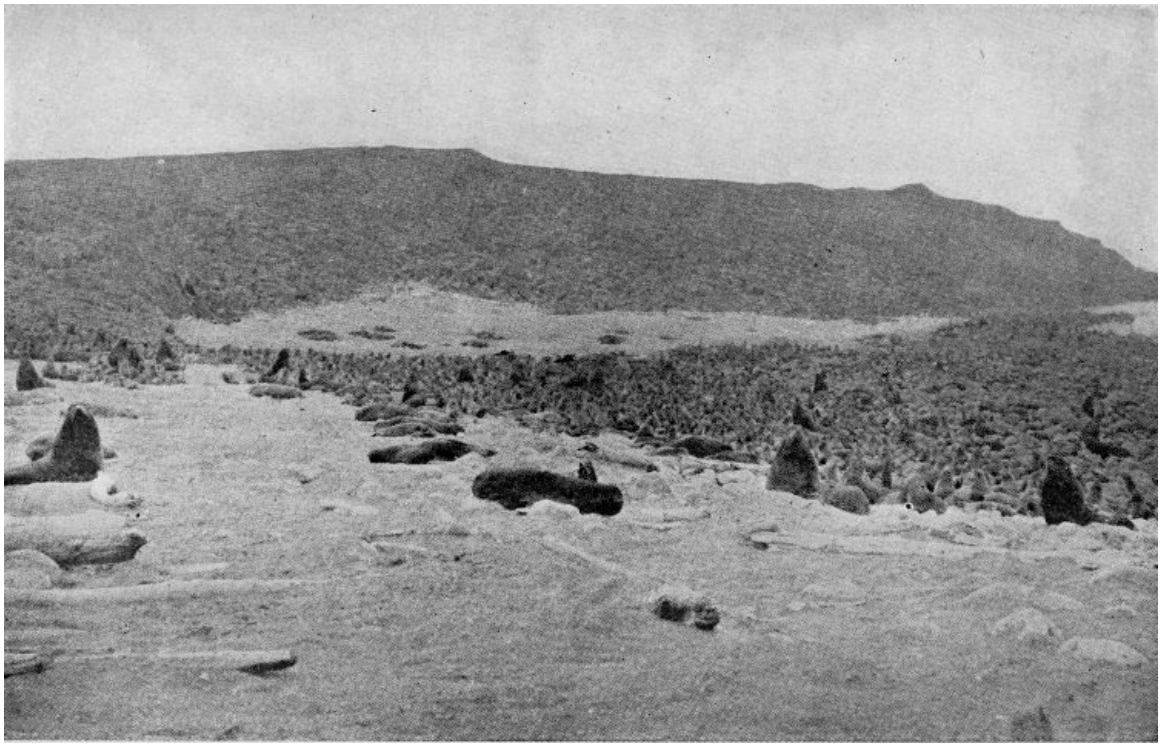
"I suppose he went off in the other boat," hazarded the agent. "That's a pity. He stands a good chance of being shot!"

Colin looked up inquiringly.

"How do you expect to catch him now?" he asked.

"The fog is clearing away. Obviously!" the agent answered.

"Quite a lot," the boy admitted.



A Typical Seal Rookery, half abandoned.
Showing the massing of the harems, the watchful figures of the beach-masters, and the idle bulls in the background.
Courtesy of the U. S. Bureau of Fisheries.

"Row-boat hasn't much chance against a launch, has it?"

"Oh, I see now," Colin said understandingly; "you covered the water with another party."

"In a very swift gasoline launch we have. While you were waking the village, I got a wireless to a revenue cutter. I caught her at less than fifteen miles away, and she's headed here now."

He turned to the Japanese.

"What is your ship? Schooner or steamer?" he asked.

"Schooner," was the reply.

The agent rubbed his hands delightedly.

"It's a clean haul," he said. "Thanks to you, Hank. Principally. To the boy, too! We've caught six men red-handed right on the rookery, with dead seals, most of them females. The launch ought to intercept the boat. There's not wind enough for a schooner to get far away by the time the revenue cutter arrives. Besides, the schooner will be short-handed since we have six of the crew here."

A sudden puff of wind lifted the fog still further and revealed the schooner herself, lying not far from shore. A row-boat was about one hundred and fifty feet from the vessel and the station launch was two hundred feet away, approaching from a different angle, but outspeeding the row-boat.

"A race!" cried Colin.

It was a closer race than at first appeared. Under the strange light of the full moon shining grayly through the silvering mist upon the seals in their countless thousands, the scene seemed most unreal. Before him appeared the principals in this dramatic encounter, revolvers and rifles in the hands of all parties, the Japs being still covered; while beyond, at sea, the two boats cleaving the water, their objective point the shadowy schooner, looking like a phantom ship, made a picture of weird excitement in an unearthly setting. The seconds seemed like hours. The row-boat was nearer the schooner and was traveling fast, but the launch was speeding even more rapidly, throwing up a high wave at the bow. It looked as though both boats would reach the schooner's side at the same instant.

"She'll do it! She'll do it!" the boy exclaimed. "If only an oar would smash!"

The Japanese, though not saying a word, were bending forward eagerly, watching the race with every nerve on the strain.

Colin fairly danced with excitement, nearly bringing down on himself the wrath of a neighboring sea-catch, who was roaring angrily at this intrusion.

"If she only had another couple of horsepower——" he cried.

The Japanese smiled.

A port in the rail of the schooner opened and the muzzle of a small swivel-gun projected, aimed full at the launch. Colin caught his breath.

A puff of smoke followed, and a couple of seconds later the sharp crack of a small gun. A crash and a few sharp explosions were heard from the launch, but, so far as could be seen from the shore, no one was injured. The engine gave a 'chug-chug' or two—then stopped dead.

Colin dropped his arms limply by his side in despair.

The leader of the Japanese took a quick step forward and whispered a word or two to the nearest man, who passed it down the line. The agent strained his ears to hear what was said, but could not distinguish the words.

"What's that you were saying?" he asked in Japanese.

The man replied calmly, and in English.

"We say nothing," he answered blandly, "only that you have made big mistakes. That is not our ship!"

The agent stared at him, but the Japanese smiled affably.

"We are shipwreck on the island," he said. "We not know what place it is, have no food, hungry, kill some seal for food, anybody do that."

At this impudent and barefaced falsehood, the agent was tongue-tied, but he turned to Hank.

"These men say," he said, "that they are shipwrecked sailors and do not belong to that ship. Let's get this thing right. Tell us what you know about it."

Hank straightened up.

"After the boy left me," he said, "I saw it wouldn't do any good to tackle 'em at once, there bein' no way of gettin' at 'em from the shore side. If I let 'em know they were watched, they would be off, sure, an' what I wanted was to find some way to head 'em off. I knew if you came down the beach after 'em they'd have the start, an' you can't always depend on shootin' straight at night in a fog."

"What did you do, then?" asked the agent.

"I just slipped into the water, down by the end o' the causeway," the old whaler said, "an' there were scores o' seals around, so that it didn't matter how much I splashed."

"You must be half a seal yourself," the agent said. "Swimming among rocks in the dark is no joke."

"I had plenty of time, and I can swim a little," the old man modestly admitted. "Wa'al, pretty soon I saw the boat an' I swam under water till I came up right behind it. The Jap what was sittin' in it wasn't expectin' any trouble an' as he was nid-noddin' and half asleep, I put one hand on the stern o' the boat, bringin' it down in the water. With the other hand I grabbed the back of a blouse-thing he was wearin' an' yanked him overboard."

"You didn't drown him, did you, Hank?" asked Colin.

"Not altogether," the old whaler answered. "I held him under, though, until he was good an' full o' water an' had stopped kickin', an' then I climbed into the boat. Next time he came up I grabbed him an' took him aboard. The fog was pretty thick an' none o' the rest of 'em saw what was goin' on. In a minute or two I could see he was beginnin' to come round an' I didn't quite know what to do. I didn't want to knock him on the head, he hadn't done anythin' to hurt me, an' so I dropped the row-locks overboard, tossed the oars ashore—there they are, lyin' among the seals—an' got ashore myself. As soon as I was on solid ground I untied the painter what held the boat an' set it adrift, givin' it a push off with one o' the oars. The tide's goin' out, so I knew he couldn't get ashore again. I'd hardly got the boat shoved off when he yelled an' the rest of 'em heard it."

"What did they do?"

"Come rushin' for the boats. Most of 'em went over to the south'ard," he pointed down the rookery, "where there was a boat I hadn't seen, but these six tried to rush me. I just had time to shove the boat off, grab my guns, an' face 'em."

"It was a bully hold-up," said Colin delightedly, "one against six."

"Had to," said the sailor, "or the six would have made mincemeat o' the one. Besides, I had to give the tide a chance to get that boat out o' the way. After I held 'em a few minutes I knew it was all right, because they had no boat, their own bein' adrift without oars."

"Big lie," said the Japanese leader placidly, "we shipwreck sailors, nothing to do with that ship at all. This man tell story about boat—we not know anything of that boat. Our boat sunk on rocks, away over there!"

He pointed to the other side of the island.

"But you were killing seals!" protested the agent.

"Yes," said the Japanese, "we think islands have not any person on. Need food, we kill. Of course."

"Clever," said the agent, turning to Hank. "This isn't as simple as it looks. We have no direct evidence that these men belonged to that schooner."

"But we know they did!" said the whaler emphatically.

"Of course," agreed the agent. "But we can't prove it. Law demands proof. If we only had that boat, with the schooner's name on, it would serve."

Suddenly there came a hail from the crippled launch which was being brought in under oars.

"Mr. Nagge there?"

"Yes, Svenson," was the reply, "what is it?"

"They smashed our engine all to bits," answered the engineer of the boat, "but we've just picked up another boat, empty."

"That's the boat," said the agent with satisfaction in his voice. "Now we've got them!"

A smile, a very faint smile, crossed the features of the Japanese leader.

"What's the name on the stern of the boat?" the agent called.

There was a moment's pause, then came the answer in tones of deep disgust:

"The name's been painted out!"

The agent looked round despairingly and caught Colin's look of sympathy.

"The slippery Oriental again!" the boy said.

"Not quite slippery enough this time, though," said Hank in a voice which betrayed a discovery.

"What do you mean?" asked the agent.

"Uncle Sam's gettin' into the game," he answered, pointing out to sea.

"The revenue cutter?"

"Hm, hm," grunted the whaler in assent, "I reckon I can see her lights."

No one else could see anything in the fog and darkness, but a minute or two later there came a flash, followed by a dull "boom."

Hank turned to the Japanese leader.

"Pity to spoil that yarn o' yours," he said, "but your ship can't run away from quick-firin' guns without a wind."

CHAPTER IV

CATCHING THE SEA-SERPENT

There was great excitement in the village the next day when the revenue cutter brought in the Japanese raiding schooner and her crew. The boat that had successfully reached the ship had already begun to load her quota of sealskins, and the men had not thrown them overboard, believing that they could get away. Consequently, with the evidence of the raid ashore and with the seals in the boat belonging to the schooner from which witnesses had seen the crew go on board, the case was complete.

"What are you going to do with the prisoners?" asked Colin. "Are you going to put them on trial here?"

"Not here," the agent replied. "The Federal Courts look after that."

"But I thought you were a judge," the boy protested. "Who administers justice on the islands?"

"The chief agent," was the reply. "He is a magistrate. All the natives are employees of the Fisheries Bureau. He has a lot of authority over them. Obviously! But any really grave case is tried at Valdez, because that's the nearest Federal court from here. Sealing questions, too, are so confused with international issues that we don't undertake to decide them."

"And what will happen to the schooner?"

"A prize crew will be put aboard. Take her to Unalaska. The revenue cutter will pick them up afterwards. Probably start for Valdez without delay. Captain Murchison said this morning that he wanted to go along."

"I wonder if I'll have to go?" said Colin. "I'm sure I don't want to, at least, not yet. There's ever so much more that I want to find out about seals, and I've hardly started. If I'm ever lucky enough to get into the Bureau of Fisheries, I hope I shall have a chance to get something to do on this fur seal service."

"Fur seal's very important. But only a small part of the Bureau of Fisheries," the agent said, and outlined to Colin the general workings of the Bureau, in which he showed the practical value of the work.

"I know. I want to join the Bureau," the boy persisted, "not only because I think there's more fun in it than in anything else, but because I like everything about it."

"What do your folks say about the plan?" the Fisheries agent queried.

"They know I want it," the lad replied, "but I never felt that I knew enough about the Bureau to say that I didn't care to do anything else. Father's always wanted me to take up lumbering or forestry or sawmills or something to do with timber. He's quite a big lumberman, you know. But, some way, that never appealed to me."

"Your father ought to know," the other said. "Obviously! And if he owns timber lands, I think it's up to you to be a help. Lots of interesting angles to the lumber business. And if the timber lands are going to descend to you, you'll have to look after them, anyway."

"But they won't," objected Colin; "that's just it. In about ten years that timber will be all cut off. I'm pretty sure Father will let me join the Bureau," the boy continued, "because he's wild about fishing himself. Why, just now, he's down at Santa Catalina, angling for big game."

"Some difference between the Fisheries Bureau and angling for sport," the agent warned him. "I've been in the business all my life. But I've never even learned to cast a fly! It's a serious business, and down in Washington you'll find that the value of the work to the people of the United States is the chief aim of the Bureau."

"It may be serious, but I should think that there is always something new. And, anyway," Colin said enthusiastically, "fishes are ever so much more interesting than animals. There are such heaps of different kinds, too!"

"The interest in work depends on how you look at it," soberly responded the agent. "Obviously! But don't think the Bureau is experimenting with every kind of fish in the ocean. There are only a few food fishes or forms with commercial value that are exploited at all."

"But you were describing to me, only yesterday, the way they handle millions of baby fishes annually. I've just got to get into the Bureau."

"Go ahead, then. I don't doubt we'll be glad to have you. I've done my best to show you what you'll have to face," the official declared, "and if you're still eager for it, why, go in and win. There's always a place somewhere for the chap who is really anxious to work."

At supper that day, the decision was announced that the revenue cutter would start for Valdez next morning, and Colin had to scramble around in a hurry to take a last look at the seals, to get a small crate made for the blue fox pup, which he was going to send home for his younger brother to look after, and to put into a small trunk he had got from one of the villagers the few things he had saved from the wreck and had been able to buy in the village.

The trip down to the Aleutian Islands and through its straits was a delight to Colin, and he became quite excited when he learned that the second lieutenant had for years been attached to a revenue cutter which had a wharf at the Fisheries Bureau station at Woods Hole, Mass. This officer, who had a brother in the Bureau, was only too glad to talk to the boy about the service, and Colin monopolized his spare time on the journey. And when, one day, his friend depicted the immensity of the great salmon drives of the Alaskan rivers, the lad grew so excited that the lieutenant laughingly told him he expected some fine morning to find that he had jumped overboard and had started swimming for the Ugashik River or some other of the famous salmon streams of Alaska.

Native Salmon Trap on an Alaskan River.
Courtesy of the U. S. Bureau of Fisheries.

Modern Salmon Trap on an Alaskan River.
Courtesy of the U. S. Bureau of Fisheries.

Shortly before they arrived at Valdez, the lieutenant of the cutter called the boy aside.

"Colin," he said, "didn't you tell me the other day that you were going down to Santa Catalina?"

"Yes, sir," the boy answered. "Father's down there now, and I want to ask him if he won't let me go and join the Bureau of Fisheries."

"Well," the officer replied, "before you do that, I think you ought to get some idea about the sort of work there is to do. It happens that one of my brother's friends is on the Columbia River just now, making some kind of experiment on salmon. He has a cottage not far from one of the state hatcheries, and if you like, I'll give you a letter to him. If you are really determined to enter the Bureau, you might stop on your way to Santa Catalina and see the work from another point of view."

"I'd like to ever so much," said Colin, "but I couldn't very well go uninvited."

"He'll be only too pleased to see you," was the reply; "he's a Westerner like myself, and will enjoy putting you up for a day or two."

"It's right in my way, too," remarked Colin, yielding to his desire to go.

"Quite a few of the steamers for 'Frisco stop at Astoria, at the mouth of the Columbia River," the lieutenant suggested, "and the professor's cottage is not more than half an hour from there, near the state fish-hatching station at Chinook, Wash."

"Just across the river, then?"

"Exactly. The way I look at it, you're not at all likely to have anything to do with fur seal if you go into the Bureau, certainly not for a good many years. So you can't judge the Fisheries' scope from that, and you ought to see the work that will probably fall to your lot."

"Very well, sir," said the boy, "I'll go gladly, and thank you ever so much."

"I'll drop a note to Professor Todd, then," the lieutenant said, nodding as he turned away, "and as we may be delayed a few days in Valdez, the letter will reach him before you will."

On their arrival at the Alaskan town, Colin learned that some time would elapse before the trial of the Japanese prisoners, as the court would not be in session until later in the summer, and he was told that when his deposition had been taken, there would be no need to keep him as a witness. Accordingly, after the boy had related the story of the discovery and of his entire connection with the affair, he was told that he might leave.

As the revenue officer had expected, within a week a steamer left Valdez for San Francisco, calling at Astoria on the way, and Colin took passage aboard. Aside from meeting on board an old shell collector, who taught him a great deal about the principal valuable sea shells of the world, the voyage was without incident, and he arrived in Astoria in time to proceed the same afternoon to the cottage of the professor, where he was to stay that night, having found a letter of welcome awaiting him in Astoria.

Reaching the house he presented his letter of introduction, and was cordially greeted. Finding that the boy was really interested, his host took him to a tiny laboratory of his own, where he was experimenting on the various diseases of the salmon and the trout.

This gave Colin an entirely new outlook on the Fisheries' activities.

"I never thought of fishes being sick before!" he exclaimed. "Are there fish-doctors in the Bureau?"

"There's a large division of the service given to that very work," the professor replied, "only there are so many millions of fish that we do not try to cure the individual, but only endeavor to prevent the disease. You know what the work of a veterinary is?"

"Of course," the boy responded.

"And you know that the United States Government has an inspector at every place where cattle and sheep and pigs are slaughtered to see that no diseased animals are sold?"

"Yes," the boy answered, "I have heard of that, too."

"Since there is almost as much fish eaten in this country as there is meat," the professor continued, "Uncle Sam sees to it that no diseased fish are sold for food."

"I don't quite see how," the boy responded; "there can't be an inspector at every place where they catch fish."

"Certainly not, but as long as there is no disease among fish, there can be no diseased fish. We try to prevent the diseases. Now here, for example," he continued, "are a lot of fish that have a kind of malign growth. It comes very frequently among the trout and salmon that are artificially raised, and sometimes we find it among fish that have been reared in a state of nature, and I have been working for some time on this and I hope this year—or at all events by next season—to be able to show the cause of the disease. That is really my problem, Colin, but the details of it are too complicated to explain easily. But you have come at a particularly good time," he continued, "because I have been wanting to do an experiment which I thought might interest you, and I waited until you came. If you like, we'll go out to-morrow."

"I should, ever so much," Colin exclaimed. "What's the experiment?"

"When the salmon come in from the sea," the professor began, "there is a great deal of hesitation among them sometimes before they go up the river to spawn, and we want to find out whether they go back to the sea again, whether they swim directly up the stream, or whether they remain in the brackish water at the mouth of the river."

"If you don't mind my saying so, what is the use of knowing?" asked Colin. "I mean, what does it matter as long as the salmon spawns?"

"The salmon is one of the most important food fishes of the country," the professor said rebukingly, "and it is as important for us to know all about its habits as it is to know about the way a grain of wheat grows."

"I hadn't thought of that," Colin said, a little shamefacedly. "I suppose everything really is important, no matter how small."

The professor smiled at him.

"If you have much to do with studying fish," he said, "or, indeed, with any kind of science, you will find out it is always the little things that tell the story. Take the grain of wheat again. If one kind of wheat ripens two days earlier on an average than another kind, you might think that so small a difference wouldn't be of great importance, but those two days might—and often do—make the difference between a good crop and one which is frost-bitten and spoiled."

"That's a lot easier to see," agreed the boy. "But, sir," he objected, "you can pick out one little bit of a field and work on that, and it will 'stay put.' Fishes wander all over the place."

"We want them to do so, my boy," was the reply.

"How can you work on separate fish? One looks so like another!"

"And for that very reason we're going to tag them."

"Tag them?"

"With a little aluminum button fastened to their tail, just as bad youngsters fasten a tin can to a dog's tail. Every tag has a number, and we use aluminum because it corrodes rapidly in salt water."

"Then I should think," said Colin, "that was the very reason why you shouldn't use it."

"Why not?" asked the professor mildly. "We know that the salmon are not going to stay in the salt water, because they are going up the river to spawn. If, therefore, we catch a fish in the nets higher up stream, with the tag bright and shining, we know that it hasn't been in salt water at all; if dull and just a little worn away, that the fish with that tag has been staying in the brackish water near the mouth of the river; but if it is deeply corroded, that the fish returned to sea for a time. As you see, a good deal of information is gathered that way. But in the morning you will have a chance to see how it is done, and then the results—when they are published—will seem more interesting."

"Have you been associated with the Bureau of Fisheries, Professor Podd?" Colin asked.

"Not directly," the other replied. "I should have enjoyed it, and it seems to me a work of the first importance, but every man is apt to think that about his own work, or work that is like his own. But I can tell you what decided me, nearly twenty years ago, to give all my spare time to the fishery question."

"What was that?" asked Colin.

"It was a phrase in a lecture that Dr. Baird, the founder of fish culture in America, was giving about the need of the work. He pointed out that there was more actual life in a cubic foot of water than in a cubic foot of land, and closed by saying, 'The work of conserving the Fisheries of the United States will not be finished until every acre of water is farmed as carefully as every acre or land.'"

"I never quite thought of it as farming," said the boy.

"Nor had I, before that time," the professor said. "But ever since then I have seen that we of the present time are the great pioneers, the discoverers, the explorers of this new world. Instead of blazing our trail through a wilderness of trees we dredge our way through a wilderness of waters; instead of a stockade around a blockhouse to protect us against wild beasts and wilder Indian foes, we have but a thin plank between us and destruction; instead of a few wolves and mountain-lions to prey upon the few head of stock we might raise, we have thousands of millions of fierce, finny pirates with which to do battle, and we work against odds the old pioneers could not even have estimated!"

"That's great!" cried Colin, his eyes shining.

"The surface of the sea," the professor continued, warming to his subject, "reveals no more of its mystery than the smoke cloud above the city tells the story of the wild race of life in its thronging streets, or than the waving tips of a forest of mighty trees reveal the myriad forms below. Each current of the ocean is an empire of its own with its tribes endlessly at war; the serried hosts of

voracious fish prey on those about them, fishes of medium depth do perpetual war upon the surface fish, and some of these are forced into the air to fly like birds away from the Nemesis below."

"And much is still unknown, isn't it?"

"We are discovering a new world!" was the reply. "No one for a moment can deny the greatness of the finding of America, and Columbus and the other early navigators are sure of immortal fame, but even so, what was the New World they found to the illimitable areas of unknown life, in the bottom of the sea, that have been made known to man. Think of the wonder that has been revealed by the *Challenger* and other ships that have explored the ocean beds!"

"There is still a great deal unknown, isn't there?"

"Still an unknown universe! Lurking in the utter darkness of the scarce-fathomed deeps of the ocean, what Kraken may not lie, coil on coil; what strange black, slimy, large-eyed forms do their stealthy hunting in perpetual night by the light of phosphorescent lamps they bear upon their bodies? Many of these there are, every year teaches of new species. The land—oh! the land is all well known, even the Arctic and Antarctic regions no longer hide their secrets, but the ocean is inscrutable. Smiling or in anger, she baffles us and her inmost shrines are still inviolate."

The professor checked himself suddenly, as though conscious of having been carried away by enthusiasm.

"We'll try and get at some of the secrets to-morrow," he said, "but it will mean early rising, as the trap is to be hauled at slack water."

Acting on the hint, Colin bade his host good-night, but his sleep was fitful and restless. The sudden passionate speech of the grave scholar had been a revelation to the boy, and whereas he had felt a desire for the Fisheries Bureau before, he knew now that it had been largely with the sense of novelty and adventure. But the professor's words had given him a new light, and he saw what an ideal might be. He felt like a knight of the olden time, who, watching his armor the vigil before the conferring of knighthood, had been granted a vision of all his service might mean. He knew that night that the question he was to ask his father could have but the one answer, that the great decision of his life was made, his work was cut out to do.

Shortly after daybreak the next morning, Colin was called and he dressed hurriedly. After a hearty breakfast in which steel-head trout figured largely, he went down to the pier on the water and was not sorry to have the chance of showing his host that he was a good canoeist.

"How large is the work of the Bureau now, Professor?" asked Colin, as the light craft shot down the magnificent stretches of the Columbia River.

"Over three and a half billion eggs and small fish were distributed last year, if I remember rightly," was the reply. "Of course, a large proportion of these fish did not reach maturity, but perhaps half a billion did so, and half a billion fish is an immense contribution to the food supply of the world."

"But aren't there always lots of fish in the sea?" asked Colin. "When you come to compare land with water it always looks as though there must be so many that the number we catch wouldn't make any sort of impression on them."

"Think a bit," said the professor. "You've just come down from the Pribilof Islands. How did you find matters up there? Had the catching of seals been harmful, or were there so many seals still in the sea that it didn't matter what line of hunting went on?"

"Of course, pelagic sealing had nearly killed off the entire species," said Colin, "but, somehow, fish seem different. Oh, yes, I know why. Seals only have one pup at a time and fishes have thousands of eggs."

"That's a very good reply," the professor agreed, "but why was it that pelagic sealing was so bad? Was it done all the year round?"

Millions of these Hatched Yearly.

Brook Trout just hatching, showing fry with egg-sacs still attached.

Courtesy of the National Geographic Magazine.

"No," said Colin, "principally when the females were coming to the spawning ground."

"And the Pribilof Islands are only a small place. Especially when compared to the range of oceans the seal cover during the rest of the year?"

"Very small."

"Then," said the other, "it is easy to see that the respective size of land and water has very little to do with the general fishery question. But if a seal or a fish must come to the land or to narrow rivers to spawn, it follows that man possesses the power to determine whether spawning shall continue or not, doesn't it?"

"Yes," agreed Colin, "I suppose it does."

"And if you protect the seals, the herd will increase."

"It ought to."

"Very good. That is just the work we are doing here. The salmon come into fresh water to spawn—just like shad and a number of other species of fish—and when you kill a salmon just about to ascend the river, you destroy at the same time the thousands of eggs she bears."

"But I thought salmon were always caught running up a stream?" said Colin in surprise.

"They are," was the quick response; "by far the larger number are caught that way, and as long as a certain proportion go up the stream there's no great harm done. But if every one of the salmon is caught, as happens when nets are put all the way across a stream, there will be none to spawn, and in a few years there will be no fish in that river."

"Do the fish always return, when grown up, to the river in which they spawned?"

"That is disputed. But the large proportion of such fish do not travel very far from the mouth of the river in which they were born and the natural impulse for fresh water at spawning-time leads them naturally to the nearest stream. So, it is imperative that some fish be allowed to go up-stream, or in other words, that salmon-catchers allow a certain proportion to escape their wheels and nets."

"They ought to be willing enough to do that, I should think," said Colin; "it's for their own good in the long run."

"A lot of them want quick profits now, without any regard for the future," his host said scornfully. "Of course, there are laws for fishery regulation in many of the States, but inspectors have their hands full in preventing violations. In Alaska, which is a territory still, that supervision is done by the government through the Bureau of Fisheries."

"It must be a little aggravating to the salmon men, just the same," said Colin thoughtfully, "when they are trying to keep their canning factories going full blast, to have to allow half the catch to go on up the stream. But," he continued, "why don't they catch the salmon coming down the stream again? I should think that would settle the whole question."

"It would," said the professor, "if they came down! But they don't. Every single salmon, male and female, that goes up the river in the spawning season dies up there. None of them ever comes down alive."

"I don't think they did that way in Newfoundland!" ejaculated Colin in surprise. "When I was staying with my uncle there I saw lots of salmon, and it seemed to me that they went down the river again."

"They did," was the reply. "The Atlantic or true salmon does not die after spawning, but not a single fish of any one of the five different kinds of Pacific salmon ever spawns twice. Every yard of the shores of the upper reaches of Pacific coast rivers is covered almost solidly with dead salmon from September to December!"

"How awful!"

"It makes some places uninhabitable," the professor replied. "Where a market is near enough, the dead fish are collected and sold for fertilizer."

"Is it the fresh water that kills them?"

"No," was the reply; "that is one of the most curious features of the life-history of the Pacific salmon. As soon as the fish are nearly ready for spawning, all their digestive parts shrivel up, so that they can't eat. In the male salmon, too, the end of the upper lip turns into a sort of hook so that the fish can't even open his mouth wide enough to eat anything. Then in the fresh water their scales turn slimy and, as they often get injured trying to leap falls and rapids, all sorts of skin diseases attack them. A salmon in the upper reaches of the Columbia headwaters is a pitiful wreck of the magnificent fish that entered it to spawn."

"Do they go far?"

"As much as a thousand miles," was the reply. "The quinnat and blue back—or the spring and the sockeye, as they are generally known, take the long journeys, but the silver or coho, and the humpback and dog salmon keep to the small streams near the sea. The young fry cannot live in salt water and the instinct of the salmon is to swim up-stream as far as possible, no matter what obstacle is in the way. When they have gone to the very limit, the salmon make pits and holes in the gravel and sand at the bottom of the stream for nests, and drop the eggs in these. The male salmon immediately afterwards floats over the nests and does his share in making sure that the eggs will hatch out."

"How big are the salmon?" asked the boy.

"You'll have a chance to see," the professor answered, as he swung the canoe in to the wharf, at the state hatchery station, "because we're going to measure the ones we tag this morning."

The foreman and one of the men of the station were waiting for them in a good-sized motor boat, towing behind which was a curious-looking affair composed of two small barrels fastened together by long slats.

"Don't you know what that is?" queried the professor, noting Colin's puzzled look.

"No, sir."

"That's a live car. The barrels at each end have enough water in them to sink them to a certain depth. Then the slats, as you see, are nailed two-thirds of the way around the barrels, leaving just enough space for the water to flow in and out freely. They put the fish in that to tow them home alive. The slats are better than netting because sometimes the fishes catch their scales in the meshes and get hurt."

The run to the fish-trap was made in a few minutes, and the boat went inside to the 'pound,' the net was partly hauled up, and the professor took out his punch and the buttons. Colin had put on a pair of rubber boots and oilskin trousers, as had all the rest of the party, and he was ready for anything that came along.

"Do you want my slicker?" the professor asked him. "You're apt to get splashed."

"I don't mind a bit, thanks," answered the boy, rolling up his sleeves; "a little shower-bath will feel good on a hot day like this!"

"All right, then," the leader of the party declared, "we'll give you a chance to make yourself useful. Here you are!"

Colin took the large flat-bottomed net and awaited further instructions.

"Catch one of the salmon," he was told; "never mind the rest of the fish. And," he was warned, "don't bring the net clear out of the water."

"Very well, sir," the boy replied, then his curiosity getting the better of him, he asked, "Why not?"

"Because if you do, the salmon will struggle against the meshes of the net, bruise himself, and probably scrape off some scales. I told you how easy it is for a fish to get diseased if he loses any of his scales. If you keep the net about four inches below the water, the fish has the resistance of the water to fight against, and it will tire him out quickly without doing any harm."

"All right," Colin answered, and commenced scooping for the fish. In a minute or two he had a large twenty-pounder in the net and he raised it until the bottom was a little below the water, as he had been told.

"You're right about getting wet!" cried Colin, laughing, as the salmon began to whirl and plunge and dance in the net, sending a shower of water all over him and nearly blinding him by the force with which the drops of water struck as they were splashed upwards by the powerful strokes of the fish's tail.

The instant the salmon stopped struggling, the hatchery boatman seized it by the tail with a strong grip, swung it clear out of the net and over his left arm, laying it immediately on the measuring platform. This consisted merely of a wide board with an upright at one end, a rule giving both metrical and standard measures being nailed to the side of the board. Instantly the measurer called out the length and the professor noted it down, the hatchery foreman—famous for his expertness in judging the weight of a fish—calling out the weight to be recorded. Laying down his pencil, the professor then, with a small punch, made a tiny hole in the tail-fin of the salmon, the fish having been thrown over the captor's left arm again, slipped an aluminum button through the hole, and riveted it securely. The entire process took less than a minute and a half, and by the time the salmon had been released and tossed into the water again, Colin was ready with another fish.

"I don't see why the fish don't die as soon as they come out of the water!" exclaimed Colin.

"For nearly a minute, some fish breathe better out of the water than in it," the professor answered, "but after that the gills stick together and the fish strangles. Two or even three minutes will not injure salmon, and some fish will recover if they are out of water for hours. Indeed, there are some fish that live out of water most of the time."

"Live out of water?" the boy said in surprise.

"Certainly. Some kinds of fish, at least, can't stay in the water very long, but remain perched up on the rocks."

"Perching like birds?" Colin said incredulously.

"I know that sounds a little improbable, but it's true, just the same," the professor said, smiling. "This is a Fisheries story, not a 'fish story.' There's a difference. They come from Samoa and belong to the skippy family. Most of them live on the rocks, and they jump from rock to rock instead of swimming. Some of them even are vegetarians—which is rare among fish—and their gills are smaller and stouter. Plenty of them are only in the water for a little while at high tide, living in the moist seaweed until the tide rises again."

Colin was silenced, and he went on vigorously dipping up salmon.

"How many fish are you going to tag?" the boy asked, when a couple of hours had passed by.

"Sixty," the professor answered, "and we must be nearly through, for I have only a few buttons left."

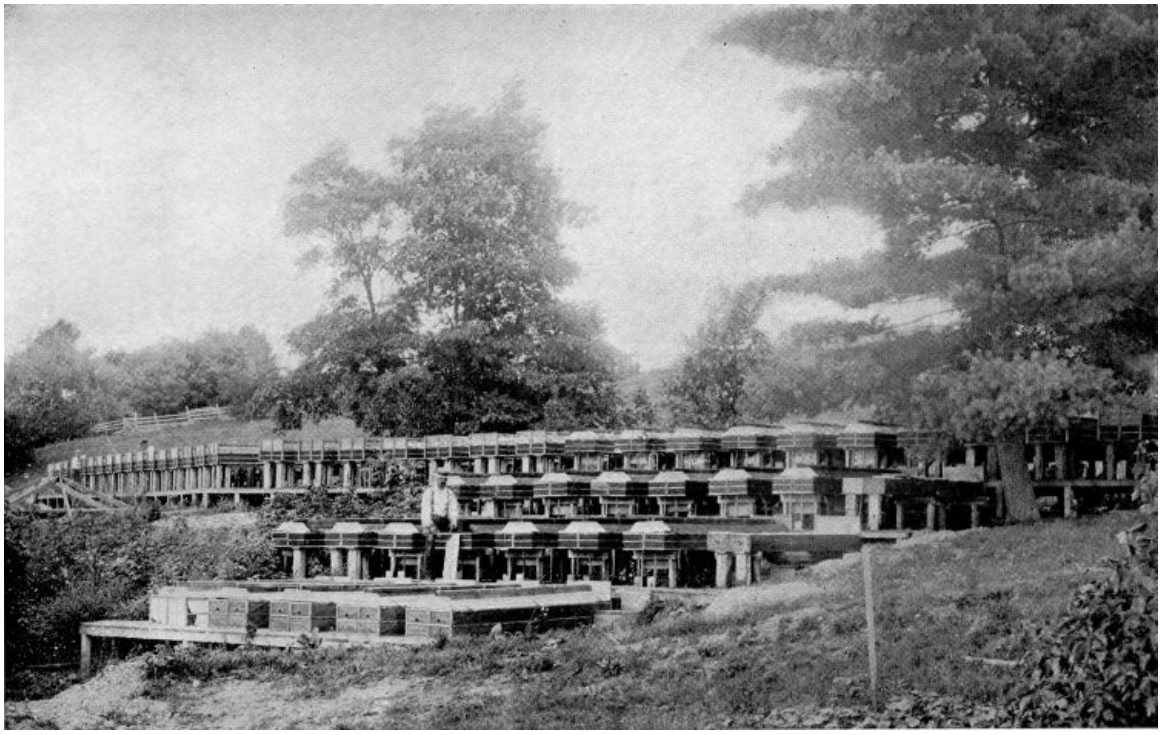
Secretly the boy was much relieved, for his back was tired from stooping and netting heavy fish for two hours, but he would have worked to utter exhaustion rather than complain. However, within another quarter of an hour, the last fish was dropped over the side and the party was on its return journey.

"Why don't you stop and see the hatchery?" suggested the professor, in return to a host of questions put to him by the boy concerning salmon culture.

"I'd like to, ever so much, if I might," was the answer, and Colin looked up at the foreman.

"Come right along," was the latter's immediate response. "It isn't much of a place to look at, but you can see whatever there is to see."

The hatchery itself was simple and bare, as the foreman had suggested, consisting merely of a row of boxes arranged in such a way that water flowed through them constantly, bringing a steady supply of fresh water without carrying away the light eggs and tiny fry. Colin was thoroughly interested, and followed the foreman from place to place, eagerly watching the processes of hatching the fish and asking unending questions.



Hatcheries in Maine for Landlocked Salmon.

Courtesy of the U. S. Bureau of Fisheries.

"Here," the man said, after he had answered a dozen or more queries. "I'll show you just how it's done and you'll learn more from watching than I could tell you in a week of talk."

He led the way to a large pond not far from the hatchery, which was connected with a small stream, the water of which was almost entirely fresh.

"It's a little early yet for the autumn run," the foreman said, "but maybe there's some salmon ready for their eggs to be taken. We'll have a look, anyway."

"Are there any chinook in there?" queried Colin, who was feeling a little proud of the knowledge he had acquired that morning as to the way of distinguishing the varieties of salmon.

"Don't want chinook," was the reply; "they have got to go away up the river to spawn and wouldn't be in shape if we tried to use them here. We only raise humpback and dog here, the hatcheries for chinook and silver salmon are away up the river."

"Run by the State or the Government?" queried the boy.

"Both," was the reply, "and quite a few are managed by commercial fish companies who are as anxious as any one to see that the annual salmon run does not grow smaller. Their living depends upon it."

At his request one of the men commenced scooping up some of the salmon in the pool to see if any of them were ripe, and meantime the foreman—who was still wearing his oilskins—picked up a tin pail, holding it between his knees. In a minute or two the man came in holding a ripe female salmon.

"Now watch," the foreman said to Colin, "and you can see the whole performance."

He seized the salmon by the tail, and all the eggs ran down toward the head. Then, holding the fish head upward, he pressed it slightly, and the eggs ran out from the vent rapidly, striking the bottom of the pan with considerable force. The foreman had hardly got the eggs when his assistant came in with a male salmon, and the same plan was repeated, the milt falling upon the eggs. Both male and female salmon then were returned to the pool. The eggs and milt were shaken violently from side to side until thoroughly mixed, a little water being added to help the mixture. Then he took the pail to the faucet.

"But you're washing the milt off again!" cried Colin, as the foreman filled the pail with water.

"It's had plenty of time to work," was the answer, and the eggs were poured into a flat pan and washed several times.

"Now we'll put just a little water in the pan," the foreman continued, "and leave it here to swell."

"Why should it swell?" asked Colin.

"The egg isn't really full when it comes from the mother fish," the foreman answered, "the yolk rattles around inside the shell, but after it has been mixed with the milt, it begins to suck up water, and in about half an hour it's full."

"What happens next?" queried Colin.

"That's about all. We put the eggs in frames so that the water has a chance to circulate freely,

and then we go over the frames once or twice a week to pick out any eggs that may happen to die or not to grow just right."

"How long does it take before a fish comes out?" Colin asked interestedly. "About a couple of weeks?"

"Weeks!" was the surprised answer; "we look for hatching to begin in about five months, and during all that time every tray of eggs is picked over once or twice a week. That keeps dead eggs from infecting live ones."

"You must keep them a long time, then?"

"Nearly a year altogether. Those in that trough right behind you are just hatching, they're from the first batch of spawn in the early spring run. Most of them are hatched out now, for you see only a few eggs in the tray."

Colin looked in and saw, as the foreman said, only half a dozen eggs left in the tray, while in the shallow water of the trough below were hundreds of tiny fish, like transparent tadpoles still fastened to the yolk of the egg. Some, which were just hatched, were less than three-quarters of an inch long, and scarcely able to move about in the water because of the great weight of the yolk about the center of their bodies. A few had consumed a large part of the sac.

"It'll take them about six weeks to get rid of the yolk," the foreman said, anticipating the boy's question, "and if they were in a natural stream they would be able to look after themselves. We feed them tiny grubs and worms and small pieces of liver. From that time on it is merely a question of giving them the proper food and keeping the troughs clean. When they are five or six months old we set them free."

"Do you do any work except salmon hatching here?" Colin asked, as, after a morning spent in the station, they walked toward the pier.

"No," the foreman answered, "we distribute a million and a half young fish every year and that keeps us busy enough."

"Well," said Colin, shaking hands, "I'm ever so much obliged, and I really feel now as if I knew something about a hatchery. And I've had a share in one experiment, anyway!"

On his return to the cottage he found the professor getting out fishing-tackle.

"Going out again?" queried Colin.

"I thought you might like to try a little sport-fishing," was the answer; "you said you were going down to Santa Catalina, and you might as well get your hand in. You can stay over another day, can't you?"

"I suppose I could," Colin answered, "and I should like to catch a really big salmon with a rod and line, not only for the fun of it, but because I happen to know that Father's never caught one, and I'd like to beat him out on something. It's pretty difficult, though, to get ahead of Dad!"

The professor shook his head with mock gravity.

"That's not a particularly good motive," he said, "and I don't know that I ought to increase any boy's stock of conceit. It is usually quite big enough. But maybe you won't catch anything, and I'll chance it."

"Oh, but I will catch one," Colin declared confidently; "I'm going to try and get one of the hundred-pounders that I've read about."

"You'll have a long sail, then," his host replied, "because fish of that size don't come far south of Alaskan waters. Twenty-five or thirty pounds is as big as you can look for, and even those will give you all the sport you want."

"Very well," Colin responded, a little abashed, "I'll be satisfied."

"It's rather a pity," the professor said, when, after lunch, they had started for the fishing-grounds in a small catboat, "that you haven't had a chance to go up to The Dalles to see the salmon leaping up the falls and the rapids. I think it's one of the most wonderful sights in the world."

"I've seen the Atlantic salmon jump small falls," Colin said, "but I don't think I ever saw one larger than ten or twelve pounds."

"I have seen hundreds of them fifty to eighty pounds in weight leaping at falls in the smaller Alaskan rivers. I remember seeing twenty or thirty in the air at a time while the water below the falls was boiling with the thousands of fish threshing the water before their leap."

"How high can they jump?" asked Colin.

"About sixteen foot sheer stops even the best of them," the professor said, "but there are not many direct falls like that. Nearly all rapids and falls are in jumps of five or six feet, and salmon can take that easily. Still, there is a fall nearly twenty feet high that some salmon must have leaped, for a few have been found above it, and they must either have leaped up or walked round —there's no other way."

"How do you suppose they did it?"

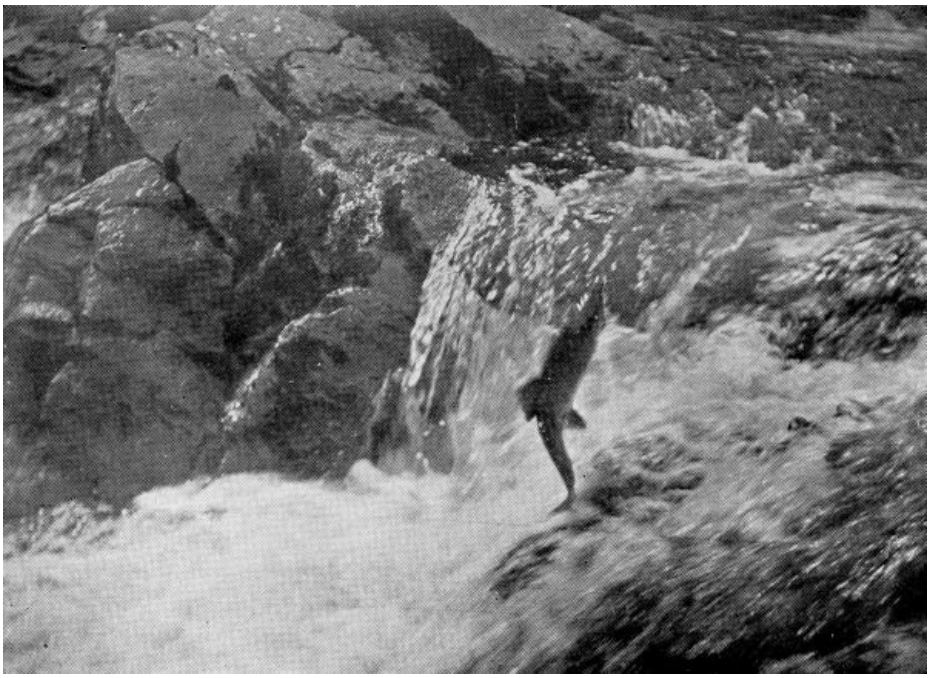
"In a very high wind, probably," the professor answered; "a gale blowing up the canyon might just give the extra foot or two at the end of a high leap."

As soon as they were about four miles out, the sail was taken in and, following the professor's example, Colin dropped his line over the stern. The shining copper and nickel spoon sank slowly, and the boy paid out about a hundred feet of line. Taking up the oars and with the rod ready to hand, Colin rowed slowly, parallel with the shore. Two or three times the boy had a sensation that the boat was being followed by some mysterious denizen of the sea, but though in the distance there seemed a strange ripple on the water, nothing definite appeared, and he forgot it for the moment as the professor got the first strike.

With the characteristic scream, the reel shrilled out, and the fish took nearly a hundred feet of line, but the angler held the brake so hard that the strain rapidly exhausted the fish, and when it turned toward the boat, the professor's deft fingers reeled at such a speed that the line wound in almost as rapidly as the rush of the fish. As soon as the salmon saw the boat it tried to break away, but its captor had caught a glimpse of the fish, and seeing that it was not too large for speedy action, reeled in without loss of time, and gaffed him promptly.

Thirty-pound Atlantic Salmon Leaping Falls and Rapids in a Newfoundland River.

By permission of H. K. Burrison.



Eighty-pound Pacific Salmon Leaping Waterfall on an Alaska River.

Courtesy of the U. S. Bureau of Fisheries.

"Small chinook," he said, as he tossed him into the boat.

He had hardly finished speaking before Colin made a grab for his rod, and the catch was repeated in almost the same manner. This went on until five fish had been caught, the last one, which fell to the professor, putting up the most gamy fight of them all. But still it was too easy for real sport.

The ripple which Colin had been watching had come nearer, and in the catching of the last fish, the boat had been brought quite close to it.

Then, noiselessly, and like a strange vision, out from the undulating ripples rose slowly a creature more fantastic than the boy's wildest dreams. The head was green, with large unwinking, glittering eyes. In slow contortions, the body, of a transparency that showed the light through, writhed like a tremendous ribbon-snake, and a sharp row of serrated fins surmounted all its length, from which, near the head, scarlet streamers floated like a mane. A moment thus it held its head erect, then sank below the surface. The boy sat with his eyes fixed upon the spot where he had seen this weird appearance, unknown and ghostly-seeming.

"Colin," said the professor, and his tone was so imperative that the boy turned sharply, "what is the matter? What are you watching?"

"I don't know, sir," said the boy; "I don't know much about fish, and I was waiting until it came nearer. I was going to say——"

He stopped suddenly.

"What?" asked the professor, a little impatiently.

"You'd laugh at me," the boy answered.

"You saw——"

"I saw a big green head with large eyes and spines on its back put its head out of the water," Colin said doggedly, "and it had a bright red mane. I couldn't think of anything but—but,"—he hesitated and then gulped out,—"a sea-serpent."

He half feared to look at his companion, feeling that a pitying smile would greet his news, but after a few seconds' silence, he glanced up and saw that his fellow-fisherman was looking grave and thoughtful. At that instant the boy felt a quick snap at his line and he struck, the salmon whirling away instantly. It was a good fight, and the fish was full of grit, sending a curious thrumming sensation up the line that set every nerve aquiver. At last he got the fish stopped, and had just started to reel the big salmon in, when the apparition thrust its head out of the water not twenty feet from the boat. It distracted Colin's attention, and a few seconds later his line snapped.

"The salmon's got away," said Colin disgustedly.

"What does that matter?" said the professor. "We've something else to do."

"What?"

"Catch your sea-serpent," was the reply, as the older man pointed to the green and scarlet gleam in the water.

"It must be thirty feet long," Colin said, then realizing that his tone suggested that he was afraid, he added boldly, "but I'm game. What is it, anyway?"

"You're not so far off in calling it a sea-serpent," his companion said; "at least, it's more like the fabulous monster than any other fish that we know."

"But how are you going to catch it?" the boy asked.

"By hand," the professor replied, slipping off his outer clothes.

"You mean you're going in after it?" queried the boy with amazement.

"Certainly," the other answered; "it's harmless enough."

"It doesn't look it," said Colin, but he was not to be outdone, and prepared to follow his host into the water.

They ran the boat close to the creature, which swam but feebly despite its immense length, and the professor plunged over the side, holding the loop of a rope. A few strokes took him to the long, ribbon-like form, which was not thicker than a man's body, and he threw his arms about it, back of the head. The fish struggled weakly, but the professor did not let go, and in a few seconds Colin had brought up the boat. He then took the rope, which had been passed around the soft and flabby body. Then, jumping overboard also, the boy helped the professor lift the fish from below, for the flesh was so soft that a rope would cut right through it. With great exertion, for the creature was heavy, they got it on board, half swamping the boat in doing so. Despite its size, the strange visitor from the deep seemed scarcely able to struggle and lay motionless in the boat.

"What is it?" asked Colin, as he gazed on the snake-body and the strange head which, with its brilliant crimson mane, was reminiscent of some fiery horse of ancient legend.

"What can it be?" he repeated wonderingly.

"An oarfish," the professor answered.

"That isn't what I think it is," Colin replied. "I'm sure it's something quite different."

"What?" asked the professor, smiling.

"I believe something has killed the sea-serpent at the bottom of the sea and this is its ghost!"

CHAPTER V

CLUTCHED BY A HORROR OF THE DEEP

In order that the valuable specimen of the oarfish might be properly preserved, for the creature was so soft-fleshed that it would quickly shrivel in the hot sun, the professor accompanied Colin to Astoria the following morning, and shortly after they landed, the city was buzzing with news of the wonderful find. Before the boy left for Santa Catalina that evening he found his name in all the afternoon papers as being one of the men who had "caught the sea-serpent." As this was the first specimen in perfect preservation that had reached any city of the United States and, indeed, only the sixth ever reported from American shores, a great deal of interest was excited, and Colin was compelled to give an interview to a reporter, telling the story of the capture. He was sorry that his brother—to whom he had sent the blue fox—was not with the rest of the family in Santa Catalina, so that he could tell him all about it, but the younger lad was at a boys' camp.

Making a stay of only a couple of hours in Los Angeles, the boy went from there straight to San Pedro, where he took the steamer for Avalon, the only large town on Santa Catalina, and the most famous place in the entire world for taking big game fish with rod and reel.

The passage was only of two hours' duration, and the weather ideal. The water of the channel was like a mirror, but the daily breeze sprang up at eleven o'clock, its accustomed hour.

Although no more attentive to scenery than most boys of his age, Colin fairly cried aloud with admiration as the steamer rounded the point and turned into Avalon Bay. Almost a perfect semicircle, the beach of glistening white sand enclosed a basin of turquoise sea in which were reflected the dark, rich tones of the cliffs, all glowing like an opal beneath the sun, while above rose the hills covered with the wild lilac and greasewood of California. Even the tame sea-lions which frequent the harbor and follow incoming boats, and which frequently are to be seen hauled up on small fishing-craft, seemed to fit wonderfully into the scene. A passenger who heard the boy's exclamation of delight, turned to him.

"That's the way I feel about it," he said. "I think it more beautiful every time I come."

"It makes me think of an abalone shell," Colin remarked thoughtfully, "before the outside is polished; the bay looks just like the glow of the shell inside and the sand-hills resemble the rough outside of the shell, with barnacles growing on it."

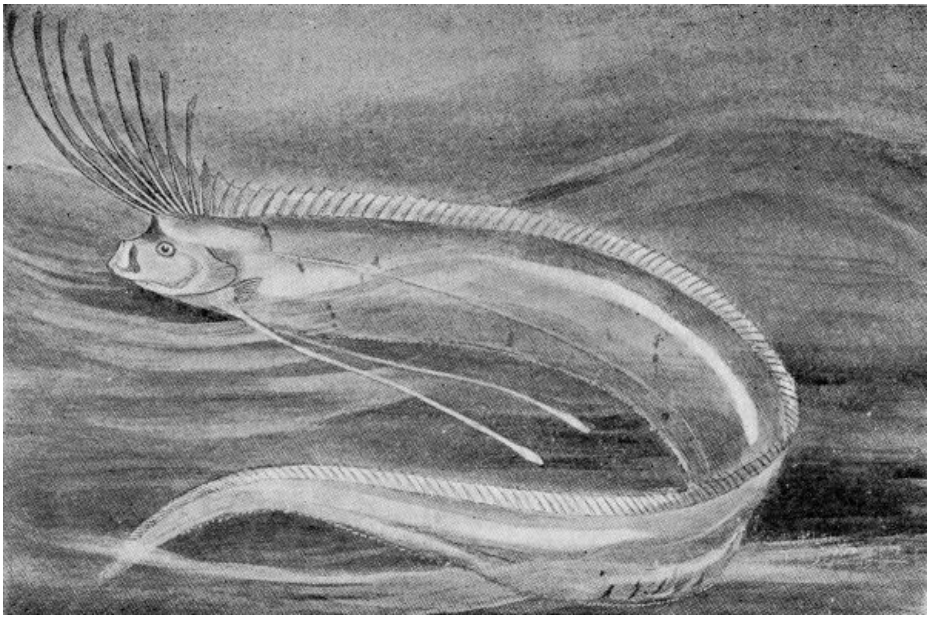
"Perhaps that is why it is called Avalon?" his companion said; "abalone, Avalon—it's not improbable, though I never heard such a derivation before; the Vale of Avalon in Pennsylvania is supposed to have been the prime factor in giving the name. But it's a wonderful place in itself, and besides, there's not one of those hundreds of boats moored in the harbor but could tell some thrilling tale of big game at sea. Look," he continued, as the steamer drew near to the entrance of the harbor, "there's a chap who's hooked to something big. By the way he's playing the fish it's probably a leaping tuna. Wait a minute and I'll tell you."

He unslung his fieldglasses and focused them on the boat.

"Yes, he's got a tuna," he continued, "for the flag is flying."

The news spread rapidly over the boat, for almost every one on board was going to Avalon for the angling, and the capture of a large tuna is an event. The glasses were handed from person to person, and presently were passed to Colin, who noted with eager interest the little motor-boat and the big flag. Then he turned the glass on the people in the boat, and flashed out excitedly:

Sea-Serpent Stranded on California Coast.
Showing length of small specimen and its semi-transparency.
By permission of Prof. David Starr Jordan.



The Sea-Serpent Caught by Colin.
Oarfish, thirty feet in length, with flaming red upstanding mane, and a knife-like body less than three inches in thickness.
By permission of Prof. David Starr Jordan.

"Why, that's Father!"

"He's in luck, then," said the boy's companion. "I hope I get a chance this season. Still, it's a good omen, seeing a catch like this when coming into the harbor."

"Sure thing," said Colin confidently, "there are probably lots of them this season. Do you suppose Father will land him?"

"About nine out of ten get away," was the reply, "and it takes a good fisherman to bring them to the gaff. Has your father been here before? Perhaps I may know him."

"He comes nearly every year," Colin answered. "Dare is his name, Major Dare."

"Oh, you're Dare's son, are you?" was the response, as the older man held out his hand. "I've known your father for years. He holds a blue tuna button, doesn't he?"

"I've never heard of it, if he does," Colin answered. "What's that for?"

"It is the greatest fishing honor that is to be got anywhere. Only about seventy members of the club have gained it; two, I believe, being women, and the second largest tuna ever caught on rod and line was brought to gaff by a woman angler. It is given for catching a tuna weighing over one hundred pounds, on a light rod."

"That must be fearfully hard to do," the boy said; "even a twenty-pound fish is a strain to a light rod."

"It is difficult," was the reply, "but the club rules require the use of a rod the tip of which shall be not less than five feet long, weighing not over sixteen ounces in weight, and a line not over a

'twenty-four' or smaller than the usual trout-line. With this equipment, to conquer a tuna weighing over one hundred pounds is an angling achievement of the highest rank, and for this the blue tuna button is given by the club."

"And Father never told me!" Colin said reproachfully, watching the contest with the fish as well as he could considering his distance from the scene of action.

"Major Dare is a thorough sportsman," the angler said, "and I suppose he thought it would look like boasting. What's happening there in the boat?"

"It looks as though they had started out to sea," Colin answered, handing back the glass.

"That's what's the matter!" the angler said. "By Jonah's whale, how she is flying through the water!"

The two watched the boat until a turn of the cliff hid it from sight and then, Colin, turning round, saw that the steamer was nearly at the pier, close enough for him to distinguish his mother and sister waiting there and waving to attract his attention. He signaled enthusiastically in reply, and in a few minutes the steamer was alongside the wharf.

The greeting was most exciting, for the boy was simply bursting with news, and there had been a good deal of anxiety felt by his parents on his behalf while he had been wandering in the Behring Sea. But their talk was broken in upon by an enthusiastic angler friend, who begged Mrs. Dare to come to the extreme end of the pier and watch the battle with the big tuna.

"Oh, Mother," eagerly said the boy, "do you mind if I jump in a boat so that I can go out and watch Father better? I'm sure he wouldn't object."

"I think I would like to have you with me for a little while, Colin," his mother said with a gentle smile, "after you have been away so long. But you are just the same, after all, eager to do everything immediately. I know you would be happier in going, so you can desert us if you like."

"I don't mean that, Mother!" said the boy, feeling a twinge of self-reproach.

"No, I know. But you can tell us all the rest of your adventures when you get back. Lucy quite thinks that you have become a sort of 'Robinson Crusoe.'"

Colin gave his little sister—of whom he was very fond—an unobserved hug, and then fairly sped down to the end of the pier and called a boatman to take him off. The boatman, who was a native of the place, and to whom everything connected with angling was an old story, laughed at the boy's excitement.

"Goin' to catch a tuna with your hands, sir?" he asked, seeing that the boy was not carrying any fishing-tackle.

"No," the boy answered, "but I just came in on the steamer and, as we passed the point, saw Father's boat, and he seemed to have something big on the line, so I want to go out and see the fun."

"I heard Major Dare had a tuna this mornin'," the boatman said, casting off and starting the little engine, "although there haven't many of 'em showed up yet this season. Are you his son?"

"Yes," Colin answered, "I'm the oldest."

"I hope you're goin' to take after him, then," the boatman said approvingly; "he's a fine angler. Looks like the tuna was comin' in," he continued a moment later, as the boat with the flag flying came speeding into the harbor. But the fish was darting from side to side in short rushes, and it was evident that he was tiring.

"Hullo, Father," called the boy, as they came within hearing; "are you going to land him?"

"Is that you, Colin?" his father answered, without taking his eyes from his line, however. "Glad to have you back. Yes," he continued, answering the boy's question, "I think I'll land him all right, but I'm pretty well tuckered out, I hooked him over three hours ago."

Even recalling what the angler aboard the steamer had told him about the sportsmanlike rules that obtain at Avalon, it seemed absurd to Colin for any one to try and catch so heavy a fish as the tuna seemed to be, with a rod and line that would be thought light for trout.

"How big do the fish run here?" he asked the boatman.

"'Bout a thousand pounds for the biggest game fishes, them's black sea-bass," the man answered; "leastways there was an eight-hundred pounder brought in, and lots of us have seen bigger ones."

"But how can they catch fishes that size on a little bit of a spindling rod and a line so fine you can hardly see it?"

"They don't," was the reply, "not that big. The record black sea-bass, rod and reel, that has been caught here was four hundred and thirty-six pounds in the season of 1905. The biggest tuna—they're the hardest fighters of any fish that swims—was two hundred and fifty-one pounds, caught in the season of 1900. I reckon Major Dare's fast to one that's just a good size for sport."

"You're getting him, Father!" cried Colin, who had been watching the contest with the fish, while listening to the boatman.

"He's a fair size," said the boatman critically, "but not one of the really big ones, probably only about eighty or ninety pounds."

The fight came to a close sooner than Colin expected. Dexterously, Major Dare reeled in his line during a moment's pause while the fish sulked, bringing him to the surface, and his boatman, quick as a flash of light, leaned over the side and slipped the long, slender hook, or gaff, into the gills. But the end was not yet, for the tuna, with a powerful shake of his head, nearly pulled the man overboard, shook out the gaff, and commenced another panic-stricken rush.

Colin's father, however, with thumb on the brake of the reel, gave him absolutely no leeway, and the tuna was stopped within twenty feet, to be reeled in again. In the meantime, the gaffer had recovered his weapon, and as the big fish was brought to the side of the boat, he struck again, this time succeeding in holding against the rush of the fish, though he was pulled elbow-deep into the water. Then, standing on the gunwale, the gaffer lifted the head of the tuna and tilted the boat over as far as was safe, sliding in the fish as he did so, accompanied by the cheers of Colin. As soon as the tuna was fairly secure, a big square of canvas was thrown over it to keep it from pounding and threshing in the bottom of the boat.

"That was bully, Father!" said Colin, reaching out and shaking hands; "I'm glad I got here in time."

His father looked at him with a twinkle in his eye.

"How the deuce did you know I was out here?" he asked; "I thought the steamer was only just about due."

"I saw you as we came into the harbor," Colin answered, "and I yelled loud enough to be heard 'way back in Los Angeles, but you didn't pay any attention."

"I thought I heard some one shouting a while back," his father said, "but I was busy then and didn't have time to see who it was."

"How big is the tuna, do you think?"

"Not big enough to be listed. About eighty-five, I should say. What about it, Vincente?"

"Little more," the boatman said; "I think perhaps ninety."

"Nothing of a record, you see, Colin," his father said, "just a good morning's sport. But I want to hear all about your doings. It seems to me that you're developing into quite a sensational person with your fights with whales, and your sea-serpents, and all the rest of it. You've been writing good letters, too, my boy. I'm glad to see that you make use of your eyes when you're in strange places. Tell me how you got to Astoria, I didn't quite follow that salmon business."

Colin started his yarn, but was only fairly launched into it when they arrived at the wharf. There quite a crowd had gathered to welcome the incoming boat, for a big tuna catch always arouses interest in Avalon, and one of its features is the manner in which it is regarded as a personal triumph for the angler. The promenaders gather to see the prize weighed by the officials of the club, and it is rare that the customary photograph of fish, angler, and gaffer is omitted. As for Colin, he was as proud over the fish he had seen caught as though he had held the rod himself.

"I had thought of going to the other side of the island for black sea-bass to-morrow, Colin," his father said, "and I purposed going with Colonel Roader. I suppose you would like to come instead, and from what I hear I think I'll put off that trip and try tuna again to-morrow. You want to come along?"

"I certainly should, Father," the boy said gratefully, "if it wouldn't be spoiling your fun."

"Not a bit, my boy," was the kindly reply, "I've been looking forward to teaching you something about real fishing. Beside which, I have an idea that you and I will have enough to talk about to keep us going for a good while. I'd like to take you up to the club-house now, but you'll probably want to get back home, and we'll go along together. I can get the boatman to look after notification at the club, and all that sort of thing."

"I'll wait, if you like."

"No; Vincente knows all the ropes as well as I do. I judge from your letters that you've enjoyed running around the way you have?"

"I wish you'd been along, Father," the boy replied. "I've had a bully time. I never expected anything like it when I got aboard the *Gull*."

"I didn't either," said Major Dare dryly; "if I had thought of the possibility of the ship being rammed by a whale, you'd never have put a foot on her deck. But Captain Murchison said that whales were entirely harmless, and so I let you go."

"But, Father, you should have seen the way the old whale charged"—and the lad plunged into the thick of the story. He was fairly out of breath when they reached the little cottage Major Dare had rented for a couple of months, but the boy was by no means out of material, and nothing

short of an absolute command could keep him silent long enough to eat his lunch. In the afternoon he unpacked his trunk, revealing little quaint articles he had picked up on his travels as gifts for the various members of the family. But the excitement of home-coming had tired the boy, and quite early in the evening he found himself getting sleepy, so that not long after his little sister had been snugly tucked up, Colin announced his readiness to go to bed, on the ground that he was to get up early the next day, as he was going tuna-fishing.

The morning broke hot and hazy. The gray-green of the foliage on the mountains had a purple tinge in the early morning light, and the sea took on a mother-of-pearl gleam behind its amethyst, as it reflected the changing hues of the roseate sunrise. Over San Antonio and San Jacinto the sun rose gloriously, and in the freshness of the morning air the giant flying-fish of the Pacific leaped and gleamed across the mirror-smooth sea.

Colin drew a long breath and expanded his lungs to the full, as though he could breathe in the glow of color and the wonder of it all.

"It always feels good to be alive at this hour of the morning!" he said.

His father smiled appreciatively.

"You're generally asleep," he said. "But it's a good thing we did get up in time to-day, for unless my eyes are failing me, I think I can see in the distance the tunas coming in. Say, Vincente, doesn't that look like them over there?"

"Yes, sair, I t'ink dat's a school. I overheard a man on ze pier telling of a beeg one he caught yesterday," said the boatman.

"That was Mr. Retaner," was the answer, "one of the most famous anglers and authorities on fishing in America. That's why I came out this morning; he said he thought the school would arrive soon, and what Retaner doesn't know about fishing isn't worth knowing. He practically created deep-sea angling in America, so that as an industry it is worth millions of dollars annually to the country, and as a sport it has been put in the first rank."

Across the sea of glass with its rose reflections of the sunrise and the deep underglow of richly-colored life beneath the transparent water, there came a quick shiver of ripples. Then half a mile away, but advancing rapidly, appeared a strange turmoil, and in the sunlight, a stretch of sea, acres in extent, was churned into white foam, looking like some fairy ice- or snow-field. Above this, at a height of about ten feet, glittered a palpitating silver canopy, almost blinding in its sparkle and its sheen.

"What is that?" asked Colin, wondering.

"The tuna feeding and coming down the coast," was the reply.

As it drew nearer, Colin saw that the gleaming silver canopy was formed of thousands upon thousands of flying-fish, skimming through the air, dropping to the water every fifty yards or so, then, with a single twist of the screw-like tail, rising in the air for another soaring flight.

Below, from the surface of the water broken to foam by the tumult, would leap those tremendous jumpers of the sea, the tuna, plunging through the living cloud of flying-fish, and dropping to feed upon those which fell stunned under their impetuous charges. Occasionally, but very rarely, a tuna would seize its fish in midair, and it was marvelous to see a fish nearly as large as a man spring like a bolt from a cross-bow out of the sea, often until it was ten feet above the water, then turn and plunge back into the ocean.

"We'd better get out of here, I think," Major Dare said to the boatman; "this is getting to be too much of a good thing."

But, as he said the word, the school of flying-fish swerved right in the direction of the boat, and in a minute the anglers were surrounded. The silent, skimming flight of the long-finned flying-fish, the boiling of the sea, lashed to fury by the pursuing tuna, and these living projectiles, hurled as a silvered bolt into the air, frightened Colin not a little, although he was enjoying the experience thoroughly.

"Look out you don't get struck by a flying-fish," his father called to him, bending low in his seat. Colin, who had not thought of this possibility, followed suit rapidly, because the California flying-fish, unlike his Atlantic cousin, is a fish sometimes eighteen inches long, and he saw that if he were struck by one in the full speed of its skimming flight, he might easily be knocked overboard.

"Can't they see where they are going?" asked the boy.

"They can see well enough," his father answered, "but they have little or no control over their flight. They can't change the direction in which they are going until they touch water again. That's how the tuna catches them, it swims under in a straight line and grabs the fish as it comes down to get impetus for another flight."

"But I thought flying-fish went ever so much higher than that!" said the boy. "I'm sure I've read of their landing on the decks of vessels!"

"They do," was the answer; "they are attracted by the glare of the lights and fall on board. But that is generally on sailing vessels with a low freeboard. You don't often hear of flying-fish falling on the deck of a modern liner, and in the few cases in which they have, it has been because they

happened to come out of the water with a rush against a slant of wind which carried them up twenty or thirty feet. They go with an awful force, and I knew an angler once who was pitched head first overboard by a flying-fish, and was nearly drowned before his boatman could get him aboard. He had been struck square between the shoulders and the blow had stunned him for the moment."

"Suppose a chap got hit by a tuna?" queried the boy.

"That's less likely," the father answered, "because, you see, the tuna comes nearly straight up and down; he leaps, he doesn't skim."

"Zere was one went t'rough a boat last season, Major Dare," the boatman interjected. "It was late in ze year, after you had gone, I t'ink, sair."

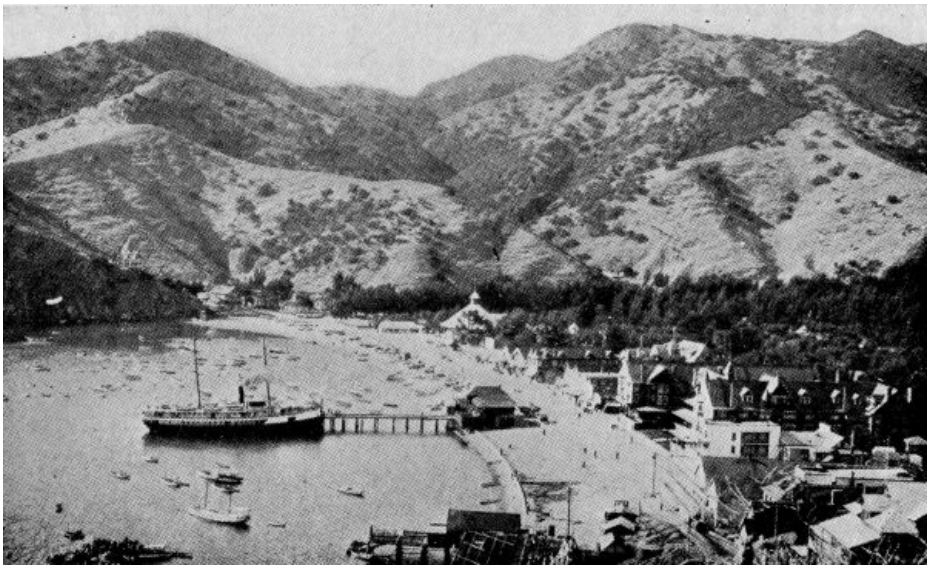
"Had it been hooked?" asked Colin.

"No, sair," the boatman answered; "tuna don't leap after zey are hooked. It was when zey were chasing a school, just like this."

"You're thinking of the tarpon, Colin," his father said; "it leaps wildly after it has been hooked. The tuna, although a wonderful leaper, hardly ever rises from the water after it is fast to the line. But the tarpon is a vicious fighter. A couple of years ago a boat was found drifting in the Galveston fishing-ground off Texas, with a dead angler and a dead tarpon. The fish had been hooked and had tried to leap over the boat, striking the angler and breaking his neck, then had fallen into the boat itself and had not been able to get out."

"There's some excitement to fishing when it's like that!" Colin commented.

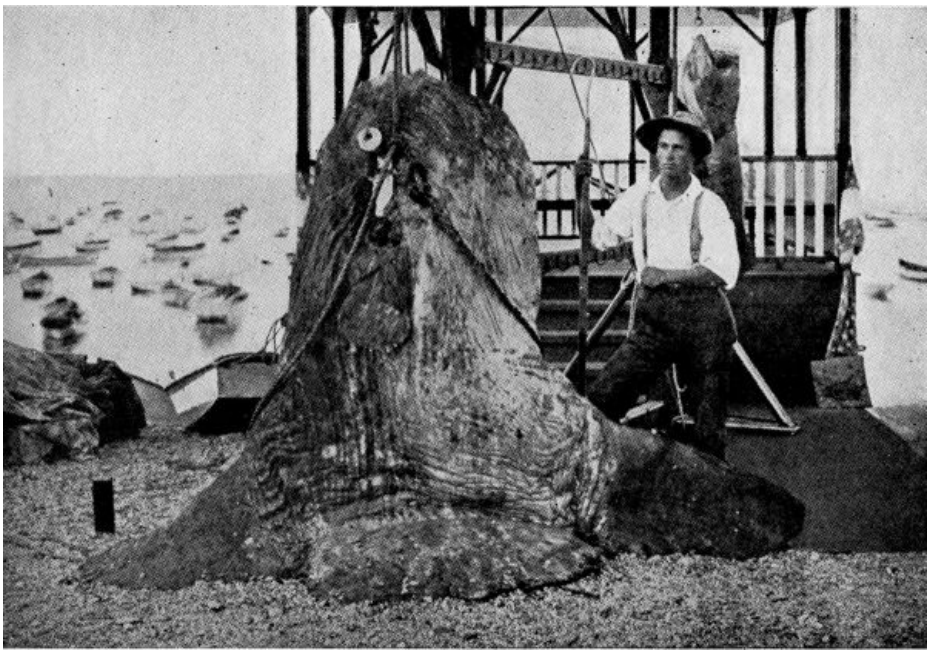
"It's as good as big-game hunting any day, I think," his father answered; "and you don't have to travel for weeks out of civilization to find it. Well, now, we'll give you a chance to show how much of the angler you've got in you."



Where the Big Tuna was Caught.

The Bay and City of Avalon, Santa Catalina Islands, Cal., the most famous sport-fishing centre in the world.

By permission of Mr. Chas. Fredk. Holder.



The Largest Sunfish on Record.

Estimated at over 2500 pounds, caught off Avalon, Santa Catalina.

Courtesy of the U. S. Bureau of Fisheries.

He handed Colin a rod and the boy looked at it. It was nearly seven feet long, and the whole weight of it, except for the short butt which held the reel, was not more than sixteen ounces. The line was thin enough to be threaded through a big darning-needle, it was known as '21 thread' as it had that number of strands, each strand being tested to a breaking strain of two pounds.

"Something will smash, sure," said Colin, examining the outfit carefully; "that looks as though it wouldn't hold a trout!"

"The rod is a split bamboo," his father said, "and if the line breaks it will be because you've allowed the fish to jerk. Anybody can catch fish with a heavy line, but the fish hasn't got any chance, and there's no sport in it. It's on a par with shooting quail sitting instead of flushing them. Good angling consists in landing the heaviest fish with the lightest tackle, not in securing the greatest amount of fish. Why, here in Avalon, there isn't a single boatman who would allow his boat to be used by a 'fish-hog' who wanted to use heavy tackle."

He had hardly finished speaking when there came a quiver on the line, and excitedly Colin jerked up his rod.

"Don't strike with a jerk!" his father cried, but Colin was in fortune, and the line did not break. The reel screamed "z-z-z-ee" with the speed of its revolutions as the tuna sped to the bottom, and the older angler, leaning forward, wetted thoroughly the leather brake that the boy was holding down with his right thumb.

"Easy on the brake," came the warning; "don't put too much strain on the line or she'll snap!"

But Colin had the makings of an angler in him and he was able instinctively to judge the amount of pressure that was needed. The tuna, followed by a sheet of spume-blue water churned by the rapidly-towed line, plunged on and on, until two hundred and fifty feet of line had been run out. Then, from the ice-cold bottom, rising as a meteor darts across the sky, the great fish clove the water to the surface.

"What will I do when he leaps?" asked Colin breathlessly, reeling for dear life as soon as he felt the upward dash of the tuna.

"He won't leap after he's hooked," his father said; "they very seldom do. I told you that before. It's the tarpon that plunges and leaps after being hooked."

The tuna reached the surface with a speed that seemed incredible to the boy, and though he had been reeling as rapidly as he could make his fingers fly, even the big multiplier on the reel had failed to bring in all the slack. The tuna, panic-stricken by the strange line that hissed behind him and which he could neither outrace nor shake off, tried to charge the loops of twine that the reel had not yet been able to bring in. The sea fairly seemed to boil as the fin of the tuna cut through the water at the surface.

"Look out now, Colin," the boy's father called. "He'll see the boat in a minute!"

He did. On the instant he saw the launch and the three men in it, and in the very midst of his charge, the body bent and shot into the depths again.

"Watch out for the jerk!" the older angler cried, and as the fish reached the end of the slack line there was a sudden tug which Colin felt sure meant a lost fish. But his father's warning had come in time, and by releasing the thumb-brake entirely when the tug came, the reel was free, and it rattled out another fifty feet, the boy gradually beginning to apply the pressure again and to feel the tuna at the end of the line.

One hundred, two hundred, three hundred feet of line reeled out at this second great rush, and the older man began to look grave as the big reel grew empty.

"Ought I to try and stop him with the brake, Father?" asked the boy.

"Better not try too hard," came the cautious answer, "the weight of the line that is out is a heavy pull on him. Unless he's a monster he'll have to stop soon."

Fifty feet more of line ran out before the rush stopped, and then a change of action at the other end of the line telegraphed the message to the boy's fingers that the tuna, for the first time in its life, had felt fatigue. From over four hundred feet away Colin felt the call and realized that now he might expect a victory if only he could keep up the fight to the end and never make a slip. One error, he knew, would be fatal; one jerk, and the line would snap, one strain too great, and the strands would give way.

He began to reel in. His back ached and his fingers became cramped, but still he reeled, every fifty feet or so having to let the line run out as the tuna made a rush, so that a quarter of an hour's careful bringing in would be spoiled in thirty seconds. In forty minutes of heartbreaking strain, the boy had gained not more than forty feet of line, but he was game and stuck to it manfully. Reeling in carefully, the fish either sulking or resting, in the next few minutes he won his greatest gain and pulled in until there was not more than one hundred feet of line out. His

heart was beating high with hope, when the tuna sighted the boat again and darted away, apparently as fresh and full of fight as when he had at first been hooked.

At this last rush, when it appeared that there was no immediate slackening of the powers of the splendid fish, Major Dare said:

"Do you want me to finish him for you?"

In his inmost heart Colin feared that he would have to give up, but he did not want to admit it. He was utterly inexperienced in the sport and knew nothing of the many ways whereby older anglers relieve themselves of much of the strain, but the boy's nerve was untouched, and he set his teeth and answered:

"I want to bring him in all by myself, if I can, Father. I'm not done yet, not by a long shot. But if you think I ought to let you finish it, why, I suppose I'll have to."

"No, I want to see you bring him in," his father said; "only don't kill yourself at it. It's just as well not to overstrain yourself; it's easy to have too much energy without judgment."

The boy's grit was soon rewarded, for after this rush, the tuna changed his tactics, and sinking down to about thirty feet from the surface, began a steady powerful swim, not a rush, but a straightaway, having about two hundred feet of line out. To the boy's surprise the boat began to slip along at a fair rate of speed, and he saw that miracle of angling, a hundred-pound fish, frightened and angry, towing a heavy boat with three people in it at a rate of five miles an hour by a line no thicker than a hairpin. With constant watchfulness and deft management, the boy was able to gain a few inches at a time. But a few inches make but little difference when there is two hundred feet of line out!

For over twenty minutes the tuna towed the boat, and then his mood changed. Though not by any means exhausted, the first undaunted freshness had worn off and, sulky and savage, the fish charged back at the line again, that strange white thing in the water that he could not shake off and that followed him no matter where he went. But in charging back at the line, as before, he found the boat at the other end of it. The return charge had been slower than before, and the big multiplier on the reel had done its work, so that when the tuna came near the boat not more than seventy feet of line was out, and the boy determined to hold on to this.

Reaching the surface of the water, the tuna turned. But this time there was no slack and the fish could not begin a rush. He would not plunge in the direction of his captor, and Colin kept a steady strain upon the line, forcing the tuna to swim round and round the boat. This was fatal to the fish, for Colin was able to keep a sidewise drag upon the line, giving the tiring creature no chance to turn its head and dash away.

"You're playing very well!" the boy's father approvingly said, as he saw how, unconsciously, the lad was adopting tricks of angling some experienced fishermen never really learn.

Colin flushed at the praise, and kept closer watch of the constant strain on his line. The boatman, seizing every opportunity, ever and again thrust the boat forward, giving the lad a chance to take in more slack, so that the tuna swam in ever lessening circles. Suddenly he made a sharp flurry and tried to dive. But the line was tight and the brake held him closely, the lifting action curving the giant body in spite of itself and preventing the dive.

The attempt had cost the fish full thirty feet of liberty, and the boat was very near. With a little pumping—that is, raising the rod slowly, then dropping the point quickly and reeling in the foot or so gained, the boy's father showing him how this should be done—Colin brought the fish still nearer. Once more the tuna came up to the surface with a rush in order to get slack enough for a plunge. This might mean that the whole performance would have to be done over again, but again the fish was checked, Colin having the line reeled up almost to the wire leader, and with a quickness that was wonderful in its accuracy, the boatman neatly dropped the gaff under the jaws of the tuna. There was a short, sharp flurry, but Vincente knew every trick of the game and speedily brought the gallant fish on board.

"Two hours an' ten minutes, sair," said the boatman. "An' I t'ink, sair, zat it's over a hundred."

"You did splendidly, Colin," began his father. "Why, what's the matter?" he continued in alarm, as the boy sank back in his seat, looking pale and sick.

"I'm a bit done up, that's all," the boy answered, gasping. His hands were trembling so that he could not hold the rod, and his face was ashen.

"Buck fever, I suppose?"

"Yes, sair; he's all right in a minute," said the boatman. "It does zat every little sometimes, Major Dare. I've seen even ze old angler get very much tired out after ze strain."

"It's the reaction," said Colin's father, as he laved the boy's forehead, and just as Vincente had said, in a moment or two the color came back into the lad's cheeks and he straightened up.

"Silly to act like that," he said. Then, seeing his father's look of concern, he added, "I feel as though I'd like some grub."

Kindly refraining from increasing the boy's embarrassment by commenting on his exhaustion spell, the older man reached for the basket and handed out a package of sandwiches. Two hours

of excitement and exertion in the hot sun, following a very early breakfast, had affected Colin sharply, but boy-like, he was always ready for eating.

"That was what I wanted," he said, as a few bites disposed of the first sandwich and he took another.

The boatman nodded approvingly.

"He's goin' to be fine angler, all right," he said. "Major Dare, if zat tuna's over a hundred, ze boy ought to get ze button. Zat's ze right rod an' line an' it was caught accordin' to ze rules of ze club."

"Could I really get a button?" asked Colin excitedly, the very thought driving away the last remnants of his attack of weakness. "Is it really a tuna? And is it over a hundred pounds?"

"It's a tuna without question," his father answered, "but I'm not so sure about the weight. If Vincente says it is, he's likely to be right."

"Near one hundred and ten, I t'ink," the boatman answered, "an' I'm sure over one hundred. 'Bout one hundred, six or seven, I should t'ink."

"Do you want to put out the line again, Colin?" his father asked.

"Thank you, I've had enough for one day," the boy replied. "Let's see you get one, Father!"

It was a great delight to lie back on the seat with the consciousness of a great feat achieved, to watch the gulls and sea-birds overhead and the flying-fish skimming the rippling sea. Major Dare had excellent sport with a couple of yellowtail—one of which was played fifty minutes and the other thirty-five—but the honors of the day rested with Colin. It was nearly noon as the little launch came up to the pier, and the sun was burning hot, but there were a score of loungers on the beach to welcome them.

"Any luck, Vincente?" called a friendly boatman, as the little craft sped by.

"Good luck," was the reply. "Boy got a hundred-pounder!"

"Did, eh?" exclaimed the other boatman, turning round to stare, and Colin felt that this really was fame. Word was sent to a member of the weighing committee of the club, and in his presence the fish was put on the scales. It proved not to be as large as Vincente had thought, being but one hundred and four pounds, but this was a clear margin over the hundred, and Colin was just as well pleased as if it had been a hundred and forty.

He was eager beyond words to know what would be the verdict of the club, but as the catch had been officially registered, was thoroughly within the rules, and Major Dare was a valued member of the club, it was unanimously agreed that a blue button should be awarded to Colin. He was accordingly elected to junior membership and so received it. The next two weeks passed all too quickly for the boy, for he got the fishing fever in his veins, and if he had not been held in check, he would have stayed on the water night and day. He made a very creditable record, getting a thirty-pound yellow-tail and several good-sized white sea-bass and bonito. But he never even got a bite from one of the big black sea-bass, though his father made a splendid four-hour fight, landing a two-hundred-pounder. The lad's tuna of a hundred and four pounds, also, was far outdone by one his father caught ten days later, which scaled exactly one hundred and seventy pounds.

Three times, in the next two weeks, Colin found himself again fast to a tuna, but was unable to land any of the three. His first he lost by jerking too quickly at the strike. The second walked away with his entire six hundred feet of line at the first rush, and probably was a fish beyond the rod and reel capacity, and the third broke the line suddenly in some unexplained way, possibly, the boatman said, because the tuna had been seized by a shark when down in thirty fathoms of water.

"Does the tuna live on flying-fish only, Vincente?" asked Colin of the boatman, a couple of days before he was going to leave.

"Mos'ly zey do, sair, I t'ink," was the reply, "zat is, when zey can get dem. But zey'll eat nearly any fish an' zey are quite fon' o' squid. Some fishermen use squid for tuna bait, but I don't t'ink much of ze idea."

"Let's see," said the boy thoughtfully, "a squid is something like an octopus, isn't it?"

"Well, no, sair, not exac'ly," the boatman answered. "Bot' of zem have arms wavin' around, but zey look quite diff'rent, I t'ink. An' a squid has ten arms, but an octopus has jus' eight."

"Eight's enough, it seems to me," said Colin. "And are there many of them here? I suppose there must be if they use them for bait."

"Yes, sair, zere is plenty of zem hidin' in ze kelp and ozzer seaweed."

"But how do you catch them?" asked the boy. "Isn't it dangerous?"

"Not a bit, sair," answered the boatman. "I t'ink a squid can't do any harm. In Newfoun'land, so some one tell me, zey run as big as sixty and seventy feet, but in Santa Cat'lina, four or five feet from ze tail to ze end of ze arms is as long a one as I have seen, I t'ink."

"I'd like to go catching squid, just to see how it's done," said the boy. "The squid I've seen on the Atlantic coast don't often grow bigger than twelve inches."

"Catch plenty of zem, any evening you say," the boatman answered; "ze easiest way is to spear zem."

"Bully!" the boy answered; "let's go to-night! I'll get leave, when I go back to lunch."

When Colin proposed a squid-hunt, at first his mother objected, saying she was sure such ugly-looking creatures must be poisonous, but the father knew that this was not the case, and having every confidence in Vincente, who was his regular boatman, he gave the desired permission. Accordingly, after an early supper, Colin started out with Vincente to a section of the shore. The tall, sharp cliffs jutted straight out of the water, and far upon the crest were the characteristic flock of goats browsing along paths impassable to any other animal. Below the water lay the forest of giant kelp.

"We s'all find some squid 'round here," the boatman said; "and sometimes zere are octopus, too, though ze mos' of zem are on ze rocks a little furzer along."

"We'd better get busy, I think," said Colin, "it won't be so very long before it begins to get dark."

"We'll see," was the reply, and picking up his gaffing-hook, Vincente prodded here and there amid the kelp. "T'ought so," he added a minute later, and pointed at the water.

"I don't see anything," said Colin, looking closely. "The water's too muddy."

"No mud," said the boatman, "zat's sepia ink ze squid has squirted so as to hide. Zey always do zat. Zere's probably a lot of zem zere, for zey always keep togezzer."

"Is that the real sepia ink, do you know, Vincente?" the boy asked.

"Ze squid, no; ze octopus, yes. Zere is two or t'ree people here zat catch ze octopus an' sen' ze ink bags to Frisco. See, zere's squid!"

As his eyes became a little accustomed to the reflections in the weed, Colin was able to see ghostlike brown forms that seemed to slide rather than swim through the water.

"Do they swim backwards?" he asked in surprise.

"Always, I t'ink," said the boatman. "Zey take in water at ze gills and zey shoot it out from a pipe near ze mout', an' zat way zey push zemselves along tail first. I'll bring ze boat closer to ze shore for zey'll back away from ze boat an' get into shoal water where we can spear zem."

Moving very slowly and beating the seaweed as they went, little by little the two drove the hosts of squid back through the kelp to a narrow bay, the water being turned to a muddy brownish-black by the discharge of the ink-bags. The squid were of fair size, ranging from one to four feet in length, of which the body was about one-third. Presently Vincente's hand shot back a little and, with a quick throw, he cast the 'grains,' as the small-barbed harpoon was called, into the midst of them. Colin's eyes were not quick enough to see the squid, but the boatman smiled.

"Got him zat time!" he said. "Pull him in."

Without a moment's hesitation Colin grasped the rope that was attached to the small harpoon.

"Don't jerk," the boatman warned him; "ze flesh isn't very tough an' unless you pull steady ze spear will draw right out."

Suddenly Colin felt the rope tauten.

"What's the matter?" he said. "I can't move it."

"Ze squid has got hold of ze bottom," said the boatman with a laugh. "No, you can't move him. Nozzing move a squid, after he's got hold of somet'ing. He'll hang on to ze bottom till ze end of ze world, an' he'd let himself be cut to pieces before he'd let go his hold. Better jerk ze spear out!"

Colin gave a quick yank and the barbed harpoon came up with the blade as clean as though it had never been plunged into anything.

"Zere!" the boatman cried, as Colin stood holding the 'grains,' "one great big one right under you!"

Colin had no time for aim, but seeing a vague shadow below the boat, he allowed for the refraction of the water, and threw the small barbed spear with all his might. His cast was as clean as though he were experienced, and as he grasped the rope he cried to the boatman with a laugh:

"Beginner's luck!"

"Don't let him get to anyt'ing solid," the boatman warned him. "Jus' keep him from zat an' you're all right. Don't play him like a fish. Jus' pull him in."

This was child's play, for the squid's queer method of going through the water offered no resistance and he was pulled up to the boat. But no sooner had the cephalopod come within reach than the tables were turned. With the speed of light the creature swung over, threw two of

its arms under the boat; one clasped the gunwale and others fixed themselves on the boy's bare arms, while two waved freely as though waiting a chance to twine around his neck and strangle him.

Colin yelled with fright. As the cold, clammy suckers crinkled themselves into his flesh, the skin all over his body seemed to creep in disgust. He had been bending over as he hauled up the rope and the squid's tentacles around his arms held him poised half out of the boat, his head not more than a foot and a half from the surface of the water, looking straight into the hypnotic, black, unwinking eyes of the sea-monster.

The instinct of fright arose. Using all his strength, he raised his right arm and grasped the tentacle that had been wound around his left arm. To his surprise he found that a moderate amount of force only was needed to pull the grasp of the tentacle free, and he released himself from the creature almost without difficulty. Nor, except for a slightly reddened spot on his arms, was there any outward evidence of the encounter.

Vincente reached down for the cephalopod, allowing it to wrap some of the tentacles about him, then pried its grasp from the boat with the handle of the gaff. He made no attempt to free himself from the squid, but as he stood still for a minute or two, the creature voluntarily released its hold, falling to the bottom of the boat.

"Zey haven't any strengt' at all out of ze water," the boatman said, "but while swimming zey have a good deal. See, ze whole body of zat squid isn't more zan two feet long, an' yet if he'd got a hold of you in ze water, specially with ze bigger suckers on ze t'ick part of ze arms, you might have had some trouble. Zose big fellows wit' bodies twenty feet long an' arms t'irty feet, mus' be one horrible t'ing to meet on a dark night."

"But would they attack you?"

"Never, I t'ink," said the boatman. "Ze biggest of zem hasn't a beak large enough to take in a herring."

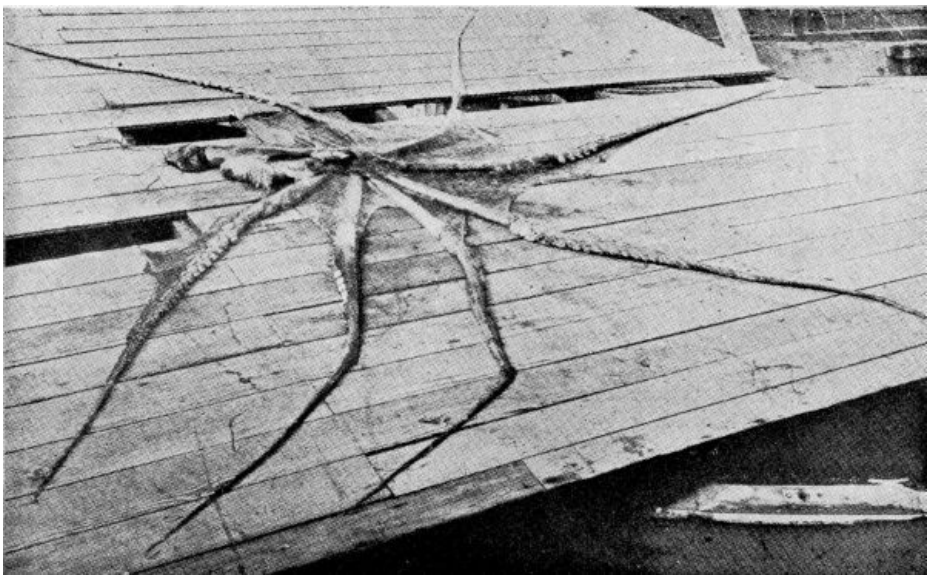
"Well," Colin said, "I suppose that really wasn't as exciting as it seemed, but I tell you, for a while, I felt as if I was having all the thrill I wanted."

"You ought to try ze octopus, now," said the boatman with a chuckle; "zat is, if you've had enough of ze squids. It's early yet an' we might go after some of zose octopuses zat hunt crabs."

"I'm ready," said Colin. "They won't get me by surprise, like that squid did!"

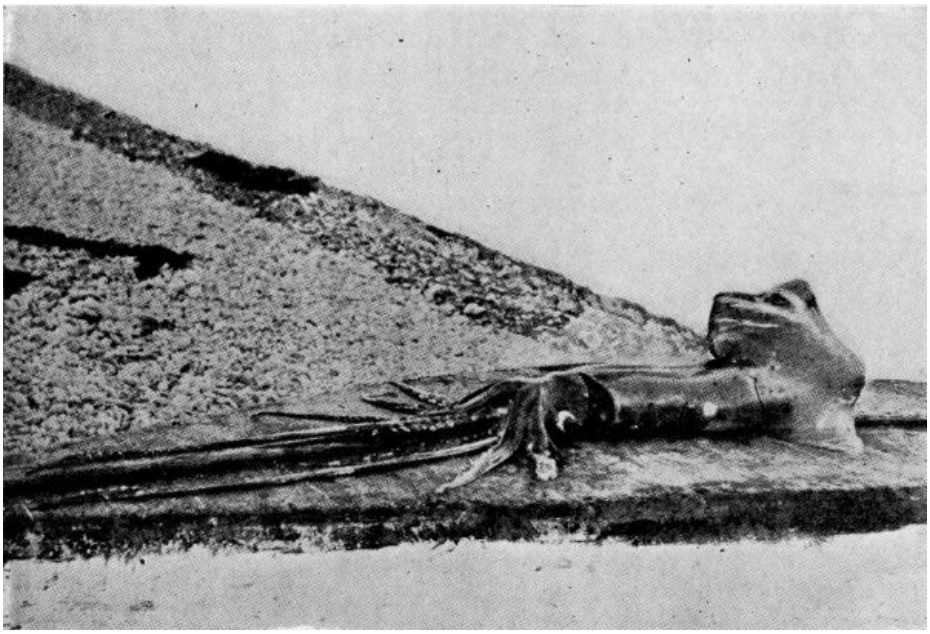
The sun was near the horizon when Colin and the boatman landed on the rocky shore, and the sunset colors were gorgeous. But Colin did not want to run any chances of being caught napping, and he followed Vincente, watching every move. Presently the boatman stopped and pointed, like a dog flushing a covey of partridges.

About eight feet away was a crab of fair size, perhaps six inches across the shell. Half-way between where they stood and the crab, right on the edge of the water, was a small octopus with its large, glaring, green eyes fixed on the crab. This was at first the only sight Colin could get of the creature, but by looking into the water closely, he was able to make out the vague shape of the octopus. The cuttlefish had changed from its natural color to the exact hue of the sandy bottom on which it was crawling, and it was advancing so slowly that its progress could hardly be seen.



Octopus Caught at Santa Catalina, twenty-two feet across.

By permission of Mr. Chas. Fredk. Holder.



Squid Caught at Santa Catalina, 20 feet in length.
(In Newfoundland a species reaches 70 feet.)
By permission of Mr. Chas. Fredk. Holder.

Suddenly, as a wave washed it within a few feet of the crab, two of the tentacles darted out so swiftly that Colin could scarcely follow the move until they were upon the crab, the rest of the body of the octopus flattening itself upon the sand as though to secure a greater purchase. The crab set both its claws into the soft flesh of the tentacles, whereupon, with a series of horrible convulsions, the cuttlefish lumbered entirely out of the sea and, with two or three repulsive and sinuous gyrations, it forced itself bodily over the crab. By this means the outstretched membranes at the base of the tentacles smothered the movements of the prey and prevented escape, while at the same time the mouth and biting beaks were brought into position where they could find a vital part.

"Do you want zat one as a specimen?" asked the boatman.

Colin was conscious inwardly that he would have preferred to have nothing at all to do with the repulsive object, but as he had come out in pursuit of an octopus, he would not, for the world, have shown the white feather before the boatman.

"Yes, unless we find a bigger," he said, with an overdone assumption of ease.

"I t'ink, sair," Vincente responded, "zat we'd better be satisfied wit' zis one. Shall I take it or will you?"

There was just a hint of irony in the boatman's tone, and remembering the timidity he had shown when clutched by the squid, Colin felt that this was the chance to redeem himself.

"I don't mind taking it," he said. "You say these things are quite harmless."

"Quite, sair, I t'ink," the boatman replied.

"All right," was the boy's rejoinder, and he walked forward boldly toward the octopus. The green eyes regarded him steadily, and just as the boy stooped to grasp the slimy body, it seemed to gather itself in a heap and started for the sea.

This was an unexpected move, but Colin, having stated that he wanted that octopus, did not propose to be cheated out of it. He was surprised that the cuttlefish could move so fast, and his repugnance gave way to excitement as he started running after the writhing eight-armed creature. He was just about to grab it when he tripped on a rock, covered with slippery seaweed, and fell headlong, the fall throwing him immediately upon the octopus. For a moment the boy was staggered, and he never knew whether he had grabbed the cephalopod or whether it had grasped him, all he knew was that he was lying on the ground with six of the eight arms of the octopus around him.

The boy was just in time to throw up his hands to protect his eyes, as a torrent of the inky fluid deluged him from head to foot. He struggled to get up, but the two tentacles of the cuttlefish held fast to adjacent rocks, and Colin might have found difficulty in freeing himself, owing to the awkward attitude in which he had been caught, but for Vincente, who wrenched the tentacles away from their hold.

"Are you all right, sair?" the boatman asked.

"All right," said Colin stoutly, as he got up.

Seldom had he been such a sight! He was black from head to foot with the sepia fluid, his clothes were torn where he had fallen on the rocks, and he was smothered in the nauseous embrace of the uncanny and diabolical eight-armed creature clinging to his shoulder. Once, on the way to the

boat, the cuttlefish seemed ready to drop off, but, at Vincente's warning, Colin made believe to force apart the other tentacles, and the octopus renewed its hold. As soon as they reached the boat and the boy stood still a moment, the cuttlefish let go, and fell to the bottom of the boat.

Colin looked down at himself and laughed, then jumped overboard in all his clothes, threshing around in the water to remove as much of the sepia as he could, clambering in when he had washed off the worst of it.

Vincente looked at him.

"I t'ink, sair," he said, smiling, "you ought to be photograph' wit' ze catch!"

CHAPTER VI

DEFEATED BY A SPOTTED MORAY

Colin's brilliant success at Santa Catalina, signalized by his receipt of the tuna button, had so increased Major Dare's pride in him that when the boy renewed his request that he be allowed to enter the Bureau of Fisheries, his appeal received attention. The inspiration that he had gained from the whole-hearted enthusiasm of the professor was evident in all that the boy said, and his father was surprised to find how much the lad really had learned about the work of the Government during his experiences in the Behring Sea and on the Columbia River.

"It doesn't appeal to me particularly," his father said quietly, when the boy closed a somewhat impassioned petition, "but we are each built upon a different pattern. To me, fish are of interest as a food and for sport. I couldn't be satisfied to take them up as a lifework. There's no money in it; of course, you can see that."

"There isn't in any government work, is there?"

"No," was the reply, "big fortunes are always made in individual ways. But when you're starting out in life, it is much more important to be able to do the work you like than it is to seek only for money. The principal thing I'm afraid of is that you will find it tiresome and monotonous after a while. It's very hard work with a good deal of manual labor involved, and there is nothing particularly attractive in a bushel of fish-eggs!"

"But it's only on the start that you have to do the steady grind," Colin objected, "and one has to do that in every line of work. I know you would very much rather I took to farming or lumbering, but I think a fish is a much more interesting thing to work with than a hill of corn or a jack-pine."

"But don't you think you would find it tame after a while?"

Colin leaned forward eagerly.

"I know I wouldn't," he said confidently. "I've heard you say, Father, that everything was interesting if you only went into it deeply enough. Now, there's more chance for real original work with fish than in any other line I've ever heard of. The professor gave me an idea of all the different problems the Bureau was trying to solve, and each of them was more interesting than the last. You've got to be a doctor to study fish diseases, an engineer to devise ways and means for stream conditions, a chemist to work on poisons in the water that comes from factories, and all sorts of other things beside. It looks to me as though it had the best of all the professions boiled down into one!"

"That's an exaggerated statement, of course," was the reply; "but you seem in earnest. No," he continued, as Colin prepared to burst forth again, "you've said enough."

The boy waited anxiously, for he felt that the answer would decide his career.

"If your heart is set on the Fisheries," his father rejoined thoughtfully, after a few minutes' reflection, "I presume it would be unwise to stop you. But remember what I have told you before—I'm perfectly willing to fit you for any profession in life you want to take up, but only for one. If you begin on anything you have got to go through with it. I'll have no quitting. As you know, I would rather you had taken up lumbering, but I don't want to force you into anything, and perhaps your brother Roderick may like the woods. You're sure, however, as to what you want?"

"I want fishes!" said Colin firmly.

"I've been looking up the question a little since you wrote to me from Valdez," Major Dare continued, "because I saw that your old desires had increased instead of dying out. You know, Colin, I want to help you as much as I can. You realize that there's no school of fisheries, like the forestry schools, don't you?"

"Yes, Father."

"And that if you go into the Bureau the only way you can learn is by the actual work, hard work and dirty work, too, it will be often."

"Yes, sir," the boy answered, "I was told that, too."

"I wrote to the Commissioner," said Major Dare, "and explained the whole position to him. He answered my letter in a most friendly way, and showed me just what I've been telling you this morning. He pointed out frankly that the Bureau had so much to do and so little money appropriated to do it on, that such a thing as a 'soft job' wasn't known in the service."

"I'm not looking for that," said Colin, a trifle indignantly.

"I don't think you are, my boy, but you want to be sure before you take the plunge," was the warning answer. "You oughtn't to wait until you are in college before you make up your mind."

Colin looked across the table at his father and met his glance squarely.

"There's nothing else that I want to do," he said firmly, "and I do want that. Of course, I'll do whatever you say, but I feel that the Bureau of Fisheries is where I'm bound to land in the end."

"No going back?"

"No going back, Father!"

Major Dare reached out his hand, and the boy grasped it warmly.

"Very well, my boy, that's a compact. I'm not sure just what will need to be done to enter you in the Bureau, but whatever is necessary, we'll do. I think you have decided on a life that will be hard and sometimes thankless, but at least it is a man's job, and will have its own compensations. You couldn't possibly do anything more useful. We'll go home by way of Washington, visit the Fisheries Bureau together, and see what arrangements we can make."

"That's bully, Father," said Colin earnestly; "thank you ever so much."

"Make good, my boy," his father answered, "that's all you have to do. You'll only have yourself to thank, for it will be all your own fight."

It was fortunate for Colin that this was not decided until the day before they left Santa Catalina, for he became so impatient that the intervening hours before they started for the East seemed like weeks to the boy. His enthusiasm was so genuine that, although his mother was already very tired of the interminable 'angling' conversation in Santa Catalina, she succeeded nobly in evincing an intense interest in the whole fish tribe.

When they arrived in Washington, which chanced to be in the afternoon, Colin wanted to start off for the Bureau of Fisheries immediately, even before he went to the hotel, and he seemed to feel quite aggrieved when the visit was put off. Major Dare had some important business to look after and he purposed to leave the question of the boy's arrangements open for a couple of days, but he saw there would be no peace for any one until Colin's fate was settled, and at the boy's importunity he 'phoned to the Bureau and made an appointment with the Commissioner for the following day.

Next morning, accordingly, the two started off together for the Fisheries Building, an antiquated structure standing in the magnificent park behind the National Museum and but a short distance from the Smithsonian Institution. They entered on the ground-floor, seeing to the left a number of hatching troughs, to the right models of nets and fishing-vessels, at the far end a small aquarium, while in the center was a tank in which were the two fur seals that the boy had heard about in the Pribilof Islands.

He pulled his father's arm.

"Oh, Father!" he cried; "there are the fur seals. Come over and see them!"

But his father shook his head smilingly.

"They are not personal friends of mine, as they seem to be of yours," he said, "and I have no time to waste. Besides, we have an engagement with the Commissioner. You can come down and chat with your seal acquaintances after our talk."

The Commissioner greeted them cordially, and without waste of words.

"So this is the boy!" he said, after the customary greetings. "He'll need to grow a bit, eh?"

"So did both of us once," said Major Dare, looking at his own height and the Commissioner's burly frame. "We haven't done so badly."

"That's true. Well, boy, tell me just what you want to do."

"Everything that there is to do in the Bureau, Mr. Glades," answered Colin promptly.

The Commissioner rubbed his hand over his chin, with a short laugh.

"That's a big order," he said. "Willing to work?"

"Yes, sir," the boy replied; "I don't mind work."

"This is the place for it. There's just two kinds of people in the world," the Commissioner went on; "those who do just what they learn to do and nothing else, and those who do the work because they want to."

"Yes, sir," again responded the boy, wondering what was coming.

"The first lot keep things running and that's all. The others are the real men. The last are the men we've got in the Bureau and everybody has to be up to the standard. So, there you are."

"I don't know whether I can come up to the standard, but I'm one of those that want to!" the boy said emphatically, rightly judging that the Commissioner was not the sort of man who liked long speeches.

Headquarters of the U. S. Fisheries Bureau, at Washington, D. C.

Courtesy of the U. S. Bureau of Fisheries.

Hauling the Largest Shad Seine in the World.

Spawn-taking operations on the Potomac River. Trying to save from extinction one of America's finest-flavored food fishes.

Courtesy of the U. S. Bureau of Fisheries.

"Good! Going to college?"

The boy looked at his father.

"I had thought of sending him to Brown," he said, "since he got this Fisheries idea. One of my friends told me that it was an excellent university for biology."

"Do it!" said the Commissioner. "Send him to college in the winter, let him work with us in the vacation. That'll give him four summers' training with us. When he comes out of college he ought to be worth something to the Bureau. But don't start and then give up."

"Colin won't do that," his father said, then added pointedly, "I'll see to it that he doesn't."

"Very well," said the Commissioner, "that's settled." He rang a bell, and a messenger appeared at the door. "Ask Dr. Crafts to step here a minute if he is disengaged. Dr. Crafts," he continued, turning to Major Dare, "is perhaps one of the most valuable men we have on the Bureau. Oh, by

the way, boy, when do you want to start?"

"Right away, sir, if possible," Colin replied.

"Is that novelty or enthusiasm?"

"Enthusiasm, I think," Major Dare answered, smiling.

In a moment the door opened again, and the Deputy Commissioner came in.

"Dr. Crafts," the Commissioner said, after introductions had been made, "here's an enthusiastic youngster who wants the Commissionership! Not right away, perhaps," he added as the newcomer smiled at the boy, "but perhaps in a couple of decades or so. And he thinks he ought to start this minute. Have we anything for him to do?"

"I don't know of anything especially," said the Deputy Commissioner thoughtfully; "it's so late in the season."

"Let him have something to work off his animal spirits," the Commissioner said; "it's a pity to let so much energy go to waste."

"Very well," the other said genially; "we'll see what we can do. Will you join us, Major Dare?"

"I think not," the boy's father answered; "I will leave him entirely in your hands, and he can tell me all about it afterwards. I want just a word or two more, Commissioner," he added, "and then I must be going."

"What's your name, lad?" asked his new chief, as they walked along the hall.

"Colin Dare, sir," the boy responded.

"Which is it to be," the official asked with a pleasant smile, "'Colin' or 'Dare'?"

The boy looked up at him and felt instantly the thorough kindliness and fine worth of his companion, and answered promptly:

"'Colin,' sir, if you don't mind. That is, at least, to you."

"All right, Colin," was the reply; "I suppose we must see what we can find for you to do. Tell me," he continued, as they entered his office, "how you came to think of entering the Fisheries Bureau?"

Thus adjured, Colin told briefly how his father had tried to interest him first in lumbering and then in engineering, but that neither had appealed to him. Then he told of his whaling adventures and of the few days he had spent on the Pribilof Islands, recounting the Japanese raid with great gusto. The Deputy Commissioner, who had heard nothing but the official account of the fracas was intensely interested and he questioned Colin closely, noting carefully the boy's clear understanding of the seal question.

"You have a head for facts, Colin," he said approvingly, when the whole adventure had been told, "because you really have noted the important points in that sealing business, and it is more complicated than it looks. Go on, now, and tell me how you came down from Valdez."

So Colin took up the story again, described his meeting with the lieutenant of the revenue cutter and the kindness he had received from him. The Deputy Commissioner smiled, for the officer in question was a close personal friend. Then Colin told of the salmon tagging and of his visit to the hatchery, not forgetting the capture of the sea-serpent.

"It seems to me," Dr. Crafts said jokingly, "that you have become a public personage in connection with Fisheries even before you come into the Bureau. To figure in a Japanese seal raid and to capture a sea-serpent in the same summer is enough fame for anybody!"

Colin laughed and answered:

"After that it would seem a little like boasting, but——" he reached into his pocket and pulled out the tuna button, safely stowed away in a tightly-closed box.

The Deputy Commissioner whistled softly in surprise.

"And did you win this, too?" he asked. "You went to Santa Catalina, then?"

"Yes, Dr. Crafts," the boy replied, and related his experiences while there. He told the story well, and the Deputy Commissioner—who was a master in that art—nodded appreciatively.

"So far as I can judge," he said, "the Bureau is the place for you. But I don't know where to fit you in. It is getting on towards the middle of August, and not only is the work all arranged for the summer, but most of it is done."

"I just want to be at work," pleaded the boy, "for the experience, not for what I can get out of it, of course."

"That sort of arrangement is impossible," answered the Deputy Commissioner; "there is plenty of volunteer work done in the Bureau, but such work is always along the line of special investigation, and it is given to those who are equipped for research, usually university professors. The assistants are always paid, and you see I couldn't very well create a precedent on

your account!"

"No, Dr. Crafts," answered Colin, quite disheartened; "I suppose not."

The Deputy Commissioner tapped on the desk thoughtfully.

"It happens," he said, "that a friend of mine who is attached to the American Museum of Natural History—that's the New York museum, you know—sails for Bermuda next Saturday to get some material. He wants to take a helper along, and the Museum provides him with funds for engaging help on the island."

"Yes, sir," the boy said, wondering what was coming.

"Now," the Fisheries official continued, "if he has got to have help it might be a good experience for you to go with him, but you may have to pay your way across. What salary you receive over there would just about meet the expenses of the trip, so that you would break even. Would you like to do it?"

"I'd rather start in on the Bureau," Colin answered, but he was wise enough not to refuse an opportunity, and continued, "but if you think it would be a good thing for me to do, why, of course, I'm ready."

"I think it would be an excellent chance," the Deputy Commissioner said, "because we do very little work around the Bahamas, and none at all in Bermuda, so that it would give you an idea of the fish-life there which, otherwise, you might never get. And if you tried any Bureau work now, you would be handicapped by not having started with the other boys, and you'd be so far behind that you might feel badly about it. So the Bermuda opportunity seems to me the best chance."

"What is the purpose of the trip, sir?" asked the boy.

"To prepare a model for the Museum which will give people an idea of the sea-gardens as they really are. Part of the model will be of prepared specimens, I believe, and some will be copies made of spun glass. I understand that Mr. Collier wants to study especially the sea anemones, the corals, the sponges, and the sea-fans; also, to note the habits of the fish peculiar to the coral reefs, and show them in the model as though they were swimming about in their natural habitat."

"That would be awfully interesting!" said Colin.

"It will teach you a lot," rejoined the Deputy Commissioner, "and you can't ever know too much about sea-life. The real backboned fishes, with which the Bureau principally deals, are only a small part of the population of the ocean."

"Shall I go and call on this gentleman, then, Dr. Crafts?" the boy asked.

"You had better drop in and see me this afternoon," was the reply. "I'll telephone to Mr. Collier and ask him to take lunch with me and we'll talk it over then. Suppose you come in about half-past two o'clock, and if he takes kindly to the scheme I'll have him meet you here. If he has other plans, why, there's no harm done, and we'll try and think of something else."

Thanking his new-found friend heartily, but not quite sure whether he liked this way of shelving him from the Bureau for a season, Colin made his way to the lower story of the building, where he felt that the two young fur seals were old friends. As it happened, a couple of boys about his own age came along and, overhearing their remarks, Colin joined in, realizing that they had all sorts of wrong ideas about the seals. He waxed so enthusiastic that, as other people came in, they gathered around him and, before Colin was really conscious of it, he had quite an audience. Among them was an old attendant of the Bureau who, as it happened, had been on the Pribilof Islands with Dr. Brown Goode, in 1872. He listened for a while, then said:

"I beg your pardon, sir, but have you been in St. Paul recently?"

"I was there this spring," Colin replied.

"It's just forty years this summer, sir, since I was on the islands. They tell me there's been great changes." And, without further ado, he commenced to question Colin closely concerning the place, the boy having equal interest in learning what the rookeries were like when the first investigation was made. It was not until lunch-time that he could tear himself away.

Promptly, at the hour appointed, Colin presented himself at the Deputy Commissioner's office and was met by Dr. Crafts' secretary. His pulse was beating like a trip-hammer, and he probably looked nervous, for the secretary glanced once or twice in his direction. Then, wishing to give news that would be welcome, she said formally, of course, but betraying a sincere kindliness:

"I think Mr. Collier is with Dr. Crafts now."

On the instant Colin detected that the secretary knew something about the matter and wanted to reassure him, so he smiled back, saying:

"Thank you. I hope it will be all right, then."

The two men were chatting earnestly, and the wait seemed long to Colin, but after a while the Deputy Commissioner called him in.

"This is the boy, Robert," he said. "Colin," he continued, "let me present you to Mr. Collier."

"So you're coming along with me to Bermuda and Florida, I hear," the museum curator said, shaking hands.

Colin looked up at the tall, gaunt figure and caught a twinkle of good-humor in the deeply-sunk gray eyes.

"I was hoping to before, sir," he answered, "and I'm hoping to, even more now."

"That's the way to talk, never lose a chance for a happy phrase," was the reply. "Well, Dr. Crafts here seems willing to go bail for you—although I understand he never saw you before to-day—and I think we could get along all right, so if you're satisfied, I guess we'll call it a deal. There's one difficulty, though."

"What's that, sir?" asked the boy.

"I shall probably need to go to Florida as well, and I should like to have my assistant stay with me clear through."

"So much the better," the boy responded.

"But I understand you're going to start your freshman year in college?"

"Yes, sir," the boy answered, "I'm going to Brown."

"That's what I thought. But you see I don't expect to get back much before the tenth of October, and college will have started by then. I don't want," he continued, his eyes twinkling with fun, "to rob the other fellows of the fun of hazing you."

"I don't think there's much hazing at Brown, sir, and perhaps I shall miss some of the fun of the opening of the year," Colin replied, after thinking for a minute or two; "but I'd much rather take the trip with you, sir, and I can soon catch up with my class in any subject the first few lectures of which I may have missed."

"But aren't you supposed to be in attendance on a certain day?"

"Yes, Mr. Collier," the boy replied, "I believe I should be. But Father can fix that all right."

"You think your father can arrange anything, Colin," said the Deputy Commissioner, smiling.

"Well, he always has!" the boy declared.

"If the Florida trip is no barrier," the curator said, "I think that we can call the matter settled. Dr. Crafts told you that you would have to pay your own passage?"

"Yes, sir."

"You'll like Bermuda, I think. Everything there's so much worth while."

"There you go again, Robert," said the Deputy Commissioner; "always in superlatives."

"Of course! Who would want to be otherwise?" said the curator. He turned to Colin. "Come and take dinner with me to-night, and we'll talk over the details. Here's my card," and he penciled his address on the pasteboard. "I'll give you some seaweed pudding, carrageen, you know."

Colin didn't know, but he thanked his host heartily, and then turned to the Deputy Commissioner.

"What is it, Colin?" he was asked.

"Please, sir," the boy replied, "you haven't said anything about my chances in the Bureau."

The Fisheries official looked straight at him with a long, level glance.

"We need high-grade, well-trained men," he said; "the more so because there are no really good ichthyological schools. And no matter how well-trained a man may be he's got to have the practical experience and the grit behind it. If you show in this trip that you're made of the right kind of stuff and if your college work is up to standard, I'll promise you a summer job for next year and for each year that you're at college. You'll be advanced just exactly as fast as you deserve, and not a bit faster. If you want to go into the Bureau your record will be watched, and you'll sink or swim by that!"

"Very well, sir," said Colin, a little taken aback by this straight-from-the-shoulder statement. "I'll do my best, anyhow." He shook hands heartily, and thanking his new chief, hurried excitedly to the hotel where his family was staying to tell of his success and of the unexpected addition of the Florida trip.

His father was quite well satisfied that the boy should have so pleasant an initiation into the life he had chosen, and was quite content that this semi-holiday opportunity had arisen instead of hard work in one of the hatchery stations. Major Dare felt that Colin had already had a strenuous summer and that it was advisable for him to do something a little less adventurous before beginning his college work.

The evening that the lad spent with the scientist-artist was a revelation to him, for his host not only knew the life of the bottom of the sea as though he had always lived there, but he was a marvelous designer in glass, and possessed some of the most exquisite models of fragile sea forms, all of which had been made under his direction. Several of these were magnified many

times and were more beautiful even than any the boy had ever seen pictured.

There were no half-way measures in Colin's enthusiasm, and he begged Mr. Collier to lend him books, so that during the days that were to elapse before starting on the trip, he could get an idea of the life histories of sea anemones, jellyfish, and the like, with which he would be working. His friend was both amused and pleased by the lad's eagerness.

Mrs. Dare had visited friends in the Bermudas once or twice, so that she was able to give Colin many suggestions which he found went far to increase the pleasure of his stay. A meeting was arranged, and Major Dare liked his son's new friend immensely, quite a pleasant relationship being established between the two men, so that Colin's departure for Bermuda was under the happiest auspices. He soon learned that the museum curator was not only an authority on his own subject of marine invertebrates, but that he was interested to the utmost in all sorts of affairs, and he admitted confidentially to the boy that he was an inveterate baseball fan. Best of all, perhaps, Colin gained from him the feeling that science and scholarship were two windows whereby one might see how much good there is in the world.

"Enthusiasm," Mr. Collier said, "is one of the best forces I know. A boy without enthusiasm is like a firecracker without a fuse. The powder may be there all right, but it will never have a chance to make itself heard."

The lesser-known life of the sea, in which the boy's interest was centered for the especial purposes of this trip, seemed to Colin at first even more interesting than that of fishes and the voyage to Bermuda was practically a continuous revelation of wonders. The scientist realized that he had not only an assistant, but a disciple, and went to much trouble to teach the lad. This was one of Colin's great characteristics, his interest was always so genuine and so thorough that others would do everything they could to help him.

The Bermuda Islands were sighted for the first time under a cloudy sky, and Colin thought he had never seen a more disappointing sight. Compared to Santa Catalina, the islands lay low and without sharp contrast, no cliffs rising bluff upon the shore, no mountains looming purple in the distance. The land was parched—for it was late in the summer—and the scattered foliage looked small and spindling after the gigantic forests of California. The "beautiful Bermudas" seemed plain and uninviting as the steamer passed St. David's Head. Moreover, as they steamed down along the north shore, the same appearance was visible throughout, its low undulating sea-front of black, honeycombed rock lacking character, the rare patches of sandy beach and sparse sunburned vegetation seeming bare and dreary.

Reaching Grassy Bay, however, past the navy yard and rounding Hog-fish Beacon, the sun came out and swiftly the scene became transfigured. As the steamer drew nearer and began to run between the islands in the channel, the undulating shores showed themselves as hills and valleys in miniature. The bare, white spots were revealed as white coral houses set in masses of flowers, the foliage—sheltered from the north—gleamed dark and luxuriant, while the shallowing crystal water glinted from the white sand below as though the steamer were sailing through a translucent gem. Before the vessel had passed the length of the Great Sound and had warped into Hamilton, Colin had changed his mind, and was willing to admit that, after all, Bermuda might be quite a pretty place.

But he could not have believed the transformation scene through which he seemed to pass on landing. Freed from the glare of the waterfront of Hamilton and on the road to Fairyland Bay, he seemed to have entered a new world. It was a Paradise of Flowers, even the Golden State could not outdo it. Hedges of scarlet hibiscus flamed ten feet high, clusters of purple bougainvillea poured down from cottage-porches, while oleander in radiant bloom formed a hedge twenty feet high for as much as half a mile at a stretch. At one moment the road would pass a dense banana plantation with the strange tall poles of the pawpaw trees standing sentinel, the next it would pass the dark recesses of a mangrove bay, where the sea ebbs and flows amid an impenetrable thicket of interlacing roots. And at frequent intervals a slight rise of ground would show the emerald sea beyond, gleaming as though lit with living light.

"'The land where it is always afternoon,'" quoted Mr. Collier softly, as they drove up to the house where they were to stay, a small hotel overlooking a narrow fiord of rock, into which the translucent water rippled. Beyond, upon the gleaming bay rested three or four tiny islands.

"It's almost the loveliest place I ever saw," said Colin; "but it isn't as grand and wild as Santa Catalina."

"I never want to leave Bermuda," said the other; "every time I visit the islands I decide that some day I must come and live here. And even when I am away, its memories haunt me. Everything seems so much worth while here."

"What's the programme, Mr. Collier?" asked Colin, after lunch, when they were comfortably settled.

"You are at liberty this afternoon," was the reply, "as I have a number of small things to look after, so that if you want to get a glimpse of the islands, you had better make good use of your time. You ride a wheel, of course?"

"Oh, yes."

"Then walk into Hamilton and rent one; bicycling is the only way to see Bermuda properly. And

you'd better go to Devil's Hole this afternoon and see the fish there. Try and persuade the old keeper of the place to talk, and if you can get him started, he will tell you a good deal about Bermuda fishes. They're worth knowing about, too!"

Acting on this advice, Colin strolled into the little city and rented a bicycle. The roads, he found, were perfect for wheeling, there being only one hill too steep for riding, but in spite of all that he had heard about the absence of distances, it seemed incredible that an hour's easy wheeling should enable him to cover almost half the entire length of the main island. Everything was in miniature, and having a camera with him, he took snapshots recklessly everywhere, each turn in the road seeming to give a picture more attractive than the last. He was to find, however, that the charm of Bermuda is too subtle for the photographic plate.

On the way to Devil's Hole, taking the south-shore road, Colin had an opportunity of noticing its amazing contrast to the north shore, which had seemed so desolate and uninviting as the steamer came in. The conformation was widely different, marked by higher cliffs, rocks jutting out boldly into the sea, with the waves boiling over them and throwing up the spray, wide stretches of fine white sand, and as far as the eye could see, small circular atolls of coral level with the surface of the water. He paused for a little while at the house where the Irish poet, Thomas Moore, once dwelt while a government employee on the island, and—like every visitor—he sat for a while under the famous Calabash Tree, renowned in verse. Nor did he fail to visit the marvelous stalactite caves of which Bermuda has five beautiful examples, lighted with electricity to display their wonders. The boy was greatly interested in the most recently discovered one of all, where the stalactites branch like trees in a manner but little understood by geologists. But, greatly though he wished to investigate this problem, Colin's objective point was the Devil's Hole; and fish, not stalactites, were his first consideration.

Devil's Hole was a strange place. Lying inland, a little distance from Harrington Sound, and with no visible connection with the sea, it seemed a creation of its own. It was a pool, sunk in a bower of trees, almost exactly circular and over sixty feet deep. Silent and reflecting every detail of trees and sky above, the dark water was filled with fishes of many varieties, nearly a thousand fish living near the surface or in its depths. Underground channels connected it with the Sound, that great inland sea of Bermuda, and the water in the pool ebbed and flowed with the tide, changing in level, however, but a couple of inches. A tiny bridge spanned the water.

The old keeper of the place greeted Colin and proceeded to deliver himself of a humorous rigmarole, designed for the benefit of tourists. It was pure 'nature-faking,' since it ascribed human characteristics to some of the fish in the pool, the various specimens being called the "bride" and "groom" and so forth. The screed was rather wearisome to Colin, but when he tried to interrupt, the old keeper seemed so hurt and so confused that the boy let him go on to the end.

The feeding of the fish was a matter of more interest, and it was striking to observe that the angel-fish and groupers were able to recognize their respective summons to food, for when the keeper tapped one portion of the bridge it gave a sharp cracking sound to which the angel-fish came flocking, while in calling the groupers and other fish, he hit another portion of the bridge, which reverberated in a different tone, and the larger fish dashed through the water to the appointed places. After this performance was over the keeper was willing to talk less idly, and showed a very considerable knowledge of the species found in Bermuda waters.

"I noticed," Colin said, "that you fed the angel-fish with sea-urchin. I don't see how they can eat it with their tiny mouths, I should think the spines would get in the way."

"I crushes the spines before I throws 'em in," the keeper answered; "but they eats 'em in the nateral state. I don't know how they gets at 'em. They has lots of savvy, sir, angel-fish has, and for a small fish they can 'old their own. Why, even the big groupers lets 'em alone."

"Are the groupers fierce?" the boy asked, with his arms on the rail, looking over at the fish.

"Fierce enough, sir," said the old man. "I was tellin' a party once, just what I was tellin' you a while ago about the fish——"

"Yes," said Colin wearily, realizing that the same nonsense about the bride fish and the bridegroom fish and the "old bachelor" and all the rest of it had probably been given as a dose to every visitor for twenty years back, "and what then?"

The Pool where the Dog was Devoured.
Angel-fish and groupers in the Devil's Hole, Bermuda.
Photographed looking down in the water from the bridge.
Note the reflection of the trees on the water.
Photograph by F. R-W.

"There was an officer in the party, sir," the keeper continued, "and when I spoke of the fish as bein' savage 'e laughed and said 'e didn't believe it. 'E said 'e'd swam around among sharks and never got hurt, but I told 'im 'e wouldn't be willin' to take a plunge in the pool."

Colin looked down at the fish.

"They don't look very bad," he said; "but I don't think I'd like to chance it."

"You're right, sir; I wouldn't go in, not for a thousand pound. Well, this officer—'e was a captain, I think—made some remark about it all bein' nonsense, and said that even 'is dog would scare the fish so that they wouldn't as much as come up from the bottom."

"That sounds reasonable enough," said Colin; "a fish wouldn't try to attack a dog."

"That's what 'e said," the keeper continued; "and 'e bet me a 'arf sovereign on it. I didn't want to see the dog 'urt, but a bet's a bet, and there weren't no ladies present, so I took 'im up."

"Well?" queried Colin, as the keeper stopped.

"'E threw the dog in," the keeper answered; "it was a spaniel and quite at 'ome in the water."

"What happened?"

"In about ten seconds the water was just alive with fish, swimmin' round and round, comin' up by the 'undred from the deep water. Then they all turned black, like they do always before they're goin' to feed. Remember, I showed you that."

"Yes, I know; but go on."

"Then they all at once made a dash for the poor beast. I tried to pull 'im out, but there was a couple of 'undred of 'em there, and 'e 'ad no chance. 'E gave just one yelp and then was pulled

under, and the groupers jolly well ate him clear down to the bones. We never saw 'ide nor 'air of 'im agen!"

Colin shuddered a little as he looked at the groupers swimming idly about and said:

"Don't you suppose it was just because there were so many of them in this small pool? I hardly think a grouper would attack anything as large as a dog out in the open sea. They're much the same sort of fish as bass, you know."

"No, sir," the keeper answered; "I never 'eard of a grouper bein' dangerous out at sea. But there is a fish that's very bad around the coral on the reef."

"You mean sharks?" Colin queried.

"No, sir," the keeper answered; "sharks ain't no fish."

Colin elevated his eyebrows a little at this somewhat surprising way of stating that the sharks belonged to a lower order of marine species than any other fish, but he let it pass unchallenged.

"What fish do you mean, then?" asked the boy.

"Not sharks," the keeper replied; "there ain't no sharks near Bermuda anyway, they can't get near enough. The reefs run ten mile out and they never come away inside 'ere. No, sir, it's the moray I'm talkin' of."

"The moray?" echoed Colin thoughtfully. "Seems to me I've heard about that fish somewhere. Isn't it green? It's called the green moray?"

"Yes, sir; that's the fish. But there's more spotted morays around than green ones."

"But that's hardly more a fish than a shark is," objected Colin. "Isn't a moray a kind of eel?"

"Yes, sir, but an eel's a fish. Leastways so I was always told, when I used to work over at the Aquarium on Agar's Island."

"All right," said Colin good-humoredly, "I guess you're in the right about it. Go ahead and tell me about the moray."

"I was just sayin', sir, that they were the only ugly things around Bermuda. And they stay quite a bit from shore out around the coral atolls. You see lots of 'em around the sea-gardens. They 'ides in 'oles of the rocks and strikes out at other fishes like a snake. I knew a diver once, who was goin' down after specimens from one of the sea-garden boats, and was nearly drowned."

"How?" queried Colin a little incredulously. "The moray couldn't bite through the diving-bell."

"No, sir,—no, sir,—not through the diving-bell. But the india-rubber tube that put air into the 'elmet came swingin' past a 'ole in a rock in which a six-foot moray was waitin' for anything that might come along, and 'e darted out at it."

"Did he bite it through?" cried Colin.

"No, sir; a moray's teeth ain't set that way. 'Is teeth set backwards so they 'old anything solid. 'E started to swallow the tube, the moray did, and jerked the diver on 'is back so that 'e couldn't pull the signal-cord. 'E would have been drowned sure, for 'e was forty feet down, but the water was so clear that some one on board the boat saw the fish attack 'im, and they pulled 'im up."

"How about the moray?"

"'E was 'angin' on," was the reply; "'e wouldn't let go, and by the time they 'ad the diver on board agen, the fish 'ad chewed up the air-tube pretty well. But that wasn't the worst, sir," said the talkative old man, growing garrulous, as he saw the boy look at his watch. "Did you ever 'ear 'ow a big moray 'ad a fight with two men, one of 'em a fisherman from New York, and jolly well beat 'em both?"

"No," Colin answered; "how could that be?"

"I didn't see it myself," the keeper began, "but from all I 'ear the story's straight enough. The fishin' party 'ad gone out on the reefs after rockfish, which is one of the gamiest fighters we 'ave 'ere, and some of 'em runs up to fifty and sixty pounds. They 'ad 'ooked several fine 'ogfish—you want to 'ave a look at some of 'em; crimson fish they are with long sweepin' spines—and the next bite turned out to be a chub. They could see 'im plainly enough through the clear water. When pretty nigh the surface, just near'a large dome of brain coral, a long spotted fish shot out and seized the chub, swallowin' the 'ook into the bargain."

"Did they have a strong line?" Colin asked. "A moray is a powerful fish, isn't he?"

"'E's all muscle and teeth," the keeper answered. "Yes, sir, it was 'andline fishin' and they 'ad a good strong line, so it was a sure thing that they could land 'im if 'e didn't wrap the line around a rock. Israel, the boatman, wanted to cut the line, but the New Yorker 'e said, no; 'ad never caught a moray before and 'e 'oped to get this one. So they got the boat out into deeper water, Israel keepin' it clear of the reefs and the fisherman tryin' to 'aul in the line."

"It must have been good fun!" exclaimed Colin. "I wish I'd been there!"

"Just you wait till you've 'eard what 'appened, young sir," the old man warned him, "and then p'r'aps you'll be glad you weren't."

"All right," the boy prompted him; "go ahead."

"'E was plucky, though, this chap, so Israel told me, for while 'is 'and was cut with the line two or three times when the moray made a vicious rush, still 'e 'ung on and that's not as easy as it sounds. But in about 'alf an hour the fish was seemin'ly done for and the New Yorker pulled 'im in, 'and over 'and, as easy as you please. Just as 'e got 'im to the gunwale, though, the moray gave an extra wriggle, and bein' afraid that 'e might get away agen, the fisherman gave a sudden pull and brought 'im on board without waitin' to stun 'im."

Colin grinned appreciatively.

"I've heard of a chap who got into trouble with a conger eel that way," he said. "But go ahead with the story."

"For about a minute or two, so Israel told me," the old man went on, "the moray stayed quiet at the bottom of the boat. Then 'e put up 'is 'ead, with its gleamin', wicked teeth, and looked first at Israel and then at the New Yorker. 'E next sort of shook 'imself all along the spine, to make sure 'e was all there, and began to squirm 'is way toward the stern."

"That was where the angler was?" queried Colin.

"Yes, sir; Israel was in the bow. 'E said the New Yorker didn't seem to take it in at first, but that 'e suddenly gave a yell, jumped on one of the thwarts, and grabbed the boat-'ook. The fish was an ugly-lookin' brute, from what I 'ear, and a spotted moray over six feet long is as nasty a thing to face as anything I know of."

"But he didn't deliberately attack the men, did he?"

"That's just what 'e did! There wasn't no threshin' around and flurryin', but the vicious brute acted just like some kind of a sea-snake. The fisherman brought down the boat-'ook with all 'is might, but the moray just twisted sidewise as the blow came down, and the blunt-pointed 'ead, with its rows of sharp teeth, darted forward for the New Yorker's leg.

"This was too much for 'is nerves and, with a 'owl that could have been 'eard a mile away, the fisherman jumped from the dingey into the sea, the teeth of the moray closin' on the thwart where the man's foot 'ad been a minute before. There was a sound of splinterin', and the eel bit an inch of wood clear out of the board."

"My word, there must have been power behind that jaw!" ejaculated Colin.

"For a minute or two the moray was quiet, and then 'e turned round. But in turnin' 'e got imself twisted, the line which was still fast to 'is lower jaw becomin' entangled around one of the rowlocks. But this gave 'im 'is chance: with a sudden pull, 'e broke the line and was free. Then, so Israel says, the fish just looked at 'im, and began to slide along the boat. But Israel didn't wait to find out what the moray was after, 'e just decided to take no chances, and jumped for the mast."

"Why for the mast?" queried Colin. "He couldn't hang on there very long."

"No," the old keeper answered; "but supposin' he went overboard with the New Yorker, what could they do with the boat? Ask the moray to sail it into 'Amilton? No, Israel climbed up the light mast 'igh enough for 'is weight to capsize the dingey. As soon as the boat turned over on its side and the water came in, the moray saw the way to freedom, and dashed back to 'is 'ome in the reefs, 'avin' beaten two good men and gotten away 'imself."

CHAPTER VII

HARPOONING A GIANT SEA VAMPIRE

Colin wakened early the following morning and got up promptly, planning to show his alertness, but when he came downstairs and sauntered out between the oleander bushes toward the water he heard a hail and found that his chief was already up and was busy unpacking some large boxes which had been delivered the night before. The boy hurried to help him.

"What are these, Mr. Collier?" he asked, as some large square boxes with a window in the bottom came into view.

"These are water glasses," the scientist answered, "not the kind that is used by tourists, but some I have had made specially—lenses with reflecting mirrors; with them the bottom of the sea ought to show up clearly. As you notice, they are long enough to be usable from the deck of a fair-sized sailing boat. It's a shame only to half-see things as beautiful as the sea-gardens. When a thing's worth while, it is so much worth while."

"I thought you would probably have to dive," Colin said, "in order to see the submarine gardens thoroughly."

The curator shook his head.

"You'll find," he said, "that we can see almost as well with these as though you and I were a couple of angel fish, swimming in and out of the grottoes of the coral. The water—as you noticed when we were coming into the harbor—is as clear as crystal. There's nothing in coral sand to make it cloudy or muddy."

"Are we going out this morning?" the boy queried eagerly, as he helped in the unpacking of the various instruments that the museum expert had brought.

"The boat is to be here at half-past eight," was the reply, "and we're going to find the most beautiful spot that there is in the submarine Garden of Eden. Our darky boatman, 'Early Bird,' they call him, says he knows a place quite far out on the reef where there are wonderful groves and parterres unspoiled by tourists because they lie so distant that it is not worth while for the excursion boats to make the trip."

"I don't quite see," said Colin, "how the visit of tourists floating over a stretch of sea could harm the seaweeds and the coral growing on the bottom."

"But it does, because a number of the glass-bottomed boats carry a diver who goes down and breaks off specimens of coral at the tourists' request, selling them for a good sum. But the gardens to which we are going, I understand, are entirely out of the beaten track and are very much finer besides. Here is 'Early Bird' now."

As he spoke, a white sailboat with a large spread of sail came skimming into the little bay, heading for the private wharf of the hotel at a rapid clip. Colin held his breath as the craft came rushing in, for the inlet was not much wider than twice the length of the boat and it seemed certain that the vessel would crash full upon the rocks not twenty feet beyond the wharf. But at the very last second the tiller was put over, the sail jibed, and as gently as though she had crept up in a calm, the *Early Bird* glided up beside the wharf, her bowsprit narrowly missing the bushes on the bank as she turned.

"You sure can handle a boat!" cried Colin admiringly.

The owner of the vessel, a young colored man, of good address and with a clever face, showed his white teeth in a gratified smile as he replied:

"Yas, sah, Ah've sailed a boat roun' the harbor quite a good deal."

"It looked that time as though you were going to be smashed up, sure."

"Ah nevah even scraped the paint of a boat in ten yeahs o' sailin', sah," the colored boatman answered, "an' thar's lots o' shoals, too."

"It looks as if she were resting on the bottom now!" the boy said.

"No, sah," was the confident reply, "the tide's full in an' Ah knows this whahf right well. Thar's two feet of wateh under her, right now."

Early Bird—for both boatman and boat answered to the same name—deftly took aboard the glasses and other special material that had been prepared, not forgetting a large lunch basket that had been sent down from the hotel, and then he pushed off into the clear and shining water. The early morning breeze laid the little craft over on her side but she had a good pair of heels and in a few minutes the party was well on its way across Grassy Bay.

"Where are we going?" asked Colin.

Early Bird pointed beyond a group of small islands to where there seemed to be a depression in the land.

"Thar's a channel, sah," he said, "right in between those two islands. Thar's a swing bridge across, but the keepeh is always on the lookout and we can go right through."

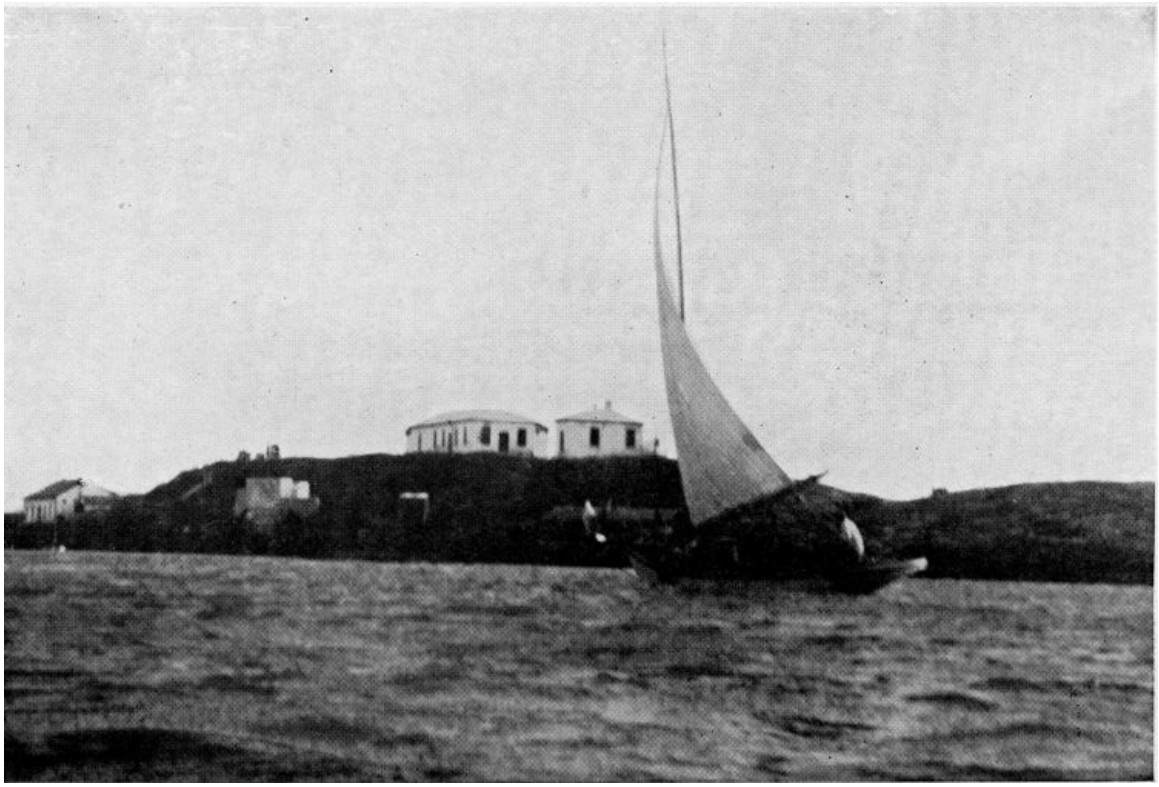
A half hour's sail brought them to the gap between the islands. Though the bridge was shut Early Bird steered confidently straight for the center, and it swung just in time, the boat shooting by with undiminished speed and rounding a point to the open water beyond. Before them stretched an unbroken vista of ocean.

"The next land south of you, Colin," remarked the curator, "is Antarctica."

Colin thought for a moment, then said in a surprised voice:

"Why, yes. Bermuda is an isolated point, isn't it? I hadn't thought of that before. Nearly all islands are in chains, but this little bit of a place is set off all by itself. I wonder why that is?"

"Bermuda is the top of a submarine mountain," was the reply, "perhaps part of the lost Atlantis—who knows? This stupendous peak rises almost fifteen thousand feet sheer from the ocean bed and its rugged top forms the basis of the islands. Think what a magnificent sight it would be if we could see its whole height rising from the darkness of the ocean deep."



The *Early Bird* Passing the Bermuda Aquarium, Agar's Island.

Photograph by C. R-W.

"But I thought Bermuda was a coral island!"

"The coral polyp has got to grow on something, hasn't it?" the scientist reminded him. "Don't forget that the little creatures can't live in deep water. And, you see, Bermuda has gradually been sinking, the coral builders keeping pace with the subsidence, so that although the island is only two miles across at the widest point the reefs are ten miles wide."

"It really is coral, then?"

"As much as any island is. The base of any coral island is limestone, being made of the skeletons of coral polypi which have been broken and crushed by wind and weather and beaten into stone. Just as chalk is made of thousands of tiny shells, so coral limestone is made of myriads of coral skeletons."

"Why, that's like sandstone," cried Colin, in a disappointed tone. "I had an idea that coral was a sort of insect that lived in a shell and that colonies of these grew up from the bottom of the water like trees and when they died—millions of them—they left the shells and these stone forests grew up and up until they reached the top of the water and then soil was formed and that was how coral islands began."

"I'm not surprised at your thinking that," his chief replied, "lots of people do. And though that theory is all wrong, still if it has given folks an idea of the beauty and wonder of the world, there's no great harm done. Plenty of people still talk about the coral 'insect.' It never occurs to them to call an anemone an 'insect,' but they don't know that the coral polyp is more like an anemone than anything else."

"But an anemone is a soft flabby thing that waves a lot of jelly-like fingers about in the water."

"So does coral," was the reply, "and it eats and lives just in the same way, only that the coral polyp has a stony skeleton and most of the sea anemones have not. But every different one has some sort of a story to tell and I believe they get joy out of life just as we do. Else why should some of these forms be so beautiful? You note them closely when we pass over some of the reefs, and I should judge we are coming to them now."

Certainly if the coloration was any clue, the boat was coming to the great sea-gardens. Above the white bottom the water shone a vivid emeraldine green, changing to sharply marked browns over the shoals, while beyond the inner reefs it varied from all shades of sapphire blue to radiant aquamarine. Nowhere was the water of the same color for a hundred yards together, while every ruffling of the surface, every slant of sunlight gave it a new hue. Colin was entranced and wished to see more closely, but the boat was going too swiftly to let down a water glass and he was forced to wait a few minutes.

"Ah b'lieve, sah," said Early Bird presently, hauling in the sheet, "we might let the sail down heah. We'll drift just about fast enough fo' you to watch the bottom."

Mr. Collier handed one of the water glasses to the boatman. It was formed like a deep square box with a glass window for a bottom, and a specially prepared crystal had been used.

"That's an improvement on the old kind, Early Bird," he said; "what do you think of it?"

The Bermudian darky looked through the glass critically.

"Yes, sah," he said, "thar's no compah'son 'tween the two. The bottom looks bettah through that glass than it does when yo' down theh yo'self. Ah used to do a little diving at one time, but the reefs nevah showed up that cleah. It would be a big thing fo' the boats that take tourists out if they could have glasses like that one there."

"It would be, perhaps," the scientist said, laughing, "but they could almost build a boat for what one of these would cost."

"Isn't that the most gorgeous thing you ever saw!" cried Colin, as he set his eye to the glass, which Early Bird handed him. "There's no garden on land with such colors as that."

"There are no flowers in the garden you're looking at, remember," his friend reminded him.

"Don't need them," said the boy. "Look at that tall purple plant waving to and fro. Isn't that a sea-fan?"

"Yes," his companion answered, "that's a sea-fan, but it isn't a plant. It's a kind of coral."

"Is it? I always thought it was a seaweed."

"You'll be calling a sponge a plant next. See those red lumps, near the bottom of that rock? Those are sponges."

"Now there's some real coral!" the boy cried.

"All coral is real coral. What you are looking at is probably a form of the stag's horn variety," the curator said, "and that does look more like the coral of commerce. But everything you are looking at, nearly, is coral. These great dome-like stones, do you see them?"

"The ones that look like the pictures of a brain?"

"Yes, those are called brain-stone or brain-coral. And those others, just the same shape only with little holes, instead of grooves, that's star coral."

"Then there seem to be some that look like a bouquet of flowers all stuck together."

"That's rose coral," was the reply, "and those are the three forms you see more generally."

"But where's the pink and red coral? If it's as easy to get at coral as this, I don't see why people don't come here and make a fortune."

"Fortunes aren't quite as easy to pick up as that. This coral has no market value; the variety that is used for jewelry comes mainly from Japan and from the Mediterranean, and the governments of the various countries keep it under constant watch."

"That's why. I see now. Oh!" exclaimed the boy as some fish swam under the glass suddenly. "Just look at those angel-fish. They seem twice as brilliant as the ones I saw in Devil's Hole."

"Of course," the curator said, "you would expect them to look dull in dull surroundings. That is color protection. Here, everything is gaily colored and striped and streaked and dotted, so the fish are, too. That helps them to hide and be unnoticed. A plain-colored open sea fish could be easily seen."

"Look, sah," said Early Bird, turning to the boy, "Ah've got a little sailoh's choice, Ah caught this morning; Ah'll throw him in and yo' can notice how plain yo' can see him."

He tossed the fish overboard. The silver scales shone and gleamed brilliantly in the transparent water but Colin had barely time to notice what a conspicuous object it was when in a swirl of water a score of small fish of all sorts surrounded the morsel. But the groupers followed hotfoot and the little fish fled. Then came retribution, for, from a crevice in a near-by rock, out shot the eel-like form of a green moray and disposed of one of the groupers in short order.

"Did I tell you about the moray?" Colin asked, and on receiving a reply in the negative, he recounted the story he had heard in Devil's Hole. The boy rather feared that Early Bird might make light of it even if the museum curator did not, but the darky remarked that he thought it was a good thing to let morays alone and that he had heard the story from other sources before. In the meantime the leader of the expedition had found a section of the reef which appealed to him and at his request Early Bird put out a small kedge anchor, holding the boat fast. The wind had dropped a good deal as the morning wore on and now the little sailing boat rocked gently over the gorgeous gardens of the sea.

"You told me," the museum official said, "that you were fond of drawing. Here's a sketch block and some pastel crayons; see what you can do with them."

Colin lifted his eyebrows in surprise, but he took the sketch block and pad, hooking his water glass to the side of the boat as directed. His companion took a large water glass of a different character. It was right-angled with a lens at the end. In the joint of the angle was a reflector which threw the image upon a mirror immediately under the eye-piece.

"What's that for?" the boy asked.

"So that we can look at the reefs at their own level," was the reply. "No matter how much you allow for refraction and foreshortening, you'll find it almost impossible to get correct values by studying a reef from the top only. You know how queer a place looks in a picture that has been taken from an aëroplane?"

"Yes," the boy answered.

"That's what we've got to avoid here. We are looking down on the reefs just as an aviator looks down on a city. This glass, however, will give me the proper perspective. You see I have made it something like a telescope so that I can add segment after segment and watch conditions even in fairly deep water. Now I'll show you how I'm going to manage it."

He took the long L glass with which he was working and fastened it by little hooks to the direct overhead glass which Colin was using, and as he did so the boy noticed that the two glasses were so arranged that they focussed at the same point of the reef, only that one viewed it from above, the other from the side. A little device worked by a thumbscrew varied the angle in proportion to the depth.

"Now," he was instructed, "draw in and color—as well as you know how—everything you see in the field of your glass. You've got all day to do it in, so there's no need for hurry. Remember, I don't want the color you think the sea-fans and other forms would be out of the water, but the color that they seem to you to be when looked at through the water."

"But I don't draw so awfully well, Mr. Collier," said Colin.

"You don't need to," was the reply, "it's the color that I want. There isn't a tint known that you can't find in those pastels and I want it as exact as you can get it. I'm going to do the same thing, you see, only from the side. The light will cause a good deal of difference, and I want to determine just how the shadows fall."

The boy had never had such crayons to work with and he was naturally a good colorist. He became so absorbed that he was quite unaware of the passage of time and it was with something of a surprise that he heard the announcement of lunch. This was due to Early Bird, who, seeing that it was after noon, had unpacked the hamper and set out a good meal. Both artists dined heartily and Early Bird was not forgotten when the artists returned to their drawings. But although Colin worked as hard as he could, it was four o'clock before he felt that he had finished. The museum expert was also still at work when the sun began to fail to give a sufficiently direct light to pierce the water. Colin was eager to see his companion's sketch, but this was denied him.

"No," he was told. "We're coming here to-morrow, and I want you to do what I was doing to-day, while I do the overhead view."

"What's that for, Mr. Collier?" queried Colin, again.

"No two people see color values just alike," was the reply, "and while of course I don't expect you to make a perfect picture, still if your coloring and mine agree, we are nearly sure to have exactly the right shade."

"But if they don't?"

"Then we have two color conceptions, and it is easy for a third person to say which looks the most real to him. Early Bird, for example, could tell which looked the best to him, although, of course, he could not describe the color."

"Then we're coming back here to-morrow?"

"If the wind is suitable, yes."

Colin was simply aching with eagerness to see the other drawing but had to be content with the promise that he could see it as soon as he had done the duplicate, and not before, as he might be prejudiced thereby. Before going home that day they dropped as a marker a heavy lead disk about six inches across, painted white, to which was attached a buoy, so that they could find the identical place again; and the following morning, when they came out, the buoy was picked up without difficulty and the boat moored as before.

The second day on the reefs was an exact counterpart of the first, except that Colin found it much more difficult to work through the L glass. To look down at a picture which was reflected sidewise made the drawing of it quite tricky until he caught the knack. Also, shadows under the water did not behave the same way as above. But, as before, the entire day was given to it, and though the boy had a headache when evening came, he had turned out a very respectable piece of work. The fun came in comparing them.

"You're somewhat of an impressionist," the curator said, as he examined Colin's two pictures carefully, "and you've succeeded in making your sketches look more submarine than I have. But I think your perspective is all out."

"I was afraid that it was," the boy replied, "though I tried hard to get it."

"What do you think of them, Early Bird?" the museum expert asked, "I won't tell you which is which."

The boatman, who had a full share of the intelligence and alertness characteristic of the Bermuda

colored population, so excellently governed under British rule, examined the four pictures carefully and then said:

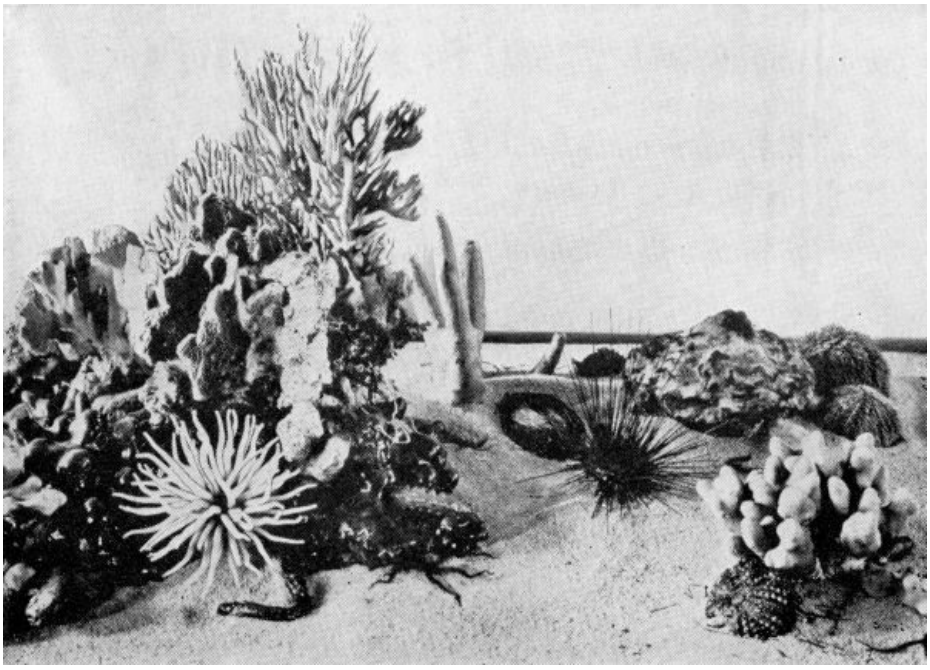
"Wa'al, sah, Ah think Ah like these two the best."

He handed back Mr. Collier's drawing of the reef from the side and the boy's sketch of the reef taken from above.

"I believe you're right, Early Bird," the scientist said, laughing, "the lad beat me out on that one." Then, as he put the drawings away in the portfolio he added, "And now we'll see how near we both came to the right thing."

"How?" queried the boy.

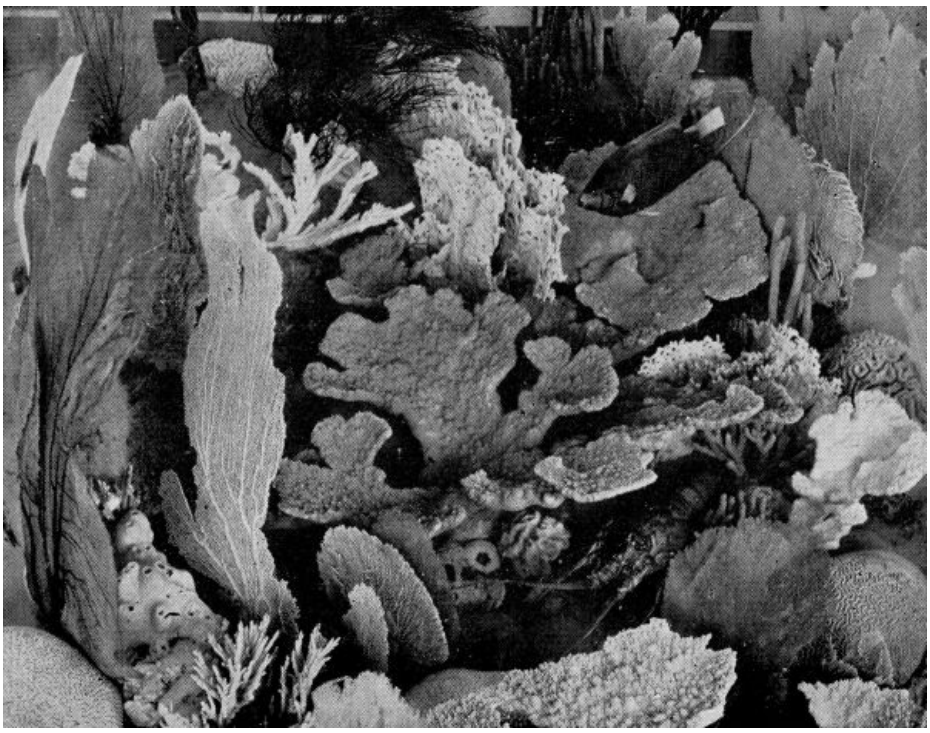
"We'll search a while for perfect specimens. A diver is coming along with us to-morrow and we're going to scour the reefs for fine specimens of coral, sea-anemones, sea-whips, black rods, purple fans, and all the rest of them. Those that we can preserve we will, but the sea-anemones we'll have to work on in the Aquarium on Agar's Island, where they have some magnificent specimens."



The Gorgeous Submarine World.

Golden sea-anemones, purple long-spined sea-urchins, orange-colored sponges, and corals upon the white sea-sand.

Courtesy of the American Museum of Natural History, N. Y.



The Gardens of the Sea.

Where purple sea-fans wave under the crystal water. Note the angel-fish and various forms of coral.

Courtesy of the American Museum of Natural History, N. Y.

"In glass, you mean?" queried Colin. "I should like to see how that's done."

"Come to my laboratory in New York some time and I'll show you," his companion answered, "but I can't do that here. I have a specially prepared black paper here and I'll copy some of the anemone forms so that I can plan them in glass from my drawings. I'll go with you to-morrow, but after that you'll have to go out alone."

Accordingly, Colin and the diver went out with Early Bird every day for a week, Colin spending the entire day peering through the water glass for perfect specimens, which, when sighted, the diver would descend to get. He secured an especially fine example of a long-spined black and white striped sea-urchin, with spines nearly seven inches in length, a number of pale-blue starfish (an unusual color in that genus), and one superb sea-fan of a glowing purple color nearly five feet across. Of sea-anemones he found a large variety, and those he brought to the aquarium, where Mr. Collier was working steadily; several kinds of "sea-puddings," closely allied to the famous beche-de-mer—the table delicacy of China—also were within his discoveries. The boy's eyesight was keen, and the collecting fever found him an easy victim, but it was back-breaking work to stoop over the water glass all day.

After about a week of this, however, a surprise awaited him. He noticed, as they sailed into the bay, a very handsome steam yacht lying at anchor, a sea-going craft flying the New York Yacht Club's burgee. On his return to the hotel Colin found his chief waiting for him, a little impatiently.

"We're going to dinner on the *Golden Falcon*," he said, as soon as he saw the boy, "she belongs to a friend of mine. He is going down to Florida and has offered to take us along. If I can arrange it, that will save us at least a week's time."

"Bully, fine!" Colin exclaimed. "Is that the yacht down there?"

"Yes."

"She's a beauty. All right, Mr. Collier, I'll get ready just as fast as I can. And you ought to see a feather star I got to-day. It wasn't so awfully deep down either."

"I'll see it later," was the reply, "hurry and get ready now; I don't want to be late going over there. Their launch is to come at half-past six and it is twenty after now, so that you need to move as fast as you know how."

"Right, sir," answered Colin, and off he sped.

The yacht was the finest of its kind that the boy had ever boarded and he spent a very pleasant evening, the more so as the owner of the vessel had his family aboard, including his son Paul, a lad almost the same age as Colin. Mr. Murren was a wealthy capitalist, who had financed a chain of drug-stores throughout the country and still kept a large amount of stock in them. This corporation used many thousands of sponges annually, needing moreover a high-grade article which was found difficult to procure. It had been thought wise to investigate the question of buying a sponge farm, and he had been asked to look into the matter. Accordingly, he was taking a run down the coast, but had come first to see the American Vice Consul at Bermuda—to whom he was related by marriage.

"I heard a good deal about that sponge-farming business," said Colin, when the other boy told him this. "Dr. Crafts told me how it was worked."

"All the more reason for you to join us," his new friend responded. "I hope you're coming."

"I hope so, too," Colin answered, "and it's likely enough that we will, since you say your father has been kind enough to ask us. I think Mr. Collier has nearly finished what he wanted to do in Bermuda, and if you are going straight to Florida, it would save us a lot of time, as well as being a jolly trip in itself."

"Going to do more coral-hunting?" the other boy queried, for Colin had told him about his Bermuda work.

"A little of that, I think; but I believe Mr. Collier intends also to make an exhibit showing the way sponges grow. So you see he is as much interested as your father in reviewing the sponge question."

At this juncture Colin heard his name called.

"Yes, Mr. Collier," he answered.

"Do you think you have been over most of the reef?"

"Yes, sir, I think so," the boy answered; "Early Bird said yesterday that we had covered the sea-garden grounds fairly thoroughly. But, of course, there are miles of reef that we haven't seen."

"I think, Mr. Murren," the scientist said, turning to his host, "that I can finish up all my business here by to-morrow night and be ready for a start the following morning. If that's agreeable to you, we shall be very glad to accept your invitation."

"That's agreed, then," said the capitalist, "and now we'll have some music."

The trip to Florida on the *Golden Falcon* was one of the pleasantest Colin had ever known. The little craft fairly flew through the water. He liked his host and hostess immensely, both of whom

were accomplished musicians, and he struck up quite a friendship with Paul. The capitalist's son, though but a month or two younger than Colin, was quite inclined to give the latter a little hero-worship. And it was significant of Colin's make-up that he was equally ready to take it. Little of note occurred on the voyage save that the yacht almost ran over a sunfish in the water, which turned a sluggish somersault and disappeared. What was of more interest to Colin and indeed to Paul also was the opportunity to use a very powerful microscope belonging to the museum curator and to find out about the almost invisible life of the ocean.

"You must remember," the scientist told them, "that these tiny forms, which look like the most wonderful figures in a fairyland of geometry, exist in such billions that as they die, their light shells fall through the sea like a perpetual rain. Some of them, too, are so very light that it takes them a month to sink to the bottom."

"But what can such tiny bits of things live on, Mr. Collier?" asked Paul; "other animals smaller still?"

"No, my boy," was the reply, "on plants called diatoms. There are over four thousand species of these plants known, which are so small that the microscopic animals readily engulf them. Where it is too cold for surface animal life, as in the Antarctic Ocean, these dead diatoms form the mud on the bottom of the ocean, and in the extremely deep parts, the sea-bed is red clay, but most of it is an 'ooze'—'Globigerina,' as it is called—made up of the shells of those very creatures you have now been seeing on that microscope slide. You drop in and see me at New York, boys," he added kindly, "and I'll show you some models I have made of them."

On arrival at Key West one of the first things that impressed itself upon Colin was the sponge wharf, where tens of thousands of sponges of every sort were drying in the hot September sun. The conversation had run upon sponges very frequently during the voyage, and Mr. Collier, who knew the subject thoroughly from a theoretical point of view, had been of great help to his host. But the economic and commercial side of the question was another matter. From this aspect Colin found that the remembrance of his conversation with Dr. Crafts in Washington stood him in good stead.

"As I understand it, Mr. Murren," he said, as they stood on the wharf together, waiting for an approaching boat, "the government looks on the business of growing sponges much as it does on the growing of wheat or any other form of farming, only it is called aquiculture instead of agriculture. Sponge planting isn't so very different from potato planting."

"It looks entirely different to me," the boy's host replied, as he went down the wharf steps. "I'm sorry Mr. Collier was called away this afternoon, but I may as well give a preliminary look over this sponge-farming business and you boys might as well come along. There's a man here who wants me to buy his sponge farm. Since Mr. Collier is here I'm not going to decide anything without his advice. He doesn't want you this afternoon, does he?"

Colin hesitated a moment.

"Not as far as I know, Mr. Murren," he answered.

"I wish you would come, then," urged the capitalist. "You've picked up some ideas in Washington which may be of help."

"I'll be glad to come, if you feel I'm any use to you," the boy replied, flattered at this evidence that he could be of service, "I was only afraid that I'd be in the way."

Colin followed Paul and his father into the boat, where was waiting a negro as black as the proverbial black hat, a local fisherman who had taken up sponge growing, and who, while shrewd enough for a business deal, knew little about sponges.

"You were saying that the Bureau of Fisheries is going to take up sponge-farming?" the prospective buyer asked. "Do you know what success the government has had so far?"

"Enough to show that it can be done and that's about all," the boy replied. "Before long, I think, the Bureau will have a station down on the Keys here and that will be one of the first questions they will probably take up. As I heard it put, the Bureau aims to farm every acre of water as thoroughly as every acre of land."

"That," said the capitalist, "is an ideal that gives all sorts of chances for development."

Presently the boatman stopped and, resting on his oars, said:

"Lots o' sponges hyeh, boss."

The would-be buyer took the water glass and looked through it at the bottom, but he was unaccustomed to the appearance of growing sponges and also to the use of a water glass, so that he gained little from it.

"I don't see any," he said.

"Aren't there any round liver-colored lumps, Mr. Murren?" the boy asked.

"Yes, there are lots of those," was the reply.

"Those are sponges."

"They don't look like it."

"They are, sir, though. A skeleton doesn't ever look just like a man. The sponge, as you use it in a bath, is just an animal's skeleton, or it may be of several animals that have grown together."

"Yo' suah o' that, boss?" asked the boatman. "I allus hear' dat a sponge was a plant—not any animal."

"It's an animal," Colin said shortly.

"But I thought," interjected Paul, "that the difference between a plant and an animal was that an animal can move around and a plant can't."

"Well, Paul," the boy answered, "the young of sponges are larvæ which swim in the water by threshing with short hairs until they find something suitable to stick on. Lots of animals which become fixtures are free-swimming when young, oysters, for instance."

"Then a sponge doesn't seed itself, like a plant?"

"No, Mr. Murren," said Colin; "so far as I understand, the larvæ, though of a very simple type, have a certain amount of choice. A seed has got to grow where it falls, or not at all, but a sponge larva, if it doesn't find a suitable place on the first thing it touches, can swim about blindly until it finds one that will do."

"Now about these sponges, Colin," his host said, impressed by the boy's clear though crude way of explaining himself, "look through the glass and tell me what you think about the bed."

"There are quite a lot of sponges there," the boy answered after a few minutes' examination, "some of good size, too, but a number of them are dead. See, the sand has drifted half over them. There's too much sand and too little rock."

"Should they have a rock bottom?" the manufacturer queried.

"Rock am de bes', suah," the owner of the ground put in, "but a li'l bit o' san' don' do no hahm. It shows dat de wateh am runnin'."

"Yes," said the boy, "the boatman is right there, Mr. Murren, sponges must be in a current after they have once taken hold. They can't swim around to get their food, so, like all the fixed forms of life, their food must come to them. If there is no current there is not enough food carried past for them to live on. If the current is too strong the sponge has to make an extra tough skeleton to brace itself against the rush of water and then it becomes too coarse for commercial use. Some of the polyps live on tiny animals with a lot of flint in their shells and the skeleton gets like glass. They call them glass sponges. Conditions have got to be just right for their development, they're a most particular sort of creature."

"But how do they feed?"

"A sponge is a jelly-like colony of cells with a fibrous skeleton," the boy explained; "the outside of him is toward the water and is full of small pores which branch all through his flesh and open at last into a big pore leading to the outside. All these pores are lined with tiny hairs that make a current of water go through the jelly-like flesh, which absorbs any microscopic life there may be. The water is taken in through the little pores and sent out through the big ones. Some sponge forms are of one animal, most are of colonies. But they are all on the same pattern, pumping water in and out again."

"Then is a growing sponge all full of jelly?" asked Paul.

"All that I have seen are," Colin replied.

"How do they get it out?"

"I c'n tell you 'bout that," interjected Pete. "A sponge is all slimy an' nasty. Yo' put him in de sun an' he dies quick an' all de slime runs out. Den yo' buries him in san' 'til his insides all decay. Den you puts him in a pon' an' takes him out, an' beats him wif a stick, lots o' times oveh, maybe, 'til all de jelly an' all de san' an' all de muck am out ob him. Den yo' wash him in fresh wateh 'til he's clean an' lets him dry an' he's done."

"But if sponges will reproduce themselves," the capitalist said, returning to his former point, "what is the need of planting them?"

"You don't have to work that way on their own beds, sir," the boy answered, "planting is done to get more out of the industry, using the sea bottom in shallow waters which now is lying unused."

"And you say only rocky land will do?"

"Any bottom that's hard enough to keep the sponge from being covered up, Mr. Murren. Soft sand will wash, mud will ooze up, and rank marine grass or seaweed will smother the young cells. But any hard bottom in warm salt water with a current is good for sponges."

"I see," was the rejoinder. "As you say, the situation is not unlike farming. You can either farm cultivated sponge land or plant uncultivated land."

"You can get land suitable for sponges for almost nothing, I suppose," Colin said, "and then if you

had a small sponge ground you could plant a larger area from it."

"What do you think of this ground?"

The boy hesitated.

"I hardly think I know enough about it to say, Mr. Murren," he said; "you ought to get an expert."

"I'll get an expert before I pay cash," was the prompt answer, "but I want to know what you think."

"Well, then, sir," Colin answered, "I think it's good ground, but not good enough."

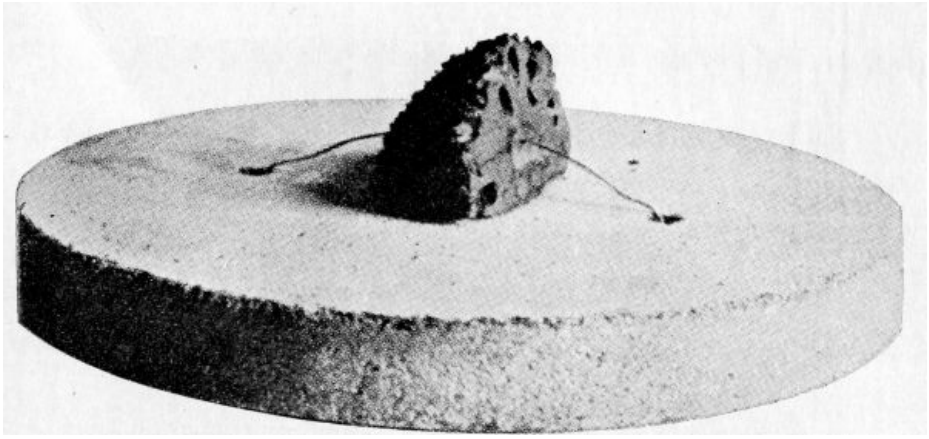
"Ah got a betteh one than this hyeh, boss," put in the boatman, "it's mah brotheh's, but he might be willin' to sell. Costs mo' than mine, though."

"Take us there," ordered the capitalist.

The boatman took to his oars with a will, but it was a long pull, almost an hour elapsing before he stopped, wiped his forehead on his arms, and said, as before:

"Lots o' sponges hyeh, boss."

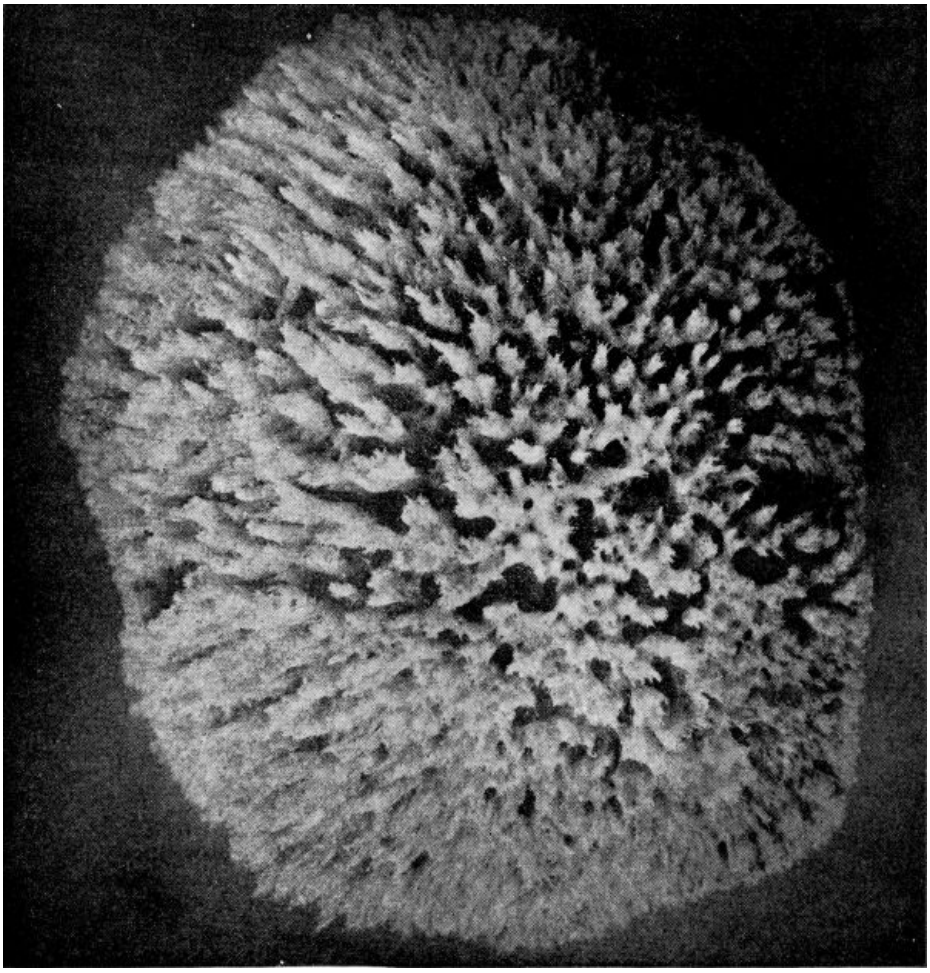
At a nod from the prospective buyer, Colin took the water glass and watched the bottom carefully as the boatman rowed slowly over it. How the boy wished for the lenses in the glasses belonging to Mr. Collier which he had used in Bermuda! But still, though the afternoon was drawing on and the sun did not strike the water at the right angle, Colin could see that it was unusually fine sponge ground.



Young Sponge Attached to Cement Disk, Ready for Planting.

(Actual size.)

Courtesy of the U. S. Bureau of Fisheries.



**Sheepswool Sponge grown from small piece as above,
48 months old, six inches across.**
Courtesy of the U. S. Bureau of Fisheries.

"Yes," he said, "that's more like."

Mr. Murren looked about him.

"How in the world do you know, Pete," he said to the boatman, "that this is your ground or anybody else's? I don't see any stakes or evidences of ownership."

"If Ah starts to haul up sponges on somebody else's groun' he'll come up and make me get off, suah," replied the boatman.

"But suppose he doesn't see you."

The boatman grinned.

"Dat certainly am his own lookout, boss," he said.

"What a cut-throat game," ejaculated the would-be buyer. "If a man bought a place he'd have to watch it all the time, then?"

"Suah, sah."

"Thank you," was the reply, "I'll take some place in shallow water where I can build a house and hire some fellow to watch it and work it."

"Ain' no trouble hyeh," the boatman said, shrugging his shoulders, "ev'body wo'k his own patch."

"But how do you get the sponges?" was the query. "You have to dive for them, don't you?"

The boatman shook his head.

"Sometimes, if de wateh's mo' than fifty feet deep. Not of'en. See, Ah show you."

He reached under the forward thwart and pulled out a light three-pronged hook and fitted it to a jointed pole, screwing the two sections together so that it made one long pole of about twenty-four feet in length. He took the water glass and rowed the boat until it was directly over a sponge.

"Yo' all keep de boat dere a li'l while," he said to Colin, and the lad took the oars.

Then very deftly the boatman pushed the long unwieldy pole into the water and nicked a sponge from the bed, bringing it up intact. On reaching the surface it was seen to be slimy and with a milky fluid dripping from the bottom.

"That's a ripe sponge, you see, Mr. Murren," the boy said, pointing to the milky fluid; "the slimy

stuff that's dropping is full of germs of young sponges all ready to grow and swim and fix to something and then become proper sponges."

"That may be a sponge," said the prospective buyer, "but it looks more like a piece of liver."

"Fine sponge, sah,—good yellow sponge," the boatman said, and Colin did not know enough either to affirm or deny.

"Now, Ah show yo' sheepswool sponge, quite diff'nt," the boatman said, and taking up his water glass he leaned over the edge.

Just as he did so, both Colin and his companion gave a cry.

"Sharks!"

The boatman looked around contemptuously.

"Nu'sing shahks," he said, "sleep all de time." He splashed his hand in the water and the sharks fled in all directions.

"You wouldn't feel that way if you had been in the water," hazarded the capitalist.

"Ah done ride on 'em," was the reply. "Lots o' boys 'round dese hyeh reefs think it fun to steal up ove' a lot o' nu'sing shahks, an' den dive down an' take a ride. Dey wouldn't bite nothin' biggeh than a sahdine."

"But you have got dangerous sharks here?"

"Yes, sah, you bet," the boatman answered; "dey was one ol' white shahk was a holy terror; he use' to show up hyeh reg'lah once a monf. Folks do say he eat up fo' men at diff'rent times."

"I thought Mr. Collier told us that those shark stories were exaggerated," said Paul, turning to Colin. "I didn't think so, now you see, they weren't."

"Oh, I guess the white shark is the real thing, all right," Colin answered. "Some fishermen found a fair-sized young sea lion almost whole in a shark's stomach about three years ago."

"That must have been the fish that swallowed Jonah," suggested Paul.

"He could have done it all right," the other boy agreed, "and he is about the only fish that could."

"There might be some in the bottom of the sea!"

"I don't think so, Paul. Mr. Collier told me on the steamer that in the very deepest parts of the ocean there were no fish, only worms and sea-cucumbers and things like that."

"If you'll listen a minute, sah," said the boatman, "yo'll heah somefin' wo'se than eveh come from de bottom ob de sea."

"Worse?"

"Worse!"

The two exclamations rang like one as the two boys strained into attention. They listened intently and then across the water came a whisking rushing sound followed by a deep 'boom' and a distant splash. It was several moments, too, before the swell from that splash reached the boat; when it did, the craft rocked noticeably.

"What is that?" asked Colin.

"Vampa, sah," answered the boatman, as he took his oars and started to row away in the opposite direction.

"Hold on a bit there," the sponge-buyer said, "I never saw a vampire. What does it look like?"

"Some calls 'em sea-bat or devil-ray," was the reply, "an' the're twenty, thirty feet 'cross sometimes. They looks lak a sting ray. Ah don' wan' to see 'em."

"Isn't that a harpoon down there in the boat?" the capitalist asked calmly.

"Yes, sah, oh, yes, sah, but Lordy, sah, yo' can' do nuffin wif a sea vampa. No, sah. Why, jes' oveh yondah dey was a big schooneh towed out to sea by a vampa."

"A schooner?"

"Yes, sah, a seven'y-ton schooneh. Yes, sah. He mus' ha' been a big fellah an' goin' swimmin' along he struck de anchoh chain wif his hohns. It made him mad, right mad, it did, an' he jes' heave up dat hyeh anchoh an' toted it off to sea, draggin' de ship wif him."

The owner of the *Golden Falcon* laughed.

"Can you beat that? That's the worst fish story I've heard, Colin. You tell some good ones, too!"

"It's an old story," the boy answered, "and I believe it's true. They have often run away with boats."

The capitalist took off his coat and rolled up his sleeves.

"I've harpooned dozens of porpoises from the *Falcon*," he said, "but I never had a chance at a sea vampire. This begins to look interesting."

"The devil ray, or manta as it is often called, will give you a run for your money," said Colin, "and after all we can cut the line."

"We'll not cut any line," was the response. "Now, Pete, get after him."

But the negro fairly blubbered in terror.

"Lordy, lordy," he cried, "an' what yo' goin' t' do to a po' ol' niggeh. Ah'll do an'thin' yo' say, Ah'll tell yo' de troof about de sponge fahms, an'thin', onl' don' go afteh dat vampa."

"You'll tell me the truth about the sponge farms, eh?" the prospective buyer remarked sternly. "So you were trying to put up a crooked deal. I'll attend to you when we get ashore. Now you row after that 'vampa,' as you call it, and as quick as you know how."

The negro was about to refuse, but he did not dare.

"Oh, Lordy, boss," he cried, "don' go any neaheh. Yas, sah, yas, sah," he added as he saw the yachtsman make a move towards him, "yas, sah, Ah'll row. But we all gwine to be smoddehed alive. Ah jes' knows it."

Again, close at hand, came the swish and the dull 'boom,' and the negro shivered. Colin was conscious that his heart was pounding a little and he caught himself wishing that it were the middle of the day instead of evening. Then out of the water not ten feet from the boat a dark witch-like specter swooped into the sky, black, horned, with bat-like wings and a long naked tail like a gigantic rat.

Pete gave a squeal of fright.

The monster rose till he was almost three feet clear of the surface, then turned so as to strike the water absolutely flat, and just before the crash and splash of the fall, Murren hurled the harpoon into the fish, and sprang back to clear the line. Although drenched and gasping from the torrent of water thrown over the boat by the devil ray, Colin took a bight of the line from the second coil and passed it around the foremost thwart. He was just in time, for a few seconds later the rope tautened. There was just one jerk and the boat started flying through the water, sending up a green wall on either side that threatened to swamp it every instant.

With the fight really begun, Colin became at once quite calm. Paul, who was an absolutely fearless youngster, was laughing in glee.

"Which way are we going, Pete?" asked the capitalist.

"Lordy, Lordy, don' as' me; gwine to de bottom, boss. Ah knows we'he gwine to de bottom."

The negro crouched down in the bottom of the boat, and the sponge buyer roared at him:

"Sit up and watch where we're going, you coward! You know these reefs."

"It don' matteh, boss, de vampa tuhn roun' in a minute an' jump on de boat an' smoddeh we all."

It was not a pleasant suggestion. The ray was undoubtedly big enough to do that very thing, and everybody in the boat had seen its power to leap. But even the little study that Colin had given to fishes came to his aid.

"All rays live on shellfish," he said, "and they have small mouths with plates instead of teeth to crush the shells with. So that it really couldn't do us any harm, any way."

"It's de smoddehin', boss, de smoddehin'. Oh, why did Ah try an' make trouble ober dem durn sponge beds? Ef Ah eber gets on sho' again Ah'll be a betteh man. Lordy, Lordy, what am Ah gwine to do?"

His voice rose in a shriek.

"He's a-comin' now!"

The pointed fin jerked suddenly and a third of the gigantic shape heaved itself into the air as the devil ray whirled. There was an instant of suspense, but the giant went past, one huge fin beating the air like the waving of some uncanny monstrous moth born in the terrors of a nightmare, and the boat was wrenched around sharply, half filling it and almost throwing Colin out.

Over almost exactly the same course that he had taken, the ray raced back, the weight of the boat seeming to make no difference to its speed; and then a second time the creature turned. It seemed impossible that with a speed of not less than twenty miles an hour so huge a creature—the size of one side of a tennis court—could twist about in its own length. How the rope and the frame of the boat stood the strain no one ever knew.

Once more the vampire turned; the boat nearly went over, but she was a staunch little craft, and the fish started down the lagoon between the reefs at its top speed. Often the creature put its two horn-like tentacles down for a dive, but the water was everywhere shallow and there was no chance to drag the boat under.

"It doesn't seem to be tiring much," the capitalist remarked, "but I don't see what more we can

do."

"No," Colin answered, "I don't think the ray feels our weight at all. I believe it's going faster."

"We's all gwine to de bottom," wailed the negro. "Lordy, Ah been a bad man, but ef Ah ebeh gets mah two feet asho' Ah'll nebeh do nuffin again!"

There was no doubt of it, the vampire was going faster and faster every minute. The line hissed as it cut through the water, and Pete, despite his moaning, was baling for dear life. Darkness was closing in and the ray sped on. On either side were reefs, and many times the boat grazed sharp coral which would have ripped the bottom out of her if she had struck. Mr. Murren stood by the bow with knife in hand ready to cut, waiting to the last minute.

Presently a line of breakers, between two islets, appeared directly ahead. It was only a matter of seconds till they would be reached, but remembering how the ray had turned before, Colin clutched the gunwale of the boat to prevent being flung out of it like a stone from a catapult when the creature swerved.

"It's a-comin', now!" shrieked Pete. "We's a-gwine to be smoddehed. Oh, Lordy, Lordy, Ah's a dead niggeh."

"Hold on tight, all, look out for yourself, Paul," Mr. Murren cried; "he's turning!"

But he was wrong.

Instead of the black fin edging its way up, the whole great bulk of the uncanny creature heaved itself above the water like a great cloud and fell into the surf on the rocks, flapped upon them, although half stranded, and with a heave that seemed to make the reef tremble, plunged into the sea beyond.

"Better cut!" cried Colin.

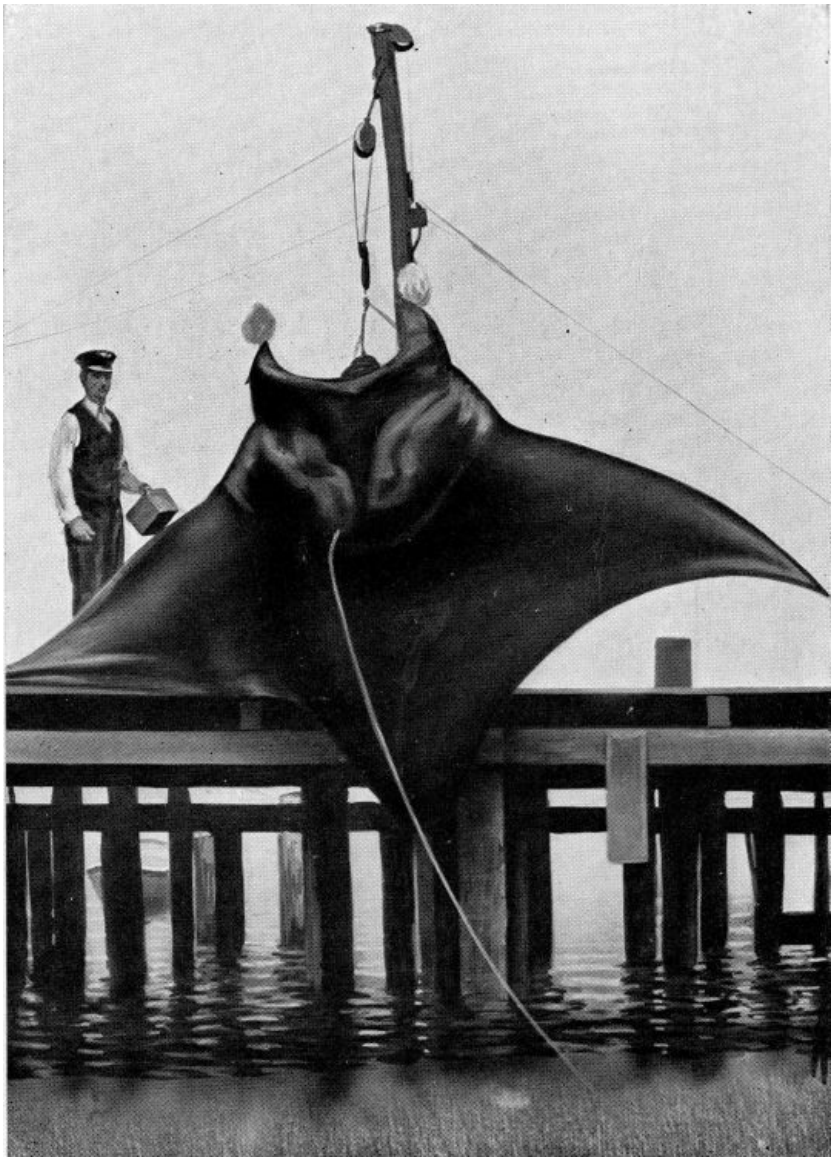
But before the word was fairly out of his lips, the bright steel gleamed in the dark, and with a grinding crash that seemed like the end of the world to Colin, the boat crumpled into splinters on the reef and the three men were thrown in a heap among the breakers.

The negro gave a yell that was enough to scare any one out of a year's growth and lay spread out upon a rock as though he was some ungainly kind of black crab, arms and legs in every direction, while he fairly gibbered with fright.

"Lordy, Lordy, don' let de debbil come an' take me now! Lordy, Ah ain' fit to die! Don' let him come back an' smoddeh us on de rocks! Ah ain' never goin' to get in a boat agen! On'y let me get home dis once!"

Paul, though the youngest of the party, had escaped the most easily. He had pitched clear against Pete and thus had broken his fall, while at the same time the impact of his weight had knocked nearly all the breath out of the negro's body. He had enough left, however, with which to make a powerful complaint.

Bruised, even bleeding in one or two places, Colin picked himself out of the wreckage and looked across in the faint light at the owner of the *Golden Falcon*, who seemed to have escaped with a few scratches and who was standing on the reef looking out to sea as though he wished that the fight were still on.



Manta, or Giant Sea-Devil, Captured on the Florida Reefs.

By permission of Mr. Chas. Fredk. Holder.

"I wonder," he said, as he saw that the boys were not hurt, "if the vampire had as much sport out of that as we did."

CHAPTER VIII

FINDING A FORTUNE IN A PEARL

Resisting a strong temptation to kick the blubbering negro, Mr. Murren succeeded in getting the fellow's attention by shouting in his ear, and yanked him up on his feet. The boat was quite unusable, the bow having been crumpled into matchwood by the force with which the sea-bat had dragged it upon the reef, so the question of reaching the shore was not an easy one. However, Pete knew the keys thoroughly and, in response to much questioning, admitted that it was possible with only a short swim here and there, to reach a lighthouse about four miles away.

The negro would have preferred to stay on the reef until morning, for he could sleep as easily on the sand as in a bed, but Mr. Murren knew that the two boys were not inured to hardship, Paul especially, and he compelled the boatman to show the way. It was a toilsome but not particularly dangerous journey, and when they reached the lighthouse, and had done full justice to a quickly-prepared meal, they were quite willing, as Paul declared, to tackle another sea-bat. There was a small motor-boat owned by the lighthouse-keeper, and the party borrowed this, reaching the *Golden Falcon* without further misadventure, the capitalist recompensing the cowardly negro for the loss of his boat.

Owing to the thorough work that had been done at Bermuda, and having the assistance of his capitalist friend, Mr. Collier speedily secured the specimens and the drawings he needed of the Florida reefs. He kept Colin hustling, but found time to enter into the question of the proposed sponge-farm with a great deal of interest, and went with a party to Anclote Key, where the Bureau of Fisheries had established a station for the investigation of the sponge industry, with especial regard to the transplanting of sponges. The government expert welcomed them heartily,

and an arrangement was entered into whereby the Bureau accepted Mr. Murren's offer to use for its experiments a part of such sponge-ground as he should acquire, while he, at the same time, had the benefit of the advice of the investigators.

"It seems to me," the capitalist said, when the details had been concluded, "that's about the best kind of investment I know, getting expert opinion for yourself in such a way that it benefits the whole nation."

"It is, I think," the Fisheries official replied; "but you can't always get people to realize that. Why, even the State governments in many cases are not always ready to co-operate, and only last year the Assembly of a certain State refused to permit the establishment of a hatchery, because a relative of one of the assemblymen owned a summer hotel in the district, and he thought it might reduce the number of fish in a lake near the hotel."

"How absurd!"

"Of course, it's absurd, but it's amazing how often that sort of thing happens. Still, even State governments are becoming more intelligent now, and some, like Rhode Island, for instance, have been in the very forefront of Fishery administration."

"Yet it means money in the pockets of the people to conserve fish!"

"But also it means a certain small outgo from the Assembly," was the reply; "there's the rub. But," he added, turning to Colin, for the boy had told him of his plans, "by the time you're through college and on the permanent rolls of the Bureau that sort of ignorance about the value of Fisheries control will probably all have passed away."

"I hope so," the boy answered, "and I'm glad that I haven't seen anything except hearty support. Going to Brown University, of course, is a whole lot in my favor, because I understand they've always been strong on the Fisheries side."

"You're going to leave us to-night, then, Colin?" asked his host.

"Yes, Mr. Murren," the boy replied; "by taking the evening train, I can get to Providence in time for the opening of college, and Mr. Collier is kind enough to let me start right away. I can't be grateful enough to you, sir, for all your kindness on this trip."

"That's all right," his friend said heartily, "I've enjoyed having you, and so has Paul, I know. I shall hear from you occasionally, I hope, and maybe the *Golden Falcon* will have you on board for some other trip."

"Thank you ever so much, sir," Colin answered; "but I guess I'm booked for college steadily until next summer, and the Bureau of Fisheries during vacation."

But Colin was mistaken in his idea that almost a year would elapse before he was busy again with Fisheries work, for shortly before the end of his first term, he received a letter from his father in which the suggestion was made that the boy should spend a week on the Great Lakes during the Christmas vacation, to get an idea of what winter work was like. Colin smiled as he read the letter, for he knew well that he was 'in for it,' since his father would make him go through every step of the training.

Accordingly, one cold day, he found himself aboard the steamer *Mary N. Lewis*, which had been chartered by the Bureau for a couple of weeks' trawling in Lake Michigan. A bitter wind was blowing and lumps of ice floated near the shores. The whitefish were not plentiful that winter, and when the nets came up and Colin had to pick fish out, b-r-r-r, but it was cold! A great many of the fish were not ripe for spawning and had to be thrown back again, which delayed matters greatly and kept the party on the water for several days.

Frequently Colin's lips were blue and his fingers numb, while his ears and cheekbones and chin felt as though they were being sliced off gradually by the blasts blowing down from icy Canada, but he knew that, to a certain extent, he was on trial, and he laughed and joked and managed to keep his spirits up, though his teeth chattered. There was no great amount of excitement in catching the whitefish and securing the spawn for development in the hatchery, but it was a test of endurance, and incidentally the boy learned much about the fishes of the Great Lakes.

"There's one thing I don't quite see, though," he said one day to the government fish culturist, with whom he was working; "and that is, why we need to do this."

"How do you mean, Dare?"

"Well, in the West, they hatch young salmon because the old salmon are caught going up the river before they spawn, and they die, anyway; but here they have all the room they want for spawning, and I should think Nature would look after it."

"You don't want to forget," the fish culturist replied, "that Nature is very exact. Everything has to balance. The whitefish born are ten times as many as those that mature, but the number that matures is just precisely enough to keep the supply going."

"I see that, all right," the boy answered.

"Well, then, if you disturb this balance by extensive fishing, isn't it easy to see that you've got to make up for it somewhere? We don't have to worry over keeping up the supply of catfish, for

example, because Nature is being left alone, and she has worked the problem out. But if suddenly a big catfish market developed—as it easily might, because, in spite of popular opinion, catfish is good eating—and if thousands of them were caught, it would be necessary to find some way to help Nature in keeping up the supply.

"Now, the whitefish," he continued, "isn't like the salmon, which spawns carefully. The lake fish does that in a sort of hit-or-miss manner, with the result that only a small percentage of the eggs get a fair start. It is not difficult for us to put hundreds of millions of young fish into the lakes every year, and the proportion of these that survive will not merely keep the supply constant, but will even increase it."

"Then that will disturb the balance in another way?"

"Yes," was the reply, "but it will be at the expense of other species which are of no use to man. Nature is like the proverbial Irishman, she can't be drove, but she's mighty easy to lead. When you return to the university, get hold of some books on the means by which all the various kinds of living creatures in the world are kept on an even balance, how they all get their food, and how every tiny speck fits into the whole world scheme. You'll find that sort of reading has more grip to it than any novel—except, perhaps, those of a few of the really great writers, of whom there are some in every age."

Winter on the Great Lakes, Stripping Lake-Trout.

Courtesy of the U. S. Bureau of Fisheries.

Winter Work on Inland Streams, Planting Trout Fry in Ice-Covered Rivers.

Courtesy of the U. S. Bureau of Fisheries.

"I found that out," answered Colin, "when I was working with Mr. Collier. He was always saying that things were 'so much worth while,' and when he started to explain them, they certainly were! It's just like this, I've only seen a little bit of this inland water work, but you handle other species beside whitefish in this work on the Great Lakes, don't you?"

"Yes," was the culturist's reply; "lake trout and pike perch among others. One station alone has handled seventy-one million trout eggs in a season. But the pike perch is a more difficult fish to propagate artificially, though nearly half a million eggs were distributed last year. We gave Canada six million pike perch fry. There's no wasted energy in the Bureau of Fisheries, it's practical all the way through, and you're learning to see it from the right angle—doing the work and seeing the results."

It was this personal contact with the fish-culture work, this direct demonstration of the money value to the country of scientific knowledge, which became Colin's stimulus. His college-mates outdistanced him in many studies, for the boy was not at heart of a scholarly type, but in his scientific work he was far in advance of them all. Seeing his interest and his perseverance, several of the professors and instructors in the scientific department took a liking to Colin, and the lad was sure to be found on every kind of field expedition for which he was eligible. He was quite an athlete, too, but he settled down to swimming as his share in the athletic work of the university. Already quite at home in the water, he worked at improving his stroke with such energy, and was in the tank so much, that before the end of his freshman year, he was by long odds the best swimmer in the college. With his devotion to fish and his prowess in the water, it was a common saying that "Dare's growing fins!" and the college paper took to calling him "Fins," a nickname which stuck to him ever after.

As he had intimated to his father long before, Colin was especially anxious to go to Woods Hole, the great marine station of the Bureau of Fisheries, situated on the southwestern corner of Cape Cod, and the most famous marine biological laboratory in the New World. The work of the Fisheries appealed to him a great deal more when it bore a relation to the sea, rather than to rivers and inland waters, and his application for a position on the summer force at Woods Hole had been sent to headquarters shortly after the New Year. Accordingly, just as soon as the term was over, he hurried to Washington.

Disappointment awaited him. His heart had been set on that especial feature of the work, but when he asked Dr. Crafts about it, the Deputy Commissioner shook his head.

"I have thought the matter over," he said, "and if you are equally anxious next year to go to Woods Hole you shall go. But this season I'm going to send you to the Mississippi to do some work on mussels."

"Very well, sir," Colin answered, his expression betraying his regrets, but his will determining that he would make no seeming complaint. "I wish I'd known this winter, and I would have given more attention to the mollusks."

The Deputy Commissioner, who had friends in Brown University, had heard indirectly once or twice about Colin, and smiled to himself. He was pleased by the lad's self-control, and continued:

"The mussel question is of a great deal more interest than you think. I'm not sure, of course, but there are signs of a pearl-fever, and if there is one, you'll certainly see something doing. The Mississippi and Ohio were like a Klondike in 1903!"

"What is a 'pearl-fever,' Dr. Crafts?" asked the boy.

"A silly infatuation that seems to strike the farmers of the river valleys every few years on hearing that a valuable pearl has been found in a mussel. The get-rich-quick hope is very general, and it seems so much easier to dredge mussels and open them until a fortune is found in one than it does to farm for a living. In 1903, thousands upon thousands of farms were deserted or sold for next to nothing by people who believed that within a week they could be made millionaires by the pearls they would find in Mississippi River mussels."

"But I thought pearls came from oysters!" exclaimed Colin in surprise.

"So they do, but they come from mussels, as well, and clams occasionally. But you ought to remember," the Deputy Commissioner continued, "that the finding of an occasional pearl in an oyster or a mussel is of comparatively little importance, because it's an irregular sort of thing. The mother-of-pearl industry, however, is of big importance, it has an economic value to the country, and consequently it's our business to see that the natural resources are as wisely used as possible. We'll start a party out there on June fifteenth, so you can report here by that time."

"But, sir——"

"Well?"

"That's three weeks away!"

"Is that too long to wait? I'm afraid you'll have to learn patience, Colin; that's as important as any knowledge of fish culture."

"But I was wondering, Dr. Crafts," the boy urged, "if I had three weeks to spend, why I couldn't go down to Beaufort?"

"What for?"

"One of my instructors in biology is there," Colin said. "I believe the Bureau gave him table-room in the laboratory there for some work on turtles, and he said I could help him if you were willing to have me go. I didn't say anything about it, because I wanted to go to Woods Hole right away,

but if I have this time to spare, don't you think I ought to use it?"

"I think you ought to use it for a holiday," the Deputy Commissioner answered.

"But I'd rather be doing something!" protested Colin.

"Perhaps," was the firm reply; "but not necessarily at Beaufort. Aside from the hatching of diamond-back terrapin, there's nothing going on there in which you could be of any service. Besides, you'll get 'stale' unless you have a vacation. 'All work and no play,' you know."

Colin was eager to urge the Deputy Commissioner, but he could see it would be useless.

"I'd read up on turtles, too!" he returned in a disappointed tone.

"H'm—by your instructor you mean Mr. Lark, do you not?"

"Yes, sir."

"Look here, Colin," said the Deputy Commissioner, "since you have practically joined the Bureau by our promise to accept you if you make good, don't forget that we are after results first. I've been a boy myself, and I think I can see what you're driving at. I suppose Lark has been telling you some of his stories about riding diving turtles."

"Yes, Dr. Crafts," the boy replied; "he told me a lot about it."

"I thought so," was the reply. "I remember some magazine articles he did. And I suppose you thought you wanted to take a ride?"

"I'm a good swimmer, sir," Colin answered a little proudly.

"You mean you can swim," the Deputy Commissioner responded a little sharply, for being modest himself, he disliked any appearance of boasting.

"Yes, sir," the boy said; "that was what I meant."

"Well, there's no turtle-riding at Beaufort. If you knew a little more about these subjects, you wouldn't make such breaks, whether you have been reading up on them or not. The leather turtle, the big one on which men dive by holding on to the shell, is an aquatic species and never comes into brackish water. The terrapin lives in the mud, and is only to be found in marshy places. If you want to go turtle-riding for your vacation, why, go ahead, no one's going to stop you, but you can hardly do that while officially or even unofficially acting as an assistant at Beaufort. It's almost as far from Beaufort to the Florida Keys as it is from here to Hudson's Bay."

"I hadn't realized that, sir," Colin answered, surprised.

"Very few people do," was the reply. "Why, the State of Florida alone is as long as the distance from New York to Nova Scotia, or Washington to Detroit. You can't go after leather-turtle from Beaufort unless you've got—not seven-leagued boots, but seven-leagued fins."

"I'm sorry I bothered you about it, Dr. Crafts," the boy answered. "I really hadn't given the distances much thought."

"Wait a bit," said the Deputy Commissioner, as the boy turned to go. "I don't want you to feel badly about your summer. What do you know about mussels?"

"Very little, sir," the boy answered; "hardly anything."

"Let me tell you a story about them," the Deputy Commissioner said, smiling as the boy's face lighted up at the word "story." "Seven or eight centuries ago," his friend began—"that is, if you want to hear it?"

"Oh, yes, sir," came the reply.

"That's a long way back—a small trading-vessel was wrecked in the Bay of Biscay on the west coast of France, near the little village of Esnandes. All hands were lost except one sailor, an Irishman, called Walton."

"Sure to be an Irishman who got ashore," commented the boy.

"This was a particularly ingenious son of Erin," the other continued. "Although he did not speak a word of French, with the likeableness that seems to have been the chief note of the Irish character then, and which they have never lost, Walton speedily became popular in the little French village. This was the more remarkable, as there was a great scarcity of food in the village, the inhabitants depending entirely on fishing, and the fishing-grounds having become worked out. Hence the presence of a stranger for whom to provide food became a serious problem.

"But the Irish had not been the teachers and scholars of Europe during the five preceding centuries for nothing, and though Walton was but a sailor, he shared the quick-wittedness of his race. He had heard somewhere that people often starved in the midst of plenty, and he started exploring for food on his own account. The village was built near a wide stretch of mud, which was covered by the sea at high tide, but dry when the water went down, and he noticed that numbers of land- and sea-birds were in the habit of skimming over the mud at low tide, apparently picking up worms.

"Birds could be eaten, he thought. Accordingly, patching together all the old bits of net that could be found and mending the holes, the Irishman made a huge net two or three hundred yards long. Then he drove a number of stakes into the mud, working almost night and day, and stretched the net vertically about ten feet above the mud. The net was made something like a fish-trap, so that birds flying under would find it difficult to get out. On the very first night the net was spread, he caught enough birds to feed the village for a week."

"Bully for him!" cried Colin.

"That was only the beginning," the Deputy Commissioner continued. "The ingenious stranger now began to consider what food it was that attracted these birds, and to his surprise, instead of worms, found that they lived on an unknown black shellfish, now called mussels. If the birds ate mussels and the birds were good to eat, Walton reasoned that mussels must be fit for food. He ate some in order to find out."

"That's the real scientific spirit," said Colin, laughing.

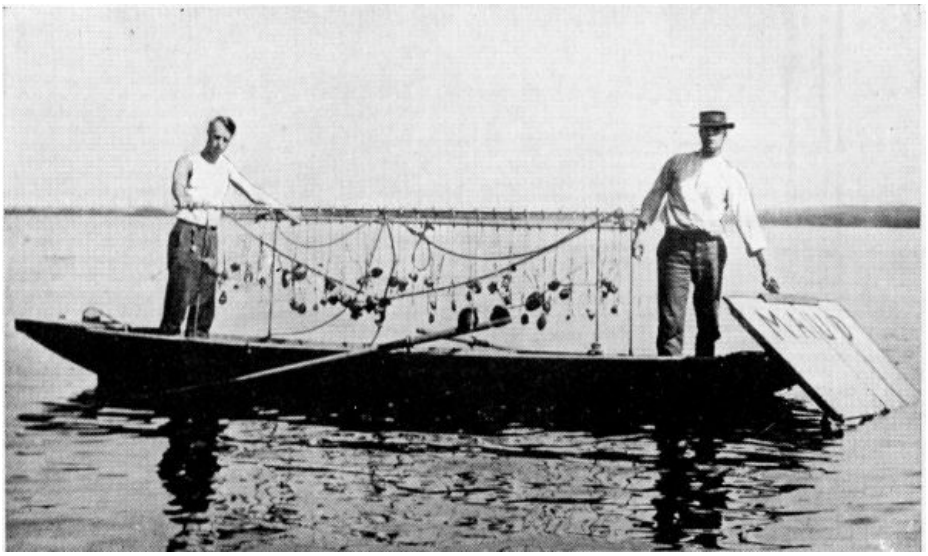
"He was Irish and willing to take a chance," was the smiling rejoinder. "However that may be, he not only found that they were good to eat, but that they were good eating. He had hard work to persuade the villagers to his point of view, although his success with the birds had made him a sort of hero. Soon, however, mussels came to be in great demand. Then Walton noticed that young mussels in great numbers were gathering on the submerged stakes of his net, and being prolific of ideas, he promptly had several hundred more stakes cut and driven into the mud. He found, then, that mussels thus suspended over the mud grew fatter and of better flavor, and accordingly designed frames with interlacing branches which collected them by hundreds. This system, known as the 'buchot' system, has been practiced continuously at the village of Esnandes during all the centuries since that time, and the income to the little village last year was over one hundred and twelve thousand dollars as a result of the ingenuity of the castaway Irishman."

"Then mussels are fit for food," Colin said in surprise. "I thought they were only used for bait."

"Mussels, sea-mussels that is, are as good a food as clams,—some people claim that they are better,—and they have just about three times as much food value as the oyster. That's why I told you the story. We expect to make the mussel industry as important as the clam fishery, giving employment to thousands of people and establishing what is practically a new food supply in the United States, although it is common throughout the shore countries of Europe."

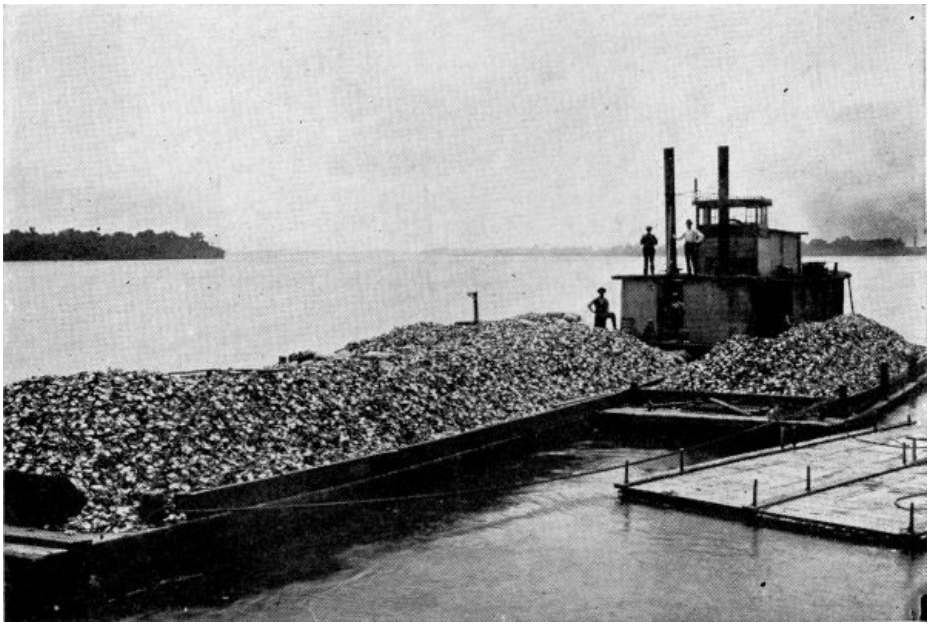
"But the pearl mussels," queried Colin, "can you eat those, too?"

"It is doubtful," was the reply, "but their value lies so largely in their use for mother-of-pearl in the button industry, that their food value would be of only secondary importance, unless they could be pickled or canned, as is done sometimes with the sea-mussels. But, Colin," he added, "if you think that the mussel doesn't sound an interesting subject, let me tell you that I think it is, in itself, one of the most interesting creatures in the water. Its life history is astounding, and there are scores of problems yet to be worked out. Read this," he added, handing the lad a Bulletin of the Bureau; "it has only just come out, and if I have judged you rightly, you'll come here on June fifteenth so eager to get to a mussel-bed that there will be no holding you!"



Clamming on the Mississippi.

Courtesy of the U. S. Bureau of Fisheries.



Barge-Loads of Mussels for the Mother-of-Pearl Industry.

Courtesy of the U. S. Bureau of Fisheries.

Two hours later, the Deputy Commissioner, leaving the office for the day, started on his walk home, going through the park in the direction of the Smithsonian Museum. On his way he was surprised to see Colin sitting on a bench near the Fisheries Building, absolutely engrossed in a gray, paper-covered folio. Dr. Crafts recognized it as the Bulletin he had given the lad early in the afternoon, and he laughed aloud at the boyish impatience which had made it impossible for Colin even to wait until he got the book home. The Deputy Commissioner had to speak twice before he was heard.

"Well, Colin," he said, "are you learning it off by heart?"

The boy jumped up as soon as he saw his friend, fairly stuttering with all the questions he wanted to ask.

"I've got to go home," the Deputy Commissioner said, when Colin stopped to take breath; "and you've put queries enough to keep a staff of men answering for a week! Didn't I tell you that there's a world of work to be done over the mussel? But if you like to walk along, why, I'll tell you anything I can."

"Thanks, ever so much," the boy said; "but what puzzles me in this Bulletin is the mussel's marsupium, or pouch. Has a fresh-water mussel really got a pouch like a kangaroo?"

The Deputy Commissioner pushed his hat back over his forehead.

"Colin," he said, "you have a knack of putting questions in the most awkward fashion. I suppose, in a way, the answer is 'not quite,' because in the kangaroo, the baby is almost completely formed when it is placed in the pouch, while in the mussel, only the egg goes there. The word 'marsupium' was what threw you off. What really happens is that the egg passes into this pouch or pocket in the gills, and is there fertilized as the current of water flows in and out over the gills."

"And it stays there until it has a shell of its own, doesn't it?" asked the boy.

"It does," was the reply.

"Well," said the eager questioner, "if it has a shell and is able to look out for itself, why doesn't it? Yet the book says that it always attacks a fish and lives as a parasite for a while."

"It doesn't attack a fish, Colin," the other answered; "it only fastens on to one. Besides which, although the mussel has a shell, it isn't able to look out for itself. There is a change of form while it is fastened to the fish."

"But doesn't it hurt the fish?"

"Not permanently. It causes a local sore or a cyst, like the tiniest kind of a blister, in the middle of which the larva of the mussel is safely curled up and stays there until fully developed. Then the cyst breaks, the mussel drops out, and the tiny wound heals rapidly. Even a small fish, four inches in length, can carry five hundred of these little creatures on its fins and in its gills without serious injury."

"Suppose it can't find a fish?"

"That's the end of the mussel, then! There is one kind of mussel that develops without going through the parasite stage, but it is not as common as the others. Curiously enough, the only way to raise the mussel artificially is by means of parasitism on the fish. As you read there, it is a simple matter to get these tiny creatures from the 'pouch' of the mother mussel, put them in an

aquarium with some fish, and keep the water stirred up. In a few minutes the larvæ will have fastened themselves on. It is wise to keep these fish in a hatchery for a month or so and then simply release them; when the mussels are ready they will drop off, and a new crop of mussels is on the way. By this means you can start them without much trouble in rivers and streams where there were none before, so that you see what chances there are for the development of the industry."

"Are all mussels equally good for making mother-of-pearl?"

"No," was the reply. "There are two chief commercial varieties, of different species, one larva having a hook on the shell, so that it can attach to fins or tail, the other being smaller and without hooks and making its way into the gills. But you'll go into all that when you get to Fairport, and even after you have worked at mussels all summer there will be a lot of problems you won't have touched. Don't forget now, the fifteenth."

"Never fear, Dr. Crafts," Colin answered; "I won't forget. I wish it were here now."

Time did not hang heavily on the boy's hands, for he was interested in all phases of fishing, and spent a couple of weeks on a trout stream in Northern Maine, not only catching the fish, but—as he had been advised—making notes of any peculiarities he saw in those he caught. Many stories had been told him of the finding of new species by young investigators, and he was amazed to see what wide differences existed in fish of the same species.

Colin examined so carefully every one he caught, that he began to think that if the fish were thrown back into the stream and hooked out again, he could recognize each one of them. His eagerness to be at work reached boiling point when a newspaper arrived at the camp with a brief item telling of the excitement caused by the finding of pearls near Fairport. Fortunately, it was only a day or two before the date set for his departure, and Colin was on the point of starting for Washington, when he received a letter ordering him to his post on the Mississippi immediately. He took the next train, and reported two days later at the hatchery.

"Are you coming for any special line of work?" the superintendent asked him. "I was informed from Washington that you were coming, but nothing was said as to the nature of your duties."

"Nothing more than that Dr. Crafts said I should probably be working on mussels, sir," the boy answered. "I was just told to report."

"The Deputy Commissioner states," the superintendent continued, looking over the letter, "that you expect to join the Bureau permanently, and that you have been doing some work at college on fishes."

"I haven't done very much, as yet, sir."

"I suppose not. But I want to find out what you know about mussels."

This put the boy on his mettle.

Colin told briefly, but quite clearly, what he remembered of the life-history of the fresh-water mussel as described in the Bulletin that had been given him, and added the information he had secured from the Deputy Commissioner. The superintendent of the station put a few leading questions to him, and nodded his head with satisfaction.

"So far as theory goes," he said, "I think you have a fairly good idea of it, although here and there you made some statements showing the need of a good deal of practical work with mussels. But, since you seem to have a general idea of the anatomy and physiology, I think I will put you in as Dr. Edelstein's assistant."

"What is he doing, sir?" queried Colin.

"He is working on pearl formations," was the answer. "You have heard, I suppose, that there has been some excitement over pearl finds?"

"Yes, I heard that away up in Maine," the boy replied.

"It's exaggerated a good deal," the superintendent said; "but as a matter of fact, there have been a few good finds. Dr. Edelstein is studying the differences between oyster and mussel pearls. Of course, when one of these 'rushes' comes, a very large number of inferior pearls are found, which are of no commercial value but which afford good material to work on. Just now," he added, "I think it is the most interesting part of the work. Come along, and I'll introduce you to Dr. Edelstein."

Colin's new chief was an entirely different type from any of the scientists whom he had met in the Bureau. In the first place, he was a gem expert by profession, and consequently, more of a mineralogist than biologist. Tall, powerfully built, black-bearded, and abrupt, he gave an impression of volcanic force, and at the same time of great keenness. A scientist of remarkable discernment, he possessed with all his broad views a marvelous capacity for detail, and Colin soon learned that the somewhat slipshod methods of a college laboratory would not be accepted by Dr. Edelstein.

"It iss of no use to think that a result iss right!" he said, when Colin betrayed a hint of impatience at performing the same experiment over and over again, scores of times. "It iss to know for certainly, that we work."

"I really believe, Dr. Edelstein," Colin said, "that you would like to see this fail once or twice."

"Of gourse! Then we find out why it iss a failure. That iss a good way to learn."

But in spite of the strictness of the discipline under which he was kept by his chief, Colin enjoyed the work. His duties were manifold. Some days he would spend entirely in the laboratory preparing microscope slides or observing mussel parasites through the microscopes, and making copious notes. His power as a colorist stood him in good stead again, and more than once he received a rare word of praise, feeling quite elated when, one day, late in the summer, Dr. Edelstein said to him:

"I have much gonfidence in your golor sense, Golin."

At the same station, one of the younger men was finishing a monograph on the spoonbill-cat, a sturgeon of the lower Mississippi, often six feet in length and a hundred pounds in weight, just coming into commercial importance as the source of caviare. The 'paddle-fish,' as the creature is often called by the negroes, because of its long paddle-shaped jaw, or 'nose,' formed an interesting study to Colin, for he knew enough about the make-up of fishes to realize that this was a very ancient form, midway between the sharks and the true bony fishes. The paddle-fish is closely allied to the sturgeon, and its roe has recently been found to be almost as good for caviare as the Russian variety. Thus, within ten years, a new fishing industry has developed on the Mississippi River.

In addition to his laboratory work and to his share in the investigations of his friend who was studying the paddle-fish, Colin frequently took short trips up or down the river for Dr. Edelstein, the latter being anxious to procure measurements and other data on every pearl found. It was on one of these trips that Colin had the opportunity of seeing the panicky side of a 'pearl fever,' of which he had heard so much. The report had come to the station that a pearl of fair size, valued at about five hundred dollars, had been found, four miles below the station, and Colin was told to go down and make a report on it as soon as he had finished his afternoon's work. Accordingly, after supper, he took a small power-boat and ran downstream, taking with him a very sensitive pair of scales to determine the exact weight of the pearl, calipers to ascertain its size, and other instruments especially designed by Dr. Edelstein. At the same time, he was ordered to secure the shell from which the pearl had been taken, should it be obtainable.

The pearl was measured carefully and found to be a fine one, not large and not unusual in any way, though a certain irregularity in the position of its formation on the shell gave it a scientific interest. The lucky finder was entirely willing to yield up the shell of the mussel from which the pearl had been taken, and was glad to be informed as to its weight and purity. It was pleasant to Colin to see—as he so often did—the success of the pearl-hunters. But while the boy was examining the stone, a loud knock at the door, was heard, and a neighbor came in, breathless and excited.

Landing the Paddlefish.
New industry developed in the lower Mississippi, catching sturgeon-like fish for its roe.
By permission of Dr. Louis Hussakoff.

"I've got one," he cried. "I've got a big one!"

Every one present crowded round with cries of congratulation.

Slowly the newcomer opened his hand and revealed a large pearl almost twice the size of the gem Colin had been examining, and, therefore, if of equal purity, worth eight times as much. The finder handed it around, and in course of time it reached the boy, who scrutinized it carefully.

"Isn't it a beauty?" the newcomer cried. "And just on the very last day! I haven't a penny left in the world, and I sold my old farm to come up here. It's been getting harder and harder for me every day, and we had decided to give it all up. I hadn't a bit of hope left, and now——!"

The cottager whose pearl Colin had come down to inspect, slapped the farmer on the back, and without a trace of enviousness—for he himself had been lucky—joined in his delight. The farmer's wife had followed him more sedately, and she came in to share the general enthusiasm.

But Colin sat silent.

Over and over again, with a childish persistence, the farmer told how he had sold his farm, how he had come up with every penny he owned, how, little by little, it had all oozed away, and how in disgust he had decided to sell his boat, which would give him just enough money to get back to Missouri.

"But now, Mary," he said, "we can go back and get a better farm than we ever had, and we'll have a house in the village so that the children can go to a good school, and you'll have lots o' friends, and pretty things about you. It's been hard, neighbors, I tell you," he said, looking round; "but the luck has turned at last."

Colin said not a word, but kept his eyes fixed on the table. His host, the mussel-gatherer, whose stone he had been examining, noticed this, but the newcomer was boisterous in his joy. He babbled of the wealth that was his, until if the stone had been a diamond of equal size, it would not have sufficed to have financed his dreams.

But the boy with the instruments on the table before him, said not a word of congratulation or delight. He had only seen the pearl for a moment, but he knew.

With hearty and jovial hospitality, the farmer invited every one in the room to come and stay with him as soon as he was settled down. He would show them, he said, what real life was like on a farm.

Suddenly he stopped.

"Mister!" he said, in an altered voice.

Colin, sitting alone, still beside his testing instruments, did not look up.

"Mister!" he said again.

In spite of himself the boy raised his eyes. Do what he might, he could not keep the sorrow out of them, and those of the finder of the pearl met his fairly.

The room was full of people but it grew still as death.

The woman clasped her husband's arm and gave a low moan. He touched her shoulder gently.

"Mister," he said again, with a humbleness that seemed strangely gentle after all his bluster and brag, "will you look at this and tell me what you think it's worth?"

"I'm not an expert," the boy said hastily. "I couldn't judge its value. You ought to take it to some one that knows all about these things."

"I can see what you think," the farmer said with a pitiful, sad smile; "you think it isn't worth much. Is it worth anything at all?"

Colin took the discolored pearl and looked at it closely. He put it on the scales and weighed it carefully, measured it, and scrutinized it as closely as he could in the lamplight, but he knew himself that these were devices to gain time. The pearl showed all too clearly a flaw that would make it valueless. Every one waited for his verdict. He was conscious that his voice was a little shaky, but he answered as steadily as he could:

"I'm afraid, sir——"

"Well?"

"I don't believe, sir——"

"That it's worth anything at all?" the farmer interrupted.

A solemn dignity, the accompaniment of great trouble, came to the man's aid and gave him strength. "Thank you," he said; "I understand."

He looked around with a troubled glance and saw the far smaller but more valuable pearl that his neighbor had found, which was still lying on the table beside the instruments. A strong shiver shook him, but he made no other sign. He turned to Colin.

"I see that it's no good," he said, "but I shall keep it just the same. If you have finished with it——"

Colin stood up and placed the pearl in his hand.

"Please take it to some one else right away," he said. "I couldn't sleep—suppose I were wrong!"

The old farmer looked at him gravely.

"No man would do as you have done and say what you have said, unless it was so clear that he couldn't help but know," he replied. He turned to the neighbors. "I'm afraid," he said, "I have in part spoiled your pleasure, and," he added, with a twitch of the muscles of his face, "made a fool of myself, besides. Come, Mary, we'll go home."

The others pressed forward with words of sympathy, but the stricken man paid no heed and passed out of the door. Colin sat heavily back in his chair staring moodily at the instruments, his heart sore within him, but he knew he could have done nothing else. Yet the thought of the old farmer's sorrow was powerfully before him, and he had to keep a strong grip on himself to keep from showing an unmanly emotion.

Outside the little cottage could be heard a murmur of voices, as the old farmer tried to comfort his wife, while inside the house no one spoke lest he should seem careless of the grief and disappointment of those who were still within hearing. Suddenly a third voice was heard outside, speaking excitedly. Once again that tense clutch of suppressed emotion permeated the room and Colin, with his heart in his mouth, looked up. No one moved. Outside the voices ceased.

Then, through the open door, rushed a boy about twelve years old, muddy from head to foot, but with his two eyes shining like lights from his grimy face. The mussel-gatherer recognized instantly the farmer's son.

"What is it, John?" he asked.

"I was goin' over some shells father hadn' opened, after he'd found that other pearl, an' I got this! Father he says the other one's no good an' that this isn' likely to be any better! But I don' know!

It looks all right!"

He glanced down at the object in his hand.

"Father said it was no good," he repeated, a little less certainly; "but I don' know."

He held out his hand and passed the pearl to the mussel-gatherer, who glanced at it hastily.

"Mr. Dare!" he said excitedly.

Colin looked up and caught his glance, then tried to take the stone. But his hand shook as though he were in a violent fever, and the mussel-gatherer placed it on the table beside his own, in front of the boy. Clear, flawless, and of fair size, it gleamed like a star of hope before them all. A moment's examination was enough. Leaping from his seat Colin seized the pearl and rushed out of the door.

"It's real, sir; it's real!" he cried. "And will do all you said!"

The old farmer never looked at him. He turned his face toward the stars and reverently removed his hat.

CHAPTER IX

A TUSSLE WITH THE MONARCH OF THE SEA

In spite of his interest in the pearl work, Colin began to feel the strain of the steady and persistent grind required from him by Dr. Edelstein, who himself seemed absolutely untiring. At the beginning of July, moreover, the weather turned wet, and the rain poured down steadily, not heavily, but soaking the ground thoroughly. For a week or so no notice was taken of the rain, other than the discomfort it caused, but one day Colin overheard one of the head workers saying to the superintendent:

"It looks as though we might have trouble unless there's a let-up to the rain soon!"

"I'm afraid of it," was the reply, and the grave tone of the answer surprised Colin; "and I hear that it's raining in torrents in Montana."

"We're safe enough, I suppose," was the comment.

"Yes," the superintendent answered, "but hundreds of other people are not. Floods always catch some of them."

This was an idea that had not occurred to Colin. The word "flood" called up a host of graphic ideas, and a flood on the Mississippi, the largest river in the world flowing through a populated country, seemed a serious matter. He spoke of it to his friend of the paddlefish investigation.

"Yes," the other answered, "there have been many scores of lives lost and many millions of dollars swept away on the 'Father of Waters,' and I doubt if the time will ever come when the flood danger will be at an end. Remember that the Mississippi River Valley is the only water outlet for two-thirds of the entire United States."

"It's protected by levees, too, isn't it?" Colin queried. "At least, during the flood on the Mississippi, you always hear of the levees breaking or just going to break."

"They give way very seldom now," his chief replied, "and that means wonderful engineering, for there are sixteen hundred miles of levee, the river banks being built up clear from Illinois to the Gulf."

"Then where are the floods one hears of so often?"

"There are bad floods on the Ohio," was the reply, "and there is always danger when a flood tide comes down the Mississippi. You see, if part of a levee does give way, or as they say, if a 'crevasse' comes, thousands of square miles are inundated, hundreds of people made homeless, and the property loss is incalculable. All the land around the lower part of the Mississippi is just a flood plain which used to be covered with water every year. That land has been rescued from the river just as Holland has been rescued from the sea."

"Then there is danger every year?"

"There is always danger," was the reply, "and the levees are carefully patrolled. But during the high water of early summer there is more danger, and a week's rain means trouble. We're going to have a bad flood this year unless the rain stops soon."

"But the river isn't rising?"

"Not yet. Why should it? It isn't the water that flows directly into the Mississippi, but that which floods the tributaries that causes disaster. From the Rocky Mountains on the one side to the Alleghanies on the other, and from the Gulf of Mexico to Canada—nearly every drop of rain that isn't evaporated or used by plants has to be carried to the sea by the Mississippi."

"It seems like a big job for one river bed," Colin agreed. "But how can it be made safer?"

"The way is easy," was the answer, "but costly. If big reservoirs are built on all the headwater streams so that—no matter what the rainfall may be—only a constant amount is allowed to flow out of these reservoirs, then floods will be avoided, there will be plenty of water for irrigation, and a steady depth of water in the channel will extend navigation that is now stopped during low-water periods. Besides which, it will make the Mississippi fish question a great deal easier."

"I don't quite see what it has to do with the fish!" the boy said.

"Supposing five thousand square miles of land are flooded. When the water goes down, at least half that amount of land is still flooded, though no longer connected with the river, but forming shallow lakes and pools. These are all full of fish. As the pools dry up, everything that is in them dies, and millions of food fish are lost."

"But how can we stop that?"

"The Bureau of Fisheries does a great deal to stop it," was the answer, "and if this rain holds—though we are all praying that it won't—you'll probably have a chance to see. The Bureau seines as many as it can of those bayous and pools and lakes to save the fish and return them to the river. If a couple of men can save several thousand fish a day, isn't that worth while? Think of a farmer who could get a thousand bushels of wheat in a day! And that's about the proportion of food value."

"Well," said Colin, as he was leaving the laboratory to take up another piece of work he had been told to do, "I don't want a flood to come, of course, but if there is one, I'd like to have a chance to see how the Bureau handles that sort of fish rescue work."

The reports the next morning were no more encouraging,—the Weather Bureau reporting heavy rain in Montana and the Milk River in flood. Fortunately the weather was fine in the eastern States, but a flood on the Milk River usually means a Missouri River flood, and that takes in nearly two-fifths of the Mississippi basin. Around the Iowa station the rain still poured heavily. By the end of the week more hopeful reports came from the west. As the southwest had escaped entirely no serious trouble was expected, but in the region near the laboratory the rain was coming down in torrents and the Wapsipinicon and Cedar Rivers were overflowing their banks.

Climbing up the Wheel.
Device used on the lower Mississippi to haul in big nets for the Spoonbills.
By permission of Dr. Louis Hussakoff.

Biggest Fresh-Water Fish in America.

Pulling out the source of domestic caviare, the Spoonbill.

By permission of Dr. Louis Hussakoff.

The neighboring stations at Bellevue, Iowa, and North MacGregor, Iowa, were reported to be preparing for collecting black bass, crappies, sun-fishes, yellow perch, pike, buffalo-fish, and catfish as soon as the water should recede and leave the fish stranded in lakes and pools. One Sunday, Colin took the power-boat up the river and had a chat with the men at Bellevue regarding the nature of the work. He found that the flood dangers were small above the junction of the Missouri and Mississippi Rivers, and when an opportunity arrived to do some fish collection in the overflows, the boy thanked the superintendent of the station, and said he would rather keep to the mussel work. This, a day or two later, came to the notice of Dr. Edelstein.

"I haf observed," his chief said, "that you haf been taking much more interest lately in your work. Why is it?"

"I have been trying to do a little investigating on my own account," Colin said confusedly, "and there's a lot of fun in working things out all by yourself."

"Haf you any objegtions to telling me what you haf been gonsidering?"

"Not at all, sir," Colin answered. "I'd be glad to show you, if you'd care to see. I've been trying to find out the cause of the difference in the secretions of the mussels that have very bright pearly shells and those that are dull. But I haven't got very far along yet."

"Fery good subject," was the reply; "let me see your notebooks."

Colin brought him a number of small notebooks filled with records of experiments that he had been doing in the evenings, and over some of them the gem expert smiled.

"You haf done a great deal of unnecessary work," he said, "work that I gould haf told you had no bearing on the results, but it isn't time wasted at all, for you will haf learned more that way than if I had told you. And you haf two series of eggsperiments that are very useful. If you only had time to make the series gomplete, the information would be of value to the Bureau."

"Would you include them in your report, sir, if I completed the series?"

His chief leaned back in his chair.

"Seriously," he said, "I think your eggsperiments on the garacter of the secretions are very interesting. You don't know as much organic gemistry as you should, but if you will take a few suggestions from me, I think your work would be worth publigation."

"You mean in your article?" asked Colin.

"No," was the answer, "in your own."

"My article! You mean that I should write it up?"

"Why not?"

"But I don't know enough!"

"If we all waited until we thought we knew enough about a subject," the scientist answered, "there never yet would haf been a line written. Don't gif any opinions, Golin, for they will not be worth much, nor any gonglusions, because you hafn't reached any. But make a simple statement of what was the problem you had, how you went about it, and the results of your eggsperiments so far. Remember, too," he added, "that a negative result is often of just as much value as a

positive, for it solves the problem to the eggstent of eliminating that partigular fagtor."

"And you really think I should write it up, Dr. Edelstein?"

"Of gourse."

"But would the Bureau take it?"

"That is for the Gommissioner to say, and he would decide on its merits. If it is not too long—just two or three pages, perhaps, I feel sure he would aggsept it. If you like I will go over the manuscript and advise you about it."

"Would you really do that for me?" asked Colin.

"Very gladly," was the reply; "but you will need a series almost twice as large as you haf now in order to make it of any value."

"Indeed I'll complete the series, Dr. Edelstein," Colin said. "I'll work at it every minute of spare time I can get."

From that moment time seemed to Colin all too short—the days appeared to fly. He was up long before breakfast getting out specimens both for himself and his chief and till late in the evening he would sit over his microscope working out the details of his experiments. The expert, who had realized earlier in the summer that Colin was restless, now saw that the reason was that none of the work he had been given to do possessed an individual note, and perceiving—as did every one—the enthusiastic nature of the lad, he helped him in every way possible. Thus it came about that before the day set for the reopening of college, Colin had finished the series of experiments which had been thought necessary, and had sent the manuscript of his article to Washington. And in the very first batch of letters that he received on his arrival at college was one from the Commissioner accepting his report and promising publication in the Bulletin.

Colin ever afterward declared that this was a great stimulus during his college work. He had done well the first year, but his late training under Dr. Edelstein and the spur of research had taught him how to concentrate upon his studies. He did not neglect the out-of-doors life, however, and he still had the swimming championship to defend, but every minute that he was not actively at play he was hard at work. Idle minutes were scarce. Nor did he fail of his reward. Just before the spring examination he received a letter from the Bureau of Fisheries telling him that his application for the next summer had been accepted and assigning him to duty at Woods Hole, the station where he had long desired to be.

Immediately after the close of the college year, and a few weeks spent at home, Colin betook himself to Washington, where he received the necessary credentials. As still a week intervened before the time of the opening of the laboratory, he spent several days in New York, visiting the American Museum daily and assisting his friend, Mr. Collier, with whom he had gone to Bermuda. The sea-garden exhibits were all completed and were among the museum's most popular cases, and the curator was engaged in preparing some exquisite models of the Radiolaria, those magical creatures of the sea, which are so small that they can be seen only with a powerful microscope, but which look like living snow-crystals, although a thousand times more beautiful. Some were already installed in the museum, but a large series was planned.

On his arrival at Woods Hole, Colin found work in the hatchery division of the station almost at an end. Hundreds of millions of cod, pollock, haddock, and flatfish fry had been hatched from eggs and planted in favorable places for their further development, and tens of millions of lobster fry as well. A few of the hatching troughs were in use, but most of them had been emptied and prepared for the work of the biological department of the Bureau, to which the station was given over during the summer months.

Colin found that he was not unknown to the director, who, being especially interested in mollusks, had read the lad's paper on the mussel-shells. Accordingly he was quite heartily welcomed and set right at work.

"You will take charge of the fish-trap crew, Dare," he was informed, the director's quick, snappy eye taking in the lad. "I suppose you know enough about fish to tell the various species apart?"

"I'm not sure, sir," said the boy, "but I think I know most of the common kinds. That is, theoretically, Mr. Prelatt, through studying them. I have never done any fishing of consequence off the New England coast."

"You can haul the trap at slack water this afternoon," the director said. "I will ask Mr. Wadreds to go with you. He knows every kind of fish that swims and more about each one than three or four of the rest of us put together."

"What will be my duties, sir?" asked Colin. "I don't want to trouble you, but if I am to take charge of the crew I ought to know what I have to do."

"The trap is to be hauled daily," was the reply, "except when the water is very rough. You will be given a list of the needs of the laboratory for experimental purposes, and as far as possible, you will fill those needs. Sometimes you may have to assist in the collecting trip besides, as for green sea-urchins and the like; or perhaps you may have to draw a seine for silversides and small fish. Sometimes you may be needed to haul some of the lobster pots, because we shall have two men at least doing research work on lobsters. Again, you may have to get mussels for some work that

is being done on shellfish for food. There will be two other students working with you in maintaining the supply of specimen material, under the direction of the head collector."

"Very well, Mr. Prelatt," the boy replied, "I'll see that things are kept up as far as possible. Am I to come to you for information as to where to go for special fish and so forth?"

"Mr. Wadreds knows more about that than I do," the director said; "he can usually tell you just where to find anything you're after. You'll soon find it easy, because collecting narrows down to a few species. The M. B. L. boat does collecting, too, and sometimes each party is able to help the other."

"What is the M. B. L., sir?" asked Colin.

"The Marine Biological Laboratory," was the reply, "which owns all the land on the other side of the street, just as we do on this. It is a summer college supported by a number of leading universities, to which graduate students come for courses in biology and marine life. There is some research work done also, and at the present moment Professor Jacques Loeb is doing some wonderful work over there on fish hybridization. We are entirely distinct organizations, one being a summer school and the other being a government marine hatchery with a biological laboratory attached. They have their own boats and we have ours, but we grant them the privilege of using our wharves, and there is a great deal of friendly cooperation between the two."

"You spoke of sea-mussels, sir," suggested Colin.

"Well?"

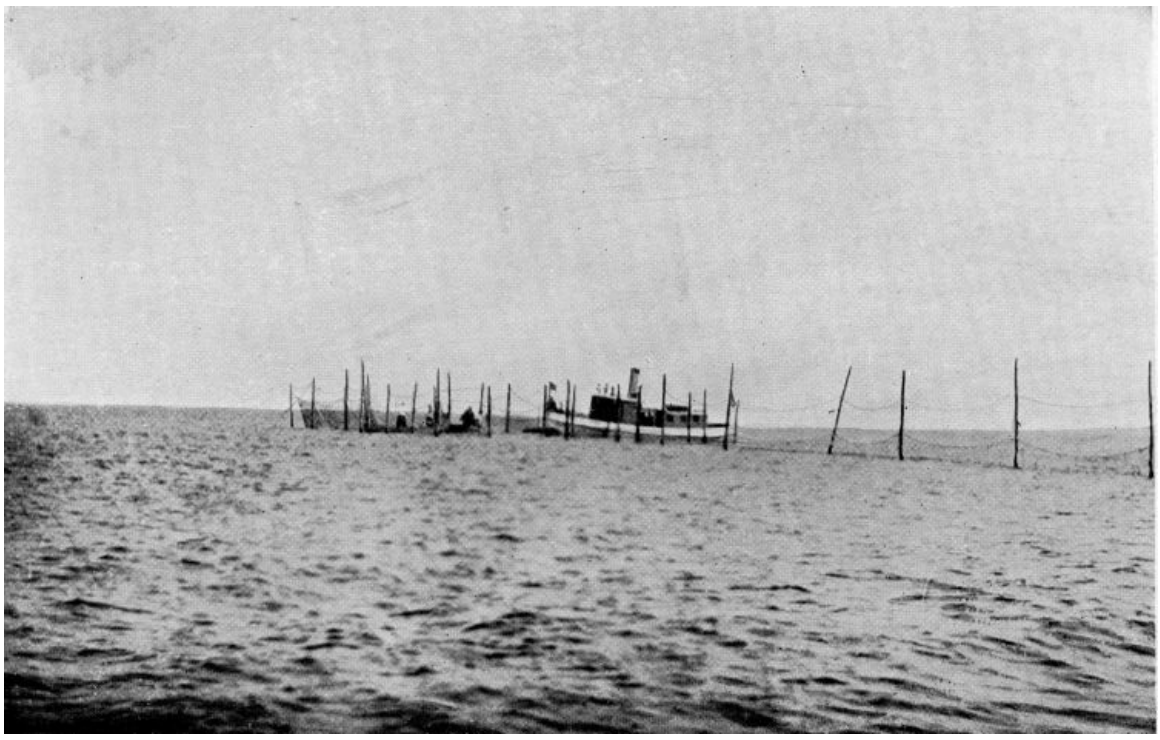
"I was wondering, Mr. Prelatt, whether I would have any time aside from the fish-traps and the collecting, and if so, if I might work with the man who is going to take that up."

The director shook his head.

"No," he answered, "there are two men working on that subject together. Besides which, you will have but very little time, at least for a couple of weeks. Then, if you feel that you would like some research work, I'll tell you what I want done."

Colin soon found that the demands upon him by the chief of the collecting staff not only were very heavy, but that they required considerable ingenuity. Frequently he would be asked for starfish and it would be necessary to go to a well-known shoal at some little distance, perhaps in the *Phalarope* or other of the government boats. There they would dredge with 'tangles,' a tangle being an iron frame with yards and yards of cotton waste dragging behind in which the spines of sea-urchins and the rough convolutions of starfish easily become entangled. Occasionally more distant trips, such as those to the Gulf Stream, would be made on the *Fish Hawk*, the largest of the Bureau's boats, named like all the others, after sea birds.

The hauling of the fish-trap, usually done in boats from the *Blue Wing*, never palled in interest. Every day the visit to the trap had the expectant thrill the miner finds when prospecting in a new stream. There was always the excitement of possibly finding new species, true gold to the scientist.



The *Blue Wing* at the Government Fish Trap, Woods Hole.

Photograph by C. R. W.

"I've found at least three new species," said Mr. Wadreds to him one day, "right out of the same

trap you're haulin'. And sometimes, when there has been a long-continued storm and the wind's settin' in from the southeast, the traps have jest had numbers o' tropical fish."

"Why should the wind bring the fish?" asked Colin.

"They come up with the weed, lad," was the old collector's reply. "When a storm rises the big masses o' gulf weed are broken up an' drift on the surface before the wind. A great many semi-tropical fish live on the weed an' the little creatures that make their homes in it, an' so they come followin' it away up here. Then we find them in the traps and by seinin'. We've caught butterfly fish an' parrot fish in the seines up here several times."

"We get menhaden in the trap principally now," the boy said; "why aren't they used for food? They look all right. Are they poisonous, or something?"

"Oily," was the reply; "an Eskimo might like 'em, but no one else. But the menhaden fishery is valuable just the same, for there's more oil and better oil got every year from menhaden than there is whale oil. Nearly all fish manure is menhaden, too. But they're not a food fish."

"Nor are dogfish," said Colin, "but I see that the M. B. L. mess table has them once in a while. We get lots of mackerel and other varieties that are good eating. I wonder why they eat dogfish?"

"Partly to try it out," the collector said. "A dogfish is a shark, as you know, and mos' people don't like the idea of eatin' any kind o' shark. But it is a waste to have a good article o' food entirely neglected by the public an' so the Bureau and the M. B. L. have tried usin' dogfish on the table as an experiment to get an idea of its value as food."

"It tastes all right, too," said the boy. "I had some yesterday."

"O' course it does, but the name is against it. Both dogfish and catfish are good eatin', but there is a prejudice against 'em, because people don't eat cats an' dogs. But they have been canned an' sold under various names, such as 'ocean whitefish,' 'Japanese halibut,' an' 'sea bass.'"

"They have a vicious look, though!"

"They are vicious," was the reply, "but you mustn't believe all you hear. Why, at the last International Fishery Congress a speaker told of a plague o' dogfish which not only attacked lobsters, but swallowed pots an' all."

Colin looked incredulously at his friend.

"That's the story," the other said; "you don't have to believe it. I don't."

"But after all, a dogfish is a shark, and aren't sharks the most vicious creatures o' the sea?"

"I shouldn't say so," the old collector answered. "I reckon the moray is really more vicious. He's always huntin' trouble. A shark is always hungry, that's all. Fishes have different kinds o' tempers, you know, an' often it's the smallest creature that's the meanest."

"Common fishes?"

"There isn't anythin' that swims that's meaner than a 'mad-Tom,' an' they're frequent in all the rivers o' the middle west an' south. A 'mad-Tom,'" he continued in answer to the boy's questioning look, "is a small catfish with spines. Most boys in riverside villages have their hands all cut up by 'mad-Toms.' O' course there are scorpion-fish an' toad-fishes in tropical waters, an' their poison will cripple a man for a while, but there's no fish that's fatal."

"I thought there were lots of poisonous things in the water," Colin said, "jellyfish and other things like that."

"Well," replied the collector, "a jellyfish can be tolerable poisonous. The Portuguese man-o'-war, pretty enough to look at when it floats on the water, with long streamers o' purple threads flowin' out behind, is the only thing that I ever heard of that killed a man."

"A jellyfish? How?"

"It was all his own fault," was the reply. "It was down in the Bahamas, off Nassau, as I remember. The sea was just alive with jellyfish, an' this young fellow that I'm tellin' about, he swam around a good deal an' once or twice had run into a jellyfish without gettin' stung. There's only some o' them that sting."

"I thought all of them did a little?"

"No, only a few. Well, this chap knew enough, I reckon, to keep away from a Portuguese man-o'-war usually, but either he had got reckless or didn't think of it. Some of his friends shouted out to him to take care, but he laughed back, tellin' them they were foolish to believe old stories, and to show that he didn't care, in a spirit o' 'dare' he dived plumb under the jellyfish. But he misjudged his distance an' came up clean in the middle of it an' the stingin' hairs just closed all over on him."

"There are hundreds of them, too, aren't there?"

"Thousands of stingin' filaments in some o' them. He gave one wild scream an' went down. When he came up and his friends were able to grasp him he was paralyzed as though he had suffered

an electric shock, an' before they could get him to shore his body had broken out in a violent rash. The doctors couldn't do anythin' for him an' he died three days later."

"Have you ever been stung?"

"I know enough to keep away from a jellyfish," was the blunt rejoinder; "but I had a nasty time with a torpedo once."

"The electric ray?" queried Colin. "That fish that looks like a small sea vampire only it hasn't a whip-like tail?"

"That's it," said the older man. "It was when I was just a youngster, I was haulin' in a net, when my feet slipped from under an' I went headlong into the middle o' the net, and a torpedo landed on the back o' my neck. I reckon he must have shocked the spinal cord or something because I was fair paralyzed for an hour or two. You're sure to get one yourself," he continued, "because they use torpedoes for research work a good deal, but a shock in the hand or on the arm passes away in a few minutes, so that you don't need to worry about that. The electric eels—which are not eels at all, though they look like it—are the worst of all, but since they live only in South American rivers, I suppose they won't bother you much."

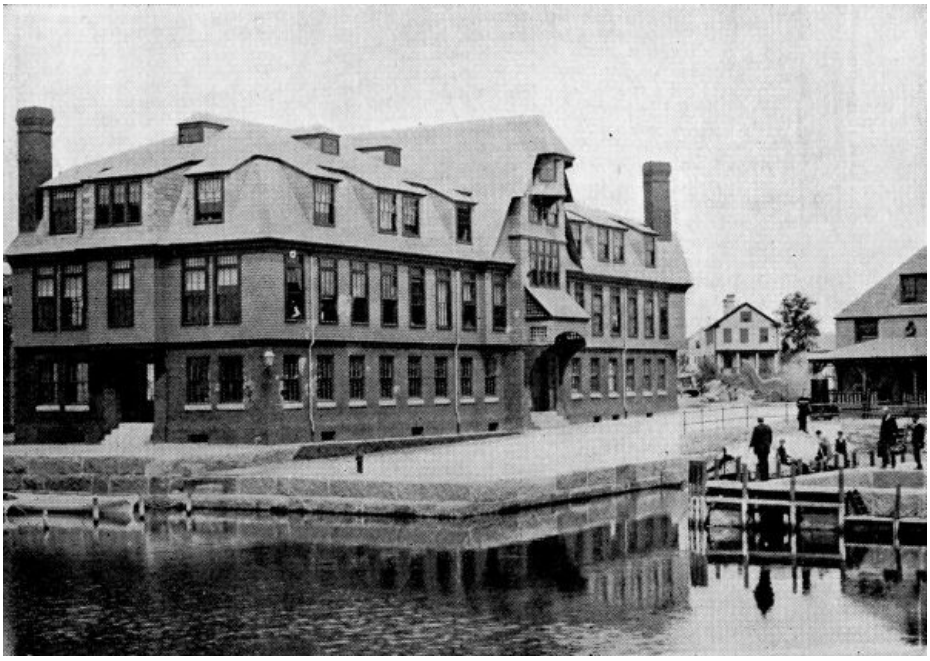
"As long as I don't find any in the fish-trap," said Colin, laughing, as Mr. Wadreds nodded and went on his way, "I won't mind, and I'd just as soon not have to handle any dogfish that swallow lobster-pots as a habit, but if I do I'll come to you for help."

All in all, Colin thought Woods Hole the most interesting place in which he had ever been. Unlike other summer resorts, a spirit of earnest vigor pervaded the little settlement. The houses nestled in the wooded low hills behind the town, and though so near the sea, flowers could be made to grow luxuriantly, as a famous and beautiful rose garden bore witness. To the southeast, over a spit of land that was little wider than a causeway, the road ran to the Marine Biological Laboratory and the Bureau of Fisheries station, holding their commanding positions overlooking the harbor. The great government pier smacked of the stormy sea, for it was used also by the Lighthouse Service and huge red buoys lay in dozens on it awaiting their hour to warn the tempest-driven mariner of the perils that lay below them.

Nearer in, where the pier was severed from the shore, the opening being crossed by a short swing bridge, was a small inclosed inner harbor where lay the launches and boats of the two laboratories. Upon the shore itself was a stone-walled tank, set between the Residence building and the Laboratory proper, and therein large fish which had been caught in traps or elsewhere, and which were too big for the indoor tanks, flitted as dark shadows within the pool. Smaller fish were in the Aquarium in the first floor of the laboratory opposite the wide space where stood the serried rows of hatching troughs.

Here were many most interesting fish—among them that constant delight of the landsman, the puffer, which, when disturbed, rapidly inflates itself, rising to the surface of the water until it becomes apparently so large a mouthful that its would-be devourer is fooled into believing the morsel too big to swallow. Then, the danger removed, the puffer releases the gulped-down water and swims away. Here also were strange fish, like the eighteen-spined sculpin and the sea-robin, walking over the bottom on three free rays of each of the pectoral fins. Upon the top story of the same building were preserved in a rough museum various other strange forms, not all from Woods Hole waters; the remora, or sucking fish, that fastens on sharks and becomes a constant passenger enjoying a free ride, specimens of which were often in the Aquarium; the deal-fish, which alone among its tribe has a long slim fin projecting upwards from the tail almost at right angles to it; the blenny, whose facial expression has caused it to be known as the sarcastic blenny; the graceful sea-horse, who swings on seaweed with a prehensile tail like that of a monkey—and the male of which hatches the eggs instead of the mother, and not the least extraordinary, the three-cornered trunk-fish whose front view is the most unfishlike apparition possible. These and hundreds of others Colin learned to know from the collections.

It was with great delight that Colin heard of the presence of his friend Mr. Collier, who was working on the plans for a model of Bryozoa, and who had with him his staff of glass-workers and modelers. The boy found it hard to tear himself away from this laboratory and struck up quite a friendship with a Japanese colorist on the staff. Also, he was fortunate in meeting and knowing Mr. Cavalier, the artist of animal life, and from him the boy learned a great deal of the picturesque and æsthetic elements of the life which he painted and modeled with such surpassing skill. Scores of other workers, writers, and scientists of all kinds had rooms in the wonderfully interesting workshops of Woods Hole.



Hatchery and Laboratory Building, Woods Hole.
Courtesy of the U. S. Bureau of Fisheries.

Residence and Fisheries Bureau Headquarters, Woods Hole.
Courtesy of the U. S. Bureau of Fisheries.

Beyond the laboratory building was the wharf to which the two steam yachts attached respectively to the station and the M. B. L. were tied up. Beyond that again was a second pier, that of the Revenue Cutter service, where lay, with banked fires, one of the guardians of American seas, a man ever on duty at the wireless receiver. Beyond the pier the land curved to the point opposite the Elizabeth Islands, while in the narrow strait or 'hole' between, the tide for all Buzzards Bay surged out or in as the ebb and flow compelled.

As captain of the fish-trap crew and active in collection, Colin had the run of both laboratories and the day always seemed too short for him. Every investigator's work was a matter of personal interest to him and he talked 'research' all the day long, though too tired to dream of it at night. Nor did he forget his swimming, and at the beach in Buzzards Bay he swam a mile or so each day, the admiration and the envy of all the M. B. L. students. But Colin speedily won their friendship, for he never hesitated to help other swimmers in every way he could, even teaching little tricks of style that were all his own and which had gone far to win him his championship.

As Director Prelatt had promised, Colin was given an opportunity to keep some research work in hand, although he found—as had been foretold—that he had but little time for it. The director was engaged upon a most interesting and important investigation, which, like all those that were in progress at the laboratory, had a strong economic value. This was the study of the life history of the whelk.

"At first sight," the director said to him, when explaining the problem, "it does not seem as though the biology of a sea-snail were a matter of much importance to the country, but as a

matter of fact, to a great extent the oyster industry—which reaches millions of dollars annually and gives employment as well as food to thousands of people—depends upon that very thing."

"Just how, Mr. Prelatt?" inquired Colin.

"All creatures have their own special enemies," the director answered; "and everything is so equally balanced that there are enough oysters born to keep up the supply in spite of the attacks of the whelk, or oyster-drill as it is termed. When man comes on the scene, however, and commences to dredge the oysters, the combination of the market and the drill together is too much for the oyster-beds and they soon become depleted."

"That's the way it is with fish, too!"

"With everything," was the assenting answer. "Now there are two ways to overcome this condition. One is the way in which we handle the same question with fish—by artificially hatching millions more eggs every year than would have been hatched during a state of nature. The other is by attacking the enemy of the oyster and thus enlarging the chances of those that hatch naturally. The latter we can't do with fish."

"Why not, sir?"

"Because the enemies of fish are numerous and free-swimming," was the answer, "and also because fish produce an enormous amount of eggs. Oysters do also, but fertilization is so largely a matter of chance that but a few of the tens of thousands of eggs ever really have a chance to become young oysters. You can help that in two ways, one by preparing the ground so that everything is made easy for the young oysters to have a chance, the other by thinning them out or transplanting the young oysters or 'spat' as they are called, improving and enlarging the beds."

"That ought to help settle it, I should think."

"It is not enough. Enemies also must be kept at bay."

"I should think the oyster, in its tough shell, would be practically free from enemies," remarked Colin.

"On the contrary, it has a large number. A great many kinds of fish, such as skates, for example, will eat oysters, and many owners of oyster-beds have surrounded their holdings with an actual stockade of stakes."

"Like the pioneers had against the Indians?"

"Just the same," assented the director. "Drum-fish are hostile on the Atlantic coast, and on the Pacific a very substantial stockade is required against the invasion of sting-rays. More destructive still are the starfish."

Colin stared at the director in surprise.

"Starfish!" he said, "those little starfish? Why, they're soft and they haven't any teeth or anything to crush an oyster shell with."

"They're small and they're soft and they haven't any teeth at all," said the director, "but starfish cost the oyster industry at least five million dollars a year."

"But how?" queried Colin; "I don't see how they can work it."

"What is a starfish?"

The boy thought for a moment.

"It's an echinoderm," he said, "generally with five arms, that lives only in the sea, has a simple stomach, and feeds on the minute organisms in the water."

"There you're wrong," said the director. "It lives only in the sea, that's right enough, but you haven't proper regard for a starfish's powers of digestion. It feeds on mussels, oysters and other shellfish. Can it swim?"

"I don't think so, sir," said Colin, after a moment's thought, "it crawls."

"How?"

"I don't know, Mr. Prelatt."

"By thousands of sucker-like feet on the under side of it," he was told. "So you see it can crawl to and over an oyster-bed."

"But even so, wouldn't an oyster shut tight at the approach of danger?" suggested Colin.

"That doesn't make any difference to the starfish," was the reply, "he'll open the oyster."

"How, sir?"

"What keeps an oyster closed?"

"The muscle, sir, because when it is dead it flies open."

"Very good. Do muscles grow tired?"

"Mine do," said Colin, smiling, "and I suppose the muscles of oysters are the same way."

"Exactly. Now what happens is this. The starfish crawls along until he finds an oyster which he thinks will suit his taste. As he crawls near or on it, the oyster closes up tight. The starfish—taking plenty of time—fastens himself to the shell, having two of his 'arms' on one shell and the suckers of the other three 'arms' attached to the other shell. Then the starfish starts to pull."

"But isn't the oyster stronger?"

"Much stronger," agreed the director, "but the starfish doesn't know enough to quit. The pull he exerts is not so powerful but it is relentless and unceasing and no oyster muscle can resist it for more than a few hours. Presently the shell gapes open. The starfish lumbers over and commences to feed, other starfish often coming to enjoy the feast."

"And are there starfish enough to injure the beds?"

"Myriads of them. A starfish is not easy to kill, moreover, because if any of the arms are cut off he will grow a new one."

"How do the oystermen fight them?"

"By catching them in tangles. The snarled cotton waste does no harm to the oyster, but, as it is pulled over the bed, picks up hundreds of starfish and sea-urchins. Up-to-date vessels engaged in that work have a vat of boiling water on deck, into which the tangle is plunged when it is pulled up from the bottom. This kills the starfish and is a great gain over the old system of picking them out of the tangle by hand.

"But the worst of all the oyster's enemies," the director continued, "and the one on which I am working, is the oyster-drill. At least eighty per cent of the possible oyster crop is destroyed by this sea-snail. This creature, usually about half an inch long, crawls on an oyster—usually a young one—and with a rasp-like tongue files a hole in the shell, through which it sucks the juices out of the oyster. The only thing that keeps the oyster-drill in check at all is that as soon as it is big enough for a younger drill to climb on its shell, it is apt to suffer the same fate. It is a case of reversed cannibalism, the stronger falling to the weaker."

"What can be done to stop it?"

"Nothing so far," said the director; "that is my chosen problem. Because the drill prefers the thin-shelled mussel to the thicker-shelled oyster it has been suggested that mussels should be planted outside oyster-beds, so that the drills would stay there. But the cure would be worse than the disease, for the mussels would spread over the oyster-bed and the drills with them, since they would have so excellent a breeding ground. No, the problem is still unsolved, and the people of the United States are looking to the Bureau of Fisheries to solve it. The Bureau has given it to me. That's the fascination of this work, that on your own toil and your own skill and ingenuity a factor of world-wide importance may depend."

"Perhaps——"

"What is it, Colin?"

"It just occurred to me, sir," the boy answered, "that perhaps some parasite which would prey on the drill might be found."

"It might—but I have as yet found none."

"Or perhaps," Colin again suggested, "some chemical which would unite with lime might be put into the water so that the oyster shell might be poisonous to the drill, but not for food, because we eat the oyster and not the shell."

The director laughed.

"That suggestion is new, at least," he said, "but I don't think it would work because this is a marine question and the water changes continuously. There must be some solution, there's always a way of doing everything, and some one will find it out. I'm going to stick at it till I do, that is, when I'm not engaged on other Bureau work. But I'm always glad of suggestions, and when you can help me in any way I'll let you know."

"Thank you ever so much, Mr. Prelatt," Colin answered; "I'll be glad to do anything I can."

The boy had a fertile brain, and, before a week had passed by, a line of experiment suggested itself to him in connection with the oyster-drill problem and he explained it to the director.

"To work that out properly would take several years!" the latter said tentatively.

"I thought it would," said Colin, "but perhaps some one else could carry it on, and the work ought to be done, anyway."

"You have the right idea," the director replied; "it's the problem, not the man who solves it. Now," he continued, "I have a surprise for you. Dr. Jimson, who has been working on swordfish for some time, is anxious to try and capture a large specimen and is going out with a swordfish sloop next week. I can probably arrange for the trap to be looked after, if you are off for a day or two. Do

you want to go?"

"Indeed I do," said Colin. "Mr. Wadreds was telling me some stories just the other day about swordfish-catching."

"I suppose he told you the famous story of the swordfish which charged a vessel and drove its sword through 'copper sheathing, an inch board under-sheathing, a three-inch plank of hard wood, the solid white oak timber twelve inches thick, then through another two and a half-inch hard-oak ceiling, and lastly penetrated the head of an oil cask, where it stuck, not a drop of the oil having escaped?'"

What Shall We Get This Time?

Courtesy of the U. S. Bureau of Fisheries.

Here's a New One, Boys!

The veteran collector of the Woods Hole Station is seen in the foreground of both pictures.

Courtesy of the U. S. Bureau of Fisheries.

"Yes, Mr. Prelatt," Colin answered, "and if he hadn't told me that the record was authentic and that the sword and section of timber had been in the National Museum, I might have doubted it."

"They're enormously powerful, one of the best boatmen I ever knew was killed by a swordfish," said the director.

"How was that, sir?"

"He had harpooned the swordfish and had gone out in the small boat to lance it, when the huge fish dived under the craft and shot up from the bottom like a rocket, his sword going through the timbers as though they were paper and striking the boatman with such force that he was killed almost instantly. Boats used often to be sunk by the rushes of a swordfish, but nowadays the greater part of the work is done directly from the deck of a schooner. No amount of changes, however, can take all the excitement out of a swordfish capture."

"Will they attack a boat unprovoked?"

"There are lots of cases in which they are supposed to have done so," the director replied, "but I think any such instances were probably swordfish who had been wounded—but not fatally. You knew that the swordfish was the Monarch of all the Fish?"

"No," Colin answered, "I didn't."

"He was so elected at one of the meetings of the International Congress of Fisheries," said the director, smiling. "We were waiting for the chairman or the speaker or somebody and in casual conversation the query arose as to who was the real master of the seas, in the same way that the lion is regarded as the King of Beasts."

"And the swordfish got the award?"

"After quite a little debate. Plenty of people had their own favorites, the white shark and the killer whale among others, but when it came to a sort of informal vote, the swordfish was chosen almost unanimously."

"I shall be glad to pay my respects to His Majesty," answered Colin with a laugh, as the director wheeled his chair to his desk, "and I'm ever so much obliged for the opportunity."

The next morning, after having hauled the trap, Colin jumped aboard the *Phalarope*, which was going to New Bedford for supplies for the station, and which was to take him there to join Dr. Jimson on a swordfish schooner. A large portion of the surface of Buzzards Bay was dotted with billets of wood, about six inches thick and painted in all manner of colors. Some were red, some white, some black, some yellow and blue, some striped in all manner of gaudy hues.

"I've been wondering," said Colin, as he stood in the pilot house chatting to the captain of the little steamer, "what all those sticks in the water are?"

The captain took his pipe out of his mouth to stare at him in surprise, as he turned the wheel a spoke or two.

"Don't you know that?" he said. "Those are lobster-pot buoys."

"You mean there's a lobster-pot attached to every one of those?"

"Yes, of course."

"But there are thousands of them! Why, right now, I can probably see forty or fifty, and they're not so awfully easy to catch sight of with a little sea running. And why are they painted all different colors?"

"Different owners," was the reply, "every man has his own color. Every day, or every other day at least, he sails out to the grounds—some of 'em now have motor-boats—and makes a round of his pots. A chap whose buoy is yellow has perhaps a hundred or two yellow buoys scattered about the harbor."

"That sounds like work," said Colin.

"It's hard work," was the reply. "A lobster-pot is weighted with bricks and it's a heavy load to pull up in a boat. It's an awkward thing to handle, too. Then a lobsterman has to rebait his traps, and as he does that with rotten fish, it's not a sweet job. And he can only bring in lobsters over a certain size; anything less than nine and a half inches in length he has to throw back. Sometimes it'll happen that the traps are full of lobsters that are too short or too small, 'shorts' they call 'em, and his day's work won't bring him in much. There's a living in it, but that's about all."

Finding that the captain of the *Phalarope* knew the lobster business well, as do most men who are natives of the region, Colin kept him busy answering questions until they ran into New Bedford. As the old center of the whaling industry, the harbor had a great interest for Colin, but there was but one of the whaling ships in at the time, and the ancient fisher-town atmosphere was greatly marred by extensive cotton mills that had been built along the river, just below where the whaling piers used to be. The swordfish schooners were at the pier, however, large as life, and Colin felt quite a thrill of excitement as he stepped aboard the little vessel on which he was to live for the next couple of days, and saw the narrow dark bunks in the entirely airless cabin in which four men were to sleep. Dr. Jimson and Colin practically were going as members of the crew, the two men, whose places they were taking, staying home from the trip.

Long before sunrise the following morning they were up, and by daybreak the schooner was standing out of the harbor for Block Island, one of the famous haunts of the swordfish. Colin, who had good eyesight, and who was always eager to be up and doing, volunteered to go to the crow's-nest and keep a lookout for the dorsal fin of a swordfish, which, he was told, could be seen a couple of miles away. There was no advantage in going aloft, however, until toward noon, when, the water being still, the swordfish come up to sun themselves.

Once Colin was quite sure that he saw a swordfish, but just as he was about to shout, there flashed across his mind a sentence that he had read somewhere of the likelihood of confusing a shark's fin with that of a swordfish, and soon he was able to make out that it was a shark. As it grew toward noon and the sun's rays beat directly on him, Colin began to realize that sitting on a scantling two inches by four at the top of a schooner's mast in a bobbing sea, under a broiling sun, was a long way from being a soft snap, but he would have scorned to make a complaint. He was more than glad, though, when the cook hailed all hands to dinner, and one of the sailors went to the crow's-nest.

At dinner Colin turned the conversation to swordfish and their ways.

"There's one thing I don't quite understand, Dr. Jimson," he asked, "is a spear-fish the same as a

swordfish, only that the weapon is shorter?"

"Not at all," was the reply, "the spear-fish is a variety of the great sailfish, which you see in West Indian waters six or seven feet long, with a huge dorsal fin, blue with black spots, looming above the water like the sail of a strange craft. But the real difference is in the spear or sword. In the case of the spear-fish it is bony, being a prolongation of the skull; in the case of the swordfish it is horny, and horns, as you probably know, are formations of skin rather than bone. Now the narwhal's tusk," he continued, "is again an entirely different thing."

"That's a tooth, isn't it?"

"Yes," was the reply, "it seems to be the mark of the male narwhal. Sometimes a narwhal has two tusks, but generally only one—on the left side. The females have none at all. You know the unicorn is always represented with a narwhal's tusk? One of the early travelers, Sir John de Mandeville or Marco Polo, I forget which, brought back a narwhal's tusk which, he had been told, had been taken from a kind of horse. I really suppose that the native who sold it believed it was from some species of antelope. But to this day the arms of Great Britain show a horse having a fish's tooth sticking out from his forehead like an impossible horn."

"Way-o!" suddenly came the cry from the masthead.

"Where away?" called the captain, jumping up and looking around.

"Three points on the starboard bow, sir," answered the sailor, pointing his finger.

"That's right enough. You're in luck, Dr. Jimson," he added, turning to his passengers, "you won't have had long to wait if we catch this one for you."

The captain walked aft, saw that everything was clear on deck, then stepped forward and walked out on the bowsprit to the 'pulpit,' the characteristic feature of a swordfish schooner. This was a small circular platform about three feet across, built at the end of the bowsprit, with a rail waist high around it and a small swinging seat. Triced up to the jib stay was the long harpoon with its head, known as the 'lily-iron.'

The schooner, having the wind abeam, danced smartly over the waves toward the long lithe fin, gliding swiftly through the water. The captain, standing like a statue, waited until the craft was within ten feet of the unconscious swordfish, then thrust downward with all his might. It was a thrust—not a throw—and the muscular strength behind the blow caused the steel to pierce the thick skin of the swordfish. At the same instant the keg around which the line had been wound was thrown overboard, and the water flew up like a fine jet from the rapid revolutions of the barrel as the swordfish sped away with the line.

"How in the world are you going to haul him in now?" asked Colin, when he saw the keg thrown overboard.

"Did you think we pulled him in, same as you would a cod?" asked the captain.

"Why not?"

"Too much chance of sinking the schooner!" was the reply. "That isn't the way to get a swordfish."

As soon as the line on the barrel became unwound, it tightened with a jerk and the barrel disappeared under the surface. But the resistance that the barrel full of air at the end of the long line gave was great and even the powerful swordfish could not tow it for long. In a few minutes he slackened his speed and the barrel bobbed to the surface. But the swordfish was still traveling like a railroad train, in short rushes, however, here and there.

"See him charge it!" cried Colin.

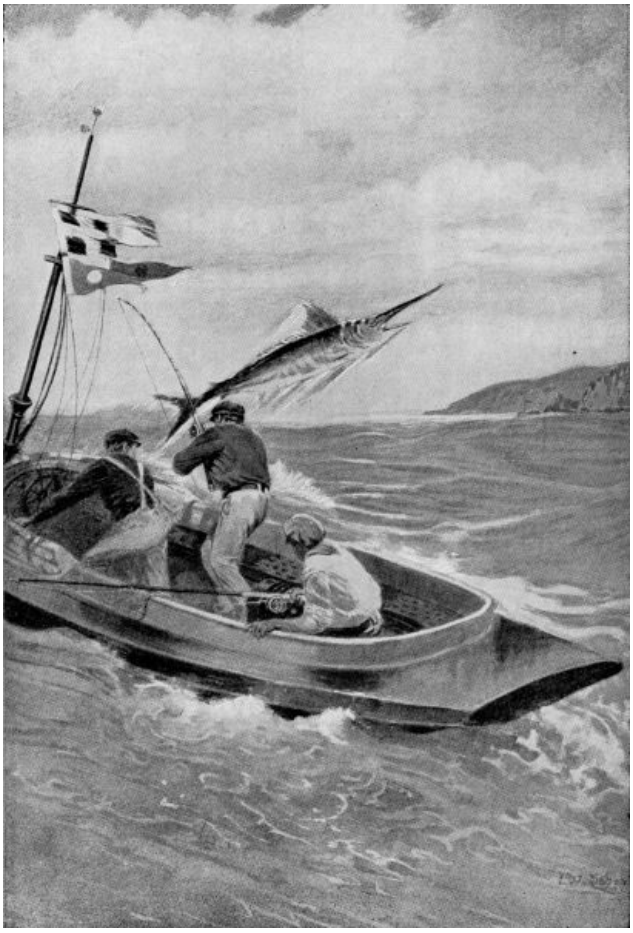
There was a swirl of water and with a speed which seemed incredible the huge body launched itself at the barrel. But there was no resistance, the keg revolved as the sword struck it, and the swordfish shot into the air. Again and again he charged, and Colin realized what danger lay behind that ton and a half of muscle backed by a power that could drive such a weight at sixty miles an hour through the water.

Again the Monarch of the Sea shot away, towing the barrel, but it was a disheartening drag, even upon the magnificent strength of the great swordfish. Little by little the rushes became shorter, the spurts less frequent, as exhaustion and loss of blood began to tell. The captain ordered out the boat and, at his earnest appeal, Colin was allowed to go.

"You're light," the captain of the schooner said, as he picked up a lance not unlike a whale lance, "and we don't want much weight in the boat because it might pull the barb out of the fish if he starts to run."

"This reminds me," said the boy, "of the time I was spearing whales in the Behring Sea," and he recounted the adventure briefly as they pulled toward the swordfish. The Monarch of the Sea, who had never had a chance to show his powers, being handicapped by the barrel dragging back his every movement, caught sight of the boat. He did not wait to be attacked, but rushed with renewed fury at this new foe. The captain, apparently unmoved, waited until the fish rose at the boat and then he thrust in the lance with all his strength. The force acting against both fish and boat drove the latter sideways a foot or more, so that the giant rose in the air not two feet from

the gunwale of the boat, the spray stinging like fine rain as the wind of his leap whistled by.



Catching Swordfish with Rod and Reel.
Dangerous method of capturing the monarch of the sea, used only by expert anglers.
By permission of Mr. Chas. Fredk. Holder.

"He'll charge again in a minute," the captain said quietly, "look out always for the second rush."

The words were scarcely out of his lips when the fin appeared. Once again, as before, that great mass of dynamic energy hurled itself at the boat, but twenty yards away there came a sudden check and the swordfish dived. A second passed—so long that it seemed like a minute, while Colin waited shiveringly to hear the crashing of the timbers and to see that fearful weapon flash up between them, but as silently as a shadow the lithe gray fighting machine shot up from the deep a yard or two astern of the boat and, falling limply, turned on his side, dead.

The captain smiled.

"If he had lived about a half a second longer," he said, "I reckon this boat would be on its way to the bottom now."

CHAPTER X

RUN DOWN DURING A SQUALL

On the way back to New Bedford, Colin begged for the 'sword' of the swordfish as a trophy, and, permission being given, one of the boatmen volunteered to prepare it for him, offering to clean and polish it so that the weapon would show to best advantage. Dr. Jimson had been excessively courteous to Colin throughout the trip, and his fellow-feeling was greatly increased when he learned that the boy also was a holder of the blue tuna button, for he himself was an enthusiastic angler.

"I'm a trout-fisher by preference," said Dr. Jimson, settling himself down for a chat as the schooner sailed quietly on its way to New Bedford, with a dropping wind, "and I believe that the steelhead trout, in the streams that flow through the redwood forests, are the finest fish alive."

"I thought the rainbow trout was supposed to have the call," said Colin; "at least, Father always declares so, and he goes up to the Klamath region nearly every year."

"The rainbow is a very gamy trout," agreed the angler, "and it runs large, up to twenty pounds sometimes, but pound for pound, there's more fight in a steelhead."

"What's the Dolly Varden?" Colin queried. "I never can get the various kinds of trout clear in my

mind."

"If you can keep them clear when you have them hooked," said the other, with a jolly laugh, "that's much more important. But a Dolly Varden isn't a trout at all, it's really a char. It's a beautiful fish, too, and you find it in cold, clear streams, such as the upper waters of the Sacramento and Alaskan rivers. In Alaska it swarms in millions. But the most beautiful trout in the country, indeed the most beautiful fish in the world, perhaps, are found in three little streams on the very top of the Sierra Nevada. Did they tell you the story, in Washington, about the three forms of golden trout?"

"No, Dr. Jimson," the boy replied; "Dr. Crafts mentioned it, but something came up to turn the conversation."

"I went up on that expedition a few years ago," the trout-lover said, "because I've done a good deal of work for the Bureau on the whole salmon family. Trout and salmon are very near relatives, and the trout will go up streams and leap small falls just as the salmon do. But, as you can easily see, in the headwaters of streams rising high in the Sierras, there are sure to be falls that trout cannot leap."

"Yes, sir, of course."

"Now, my boy," the other said impressively, "a few years ago, it was found out that there were trout in these streams above falls which would be absolutely impassable to any fish. How could they get there? It was a riddle. The only possible answer was that the fish must be older than the falls, that the stream had worn away its bed, bit by bit, until an impassable barrier from below had been created, but that the trout had gone on in the upper creeks, developing in their own way, for hundreds of centuries.

"The rocks over which these streams flow are a granite formation, very brightly colored, principally gray and red. The swiftly-flowing stream removes the débris, so that the clear water flows limpidly over this gorgeous coloring. In such a stream, where the natural enemies of the trout are the fish-hawk and the eagle, it is essential as a matter of protection that the fish should resemble the hue of the bottom, and accordingly, the most superb coloring in the world is theirs. But each of the three small streams that are cut off from the rivers below are also separate from each other, and in the ages during which this has been so, each of these streams has seen a different coloration develop in the trout. All are bright golden, all have orange fins and an orange stripe along the side, all are spotted with black, but they vary in many small particulars. Nowhere else in the world but in these three creeks—Volcano Creek, Soda Creek, and Aqua Bonita or Gracious Water Creek—can these fish be found; nowhere else would they retain their gorgeous coloring.

"Accordingly, the United States Government sent a party up to the very summit of the Sierra Nevada to study these fish, and of this party I was one. It was there that I saw the most marvelous storm that has perhaps ever been recorded. An electrical disturbance of great magnitude was passing over the country at the time, and it reached its vivid climax on the Sierras. Our camp was struck, several animals killed, and a couple of the teamsters severely injured, but for nearly two hours the whole world seemed set in a coronal of lightning flashes.

"We stayed up there with the trout for several weeks, and when we reached Washington, there was not a man in the party but was determined to fight, heart and soul, to save these rare fish from extinction. One or two summers during which 'fish-hogs' were permitted on the upper reaches of the Kern River, would have destroyed the trout forever, and, indeed, in one month a party of those reckless near-sportsmen destroyed almost one thousand of them. But the President's interest was enlisted, the Bureau of Fisheries made a firm stand, and to-day the region containing these most exquisite and most wonderful of all fresh-water fish is a part of the Mount Whitney National Park, and the golden trout are saved from extinction."

"Bully for the Bureau!" cried Colin. "Every time I learn more of its work, it seems to be doing something finer."

Following out the lad's interest in the whole trout question, Dr. Jimson taught him nearly all there was to know about the various members of the salmon and trout family, one of the most important food-fish groups of the world. Both being ardent fishermen, they were startled, however, by the sudden announcement:

"Big halibut off starboard quarter!"

"Yes," said Dr. Jimson, "there it is! Don't you see it," he continued, pointing with his finger, "flapping its tail on the water?"

"I see," said Colin; "but what is it doing that for?"

"Probably attacking a fish," was the reply. "Are you going after it, Captain?"

"No," the fisherman answered; "I've heard that people sometimes catch them without a net, but I never did."

"One of the biggest halibut that was ever brought ashore was caught in just such a way," the trout expert said, turning to Colin. "It was out near Sable Island, and the halibut was attacking a big cod by repeated blows with its tail. A boat was sent out with a couple of men carrying gaff-

hooks, and the fight between the two fish was so fierce that neither of them paid any attention to the boat. The fishermen gaffed the halibut and pulled him into the dory, though it nearly swamped them, for the fish weighed over three hundred and fifty pounds. It's rather a queer story, I think, but it is reported as official."

Colin whistled.

"My word!" he said. "It must have been a big one, because a halibut is flat, like a flounder, isn't it?"

"Yes, it's the largest of the flatfish. There's a record of one halibut having been caught weighing a trifle over five hundred pounds. Usually a fish one-fifth of that size is considered large."

"Flatfish are funny creatures," said Colin. "I've often wondered how the eyes in various species wander around in their heads."

"Other people have wondered, too," said his companion.

"Well, but we know something about it, don't we?" protested the lad. "Aren't the eyes all right in the young fish?"

"Certainly," was the reply, "and, what's more, the young fish swims upright."

"How does the eye move round, then? Does the eye on one side go blind and another one grow on?"

"No," answered his friend; "your first idea was the right one, the eye moves round. But, as a matter of fact, it goes through the body. The young flatfish is thin and almost transparent, and when it begins to be time for the eye to change from one side of the body to the other it sinks in. A thin, transparent skin grows over the socket and the eye sinks in and in, the bones moving away from before it, until it has come near the proper place on the other side. Then a new socket opens for the eye, and it finally arrives at the end of its journey through the head, thus coming on the same side as the other eye. At the same time, too, the flatfish gets the habit of swimming on its side, and its color scheme changes, one side—which has become the bottom—being white, while the upper side is dark and spotted to look like the stones on the bottom of the sea."

"What do flatfish eat?"

"Everything," was the reply, "from a clam to a codfish. But the favorite food of the halibut, for instance, is sting-ray, and consequently it is a good friend of the oysterman; where there is plenty of halibut, there will be few sting-rays, and these last are destructive to a good oyster-bed."

"It seems to me," said Colin, "that the whole story of the seas is that fish eat fish, while the few that escape from their own kind are gobbled up by seagulls and terns and other birds."

"Yet," said the other, smiling, "the birds don't have it all their own way. Sometimes the fish gobble them!"

"Can they eat birds?"

"It's a little rare," was the reply, "but there's one authentic case on record in which a fish's stomach was found to contain no less than seven wild ducks."

"Why, I always thought that fish had a small mouth in proportion to their size. It must have been a monstrous big one!"

"It was not much more than four feet long," was the reply; "but it is one of the few fishes having a huge mouth. They sometimes call it a goosefish, because it attacks wild geese, but the right name is fishing-frog or angler. It glides along the bottom until directly beneath where ducks are feeding, and when one dives for worms in the mud—you know the way ducks go down—the angler catches it by the neck and drags it down and then swallows it at leisure. You see the bird hasn't a chance, because all the angler-fish has to do is to hold it until it strangles."

This led to a discussion of the food of fishes, and under the spur of the boy's questions, the scientist outlined for him the dietary of almost every fish that swims, together with all the various ways in which water is aerated, such as the growth of water-plants and the currents of streams.

"It still seems to me," said Colin, "that nearly every fish lives by fighting some other fish. It's a wonder," he added, with a laugh, "that there aren't some professional fighters among them."

"There are," his friend replied; "that is to say, in the sense you mean. There's a fish which is called the fighting-fish, that is regularly trained by the fishermen, and the combats are so famous that when one is scheduled to come off a big crowd gathers."

"Where?" asked Colin incredulously. "That sounds a little as if you thought I was one of the marines, Dr. Jimson."

"It is absolutely the case," was the reply. "And, what is more, they advertise these fights widely and get big gate receipts, just like a baseball game here. The sum of money taken in for admissions, too, has become so large that the Crown refuses to allow the fights to be held unless a certain percentage is paid over to the king."

"Where can that be?"

"In Siam," was the reply. "The fighting-fish is distantly related to the perch, but it has been used for public combats for so long that it has become highly specialized. It is really a sort of gamecock among fish, and the money expended in licenses in Siam brings in a comfortable revenue to the Crown. The owner of a champion fighting-fish never needs to work for a living, he can easily be supported by the winnings of his possession. Often a fish or a team of fishes is owned by a village and the rivalry between communities is intense. The Siamese are inveterate gamblers, also, and in more than one instance the Siamese Government has had to send supplies to a village which was threatened with famine because all the villagers had lost their crops through betting upon the success of their team of fighting-fish."

"You say it's a kind of perch?"

"Only distantly," was the reply; "it belongs to a very curious group of fishes which cannot live long in the water unless they can breathe air once in a while, nor can they live very long in air, unless they breathe water occasionally. The fish that climbs tall trees is a member of the same sub-order."

"You mean the skippy?"

"No," the scientist answered; "it's a much better climber than the skippy. It will run up the trunk of a palm tree."

"Now come, Dr. Jimson," expostulated Colin. "Do you expect me to believe that?"

"Certainly, when it is true," came the reply. "The statement often has been made and then disbelieved, but there is plenty of scientific evidence now to arm its truth."

"Does it climb up to the top and crack cocoa-nuts?" queried the boy, still incredulously.

"Not quite that," his friend said, smiling. "I believe seven feet is as high a climb as is known, that being recorded officially by one of the staff of the Madras Government Central Museum. The creature usually only climbs during a heavy tropical rainstorm, and it is believed that the fish, accustomed to ascending tiny streams, is stimulated to climb the tree by the rush of water flowing down the bark. The gill cover is movable, and the spines of the ventral fins very sharp. It doesn't go up head first, you know, but sideways."

"How does the fish climb down, then?" queried Colin.

"Tumbles," was the laconic reply.

"And starts up again?"

"No, it usually hops sideways over land to a mud-bank again, not to have another climbing fit until the next big tropical shower comes after a period of drought. But if you wanted to find out all the strange habits of fishes," continued his friend, as the schooner ran into New Bedford harbor, "it would take more time than one swordfish trip would give you."

Clammer Raking for Quahaugs in New Bedford Harbor.

Courtesy of the U. S. Bureau of Fisheries.

Oysterman Tonging for Oysters in Buzzard's Bay.
Courtesy of the U. S. Bureau of Fisheries.

On the way back to Woods Hole, going down the harbor, Colin questioned the captain of the M. B. L. boat, the *Cayadetta,*—which happened to have been at New Bedford that afternoon, and on which he had been given the courtesy of a passage—why there seemed to be two different kinds of boats scattered over the harbor oystering.

"That feller's not oysterin'," the captain answered; "he's rakin' quahogs."

"Quahogs?"

"That's clams," was the explanation; "the right name for what the people down in New York call a 'little-neck clam.' The 'neck' is a foot, and it's little because the quahog doesn't burrow deep. The long or soft clam does."

"And he just pulls them up with a rake?"

"Yep," was the reply; "big rake with curved tines to it. You see he jerks his rake along until he feels it full, then pulls it up. Now, this feller, over on the other side here, he's not goin' after clams at all. He's oysterin'. Ef you'll notice, he has two poles an' he works 'em apart an' together again like a pair o' shears, an' then when he feels he has a load, he hauls it up the same way, picks out the oysters that are big enough, an' throws the small ones back together with the stones an' other rubbish that he has brought up. They call that 'tonging' oysters, an' the thing he uses is called the 'tongs.'"

"I've been wondering," said Colin, as they passed over the bay and he noted again all the lobster-pot buoys which had interested him so greatly on the way to New Bedford, "I've been wondering whether there was any crabbing done up this way?"

"Not much," the captain answered; "there's one caught now an' again, but all the good eatin' crabs belong further south. New Jersey's the place f'r crabs, an' I reckon most o' the soft-shell crabs o' the country come from there, but the business o' cannin' crabs is done way down in Chesapeake Bay, where there's crabs no end."

"A soft-shell crab is just the same species as the regular blue crab, isn't it," asked the boy; "only it has cast its shell?"

"Jus' the same," was the reply, "but for the market, an' there it's worth four or five times as much."

"When you come to think of it," said Colin, "there isn't much in the sea that isn't fit for food. Even the swordfish is good eating."

"There's some poisonous fish down in the tropics," was the reply, "but I reckon that but for a few of those, a hungry man could eat nigh anythin' that came out o' the water, fish or shellfish or anythin'. An' you know," he added, "some folks, like the Japanese an' South Sea Islanders, prefer 'em raw."

"Doesn't sound good to me at all," the boy said with a laugh, as the little steamer turned into the 'hole.' "I'm satisfied to eat oysters and clams raw, but not much else."

The rest of the month passed all too rapidly for Colin, who was becoming greatly attached to Woods Hole. The sense of accomplishment was strong throughout the place, every one was conscious that time was well spent, and the atmosphere of the little village was one of entire content. The boy made any number of friends, but above all, he took his greatest delight in knowing that he had really found the work that he wanted to do, and in trying as hard as he could to fit himself for it. Every day he spent in the Bureau he saw more clearly the value of the work it had done and the opportunities for other great advances. The exportation of live fish to foreign streams had a great attraction for him.

"You know, Colin," the director said to him one day, when he was speaking of the Bureau work, "all over the world there are fish which we ought to be able to acclimatize in American waters, and there are American fish which would thrive abroad. It has always been an idea of mine that we could probably prevent famines in large parts of Asia by looking after the fish supply. You hardly ever find a bad crop and a bad fish year come together, the one always makes up for the other. Just think what a gain it would have been in some of these Chinese and Indian famines if they could have had all the fish they wanted. Millions of lives could have been saved. The Bureau of Fisheries of this and other countries won't have finished its work until every river and stream of fresh water, every lake, and every square mile of the ocean is stocked with the very finest of the food fishes, and the undesirables are weeded out."

"Weeded out, like a garden?"

"Just exactly! Every hogfish and lamprey in American waters—that's a near-fish that sucks the blood of other fish, you know—should be exterminated just in the same way that the farmers of the country are making away with the Canada thistle. Against the sharks—the tigers of the sea, the killers—the wolves of the sea, and all the other predatory forms, relentless war should be waged until the wild fishes of the sea are destroyed, as the wild beasts of the forest have fled before the face of man."

"Could that ever be done?"

"It will be done," the director answered, "but not in my time nor in yours. It is a piece of work in which every step counts, and just one summer's work may bring results that will help millions of people in the years yet to come."

"And I shall have a share!" cried Colin, his enthusiasm kindling.

"Every one has a share; in the Fisheries, no work is wasted, no energy is lost. Whether it be such research as that which you have seen me doing upon the oyster drill, or the spectacular administration of the seal herds on the Pribilof Islands, or the dry statistical work of estimating the value of a fishery—on which work Dr. Crafts writes me he is going to send you—each part has its place and a big place. The aims of the Bureau are on so vast a scale that nothing is petty. We think in terms of millions and tens of millions, and Nature responds. There are more showy ways of helping the world, but for the accomplishment of great results I know of none superior."

"You said, sir," said Colin, who had been startled by the reference to himself, "that Dr. Crafts had some other work for me?"

"Yes," was the reply. "You know that the Laboratory here only keeps open until the first of September, don't you?"

"Yes, Mr. Prelatt."

"What had you thought of doing between then and college?"

"I hadn't made any plans."

"I have a letter from the Deputy Commissioner, here," the director continued, "in which he asks me if there is any one of the young fellows whom I have had for the summer who would like to go with one of the statistical field agents, and he suggests your name, should you wish to go. It will be a short stay, not more than ten days or so, and won't interfere with your getting back to college."

"I should like to go, ever so much," said Colin, "and I think it's awfully good of Dr. Crafts to think of me."

"Very well, then," answered the director; "I'll write to him about it. I thought you would accept, unless you had made other plans."

"I don't think I know much about the statistical side of the Bureau," said Colin; "just what does that take up?"

"Statistics mainly, but I can explain its value best by what I know it has done," the director said thoughtfully. "One of the very best things it accomplished, I think, was an investigation into the cause of the heavy loss of life among the crews of New England fishing-vessels."

"What was the cause, sir?"

"The statistical division of the Bureau ascribed a great many of the fatalities to badly-built vessels, so that a number of them foundered at sea in bad weather."

"How could the Bureau help that?"

"It did help it wonderfully," the director answered. "A thorough investigation was set on foot and all kinds of vessels examined. The experts of the country were consulted and hundreds of models made to find out just which was the most seaworthy. The fishing-fleets of all the world were visited, and as a result a schooner was built and called the *Grampus*, which became a model for all that was most to be desired in fishing-vessels. The boat-builders of the country since then have followed that type, and the loss of life from vessels of the *Grampus* type in the last ten years has been less than one-fourth of that from the older vessels in the ten years preceding. From the port of Gloucester alone, this has meant in the ten years a saving of over six hundred lives."

"That's getting results!" said Colin admiringly.

"And the commercial results, while they don't compare in importance with the saving of life, of course, are even bigger. The winter cod-fishery of New England was absolutely revolutionized by the introduction of gill-nets with glass-ball floats, the catch becoming three times as large, while at least one hundred thousand dollars was saved annually in the single item of bait. Scores of new fishing-grounds have been located, and apparatus has been devised which enables the fishermen to exploit grounds which they previously had been unable to reach.

Testing the Ocean's Crop.

Experimental haul on the Bureau's vessel, the *Fish Hawk*, to determine the character of the population of shore waters.

Courtesy of the U. S. Bureau of Fisheries.

"There are so many different things being accomplished that it's hard to name them all, but you can see for yourself that some one has got to collect the figures on fisheries in order to determine how the industry is progressing. If a town reports a bad season, when all the other ports have been fortunate, the Bureau finds out why. If the catch of a certain fish is decreasing all over the country, then this species must be turned over to the fish culturists for artificial hatching and increase of supply, and so on in a thousand directions. The statistical end has to get the figures. We base all our work on those."

"I wonder what I shall have to do?" said Colin, with a note of query.

"That I don't know anything about," the director answered. "As director of the Biological Laboratory, I'm on the scientific division, and really can't tell you much about the cultural and statistical ends. I understand, however, that the Deputy Commissioner plans to send you to the mackerel fishery."

"From Gloucester, Mr. Prelatt?"

"No, from Boston. At least that is where you are to meet Mr. Roote. Rather a full review of the mackerel fishery has been made, so I suppose this is some special inquiry. The regular statistics of Boston and Gloucester fish-markets are so important that local agents are appointed to make monthly reports. You have not been called on much for extra collecting recently, have you?"

"No, sir," answered Colin; "almost all the research workers have enough specimens for the work they're doing, because it's too near the end of the time to start any new details. So I haven't much to do except to look after the trap."

"We'll get a few days together on the oyster drill, then," said the director, "before you go away."

When the time came for Colin to leave Woods Hole he found himself most reluctant to go, and he rather regretted that he had accepted the mackerel fishery investigation, because he saw that he could have got permission to work on with Mr. Prelatt for a week or two. But the matter had been arranged, and when the boy arrived in Boston, he was alert with the interest of a new experience.

The statistician was a silent man. He greeted Colin with few words and eyed him critically.

"Hm! You can handle a boat?"

"Yes, sir," said Colin in surprise.

"Get aboard the *Shiner* at seven-thirty to-morrow, at the dock next to Gray's," and he nodded his head and walked off, leaving Colin to stare after him.

"Well," the boy said aloud, "that's short enough and clear enough, only I don't happen to know where Gray's is!"

A little questioning around the waterfront, however, enabled him to find the vessel, and as the lad had been in Boston a couple of times before, the search was not long. The *Shiner* hailed from Gloucester and was "the real thing," as Colin said under his breath. One hundred and twelve feet long she was, with an air, as she sat on the water, of knowing every little wickedness of the ocean and understanding the way to conquer it too; her mainmast cleared eighty-five feet, and was stepped well forward, with a boom that Colin did not overestimate greatly when he put it at eighty feet. Although the boy was not a keen judge, he thought the bowsprit immensely long, and noticed what a narrow nose the seiner possessed.

Early the next morning she put out. The weather was ugly, but the captain of the *Shiner* was a Gloucester fisherman, and he went slap down Boston Harbor with every inch of canvas set alow and aloft. The seiner lay well over on her side, and Colin, while he had often sailed in small boats with the lee rail under, found it a new sensation to go tearing along at such speed. He knew nothing of his new chief, and stole a glance at him, finding the statistician smoking a pipe with entire unconcern.

Colin smiled to himself. For a moment he had forgotten, the statistician was a Bureau man, too. The *Shiner* sped out to sea, cleaving the water at thirteen knots an hour easily, although her thirty-six-foot seine-boat was towing after her.

"She certainly can sail, Mr. Roote!" exclaimed the boy, but he only got a grunt in reply.

The evening of the third day had come before Colin gained any idea as to the purpose of this trip. He saw that it would be no use asking questions, and waited until he should be told what he was to do. In the meantime, he was enjoying the sail immensely, for the craft seemed instinct with life, and Colin learned from the other fishermen aboard that she was one of the fastest vessels out of Gloucester. Colin had settled himself under the blankets for the night and just dropped off to sleep when there came a hail from the masthead.

"Fish! Lyin' nor'-nor'-east."

Every man stirred in his bunk, but none made a move. Colin, who had wakened instantly with muscles tense and ready to spring out, followed the example of the others round him, and waited. Indeed he dropped off to sleep again, when the voice of the captain came from the wheel:

"Pass the word to oil up."

There was no need to say "Pass the word," for every man below heard the order, and tumbled up at once, sliding into sea-boots, oilskins, and sou'westers. Most of the men lighted a pipe, and one or two took a 'mug-up' from the coffee-kettle. Evidently the mackerel were not far away, for in less than five minutes the captain called again:

"All on deck!"

Up the ladder went the fishermen with a rush. There was not a star visible, and the night was as black as though the ship were plunging into a cave. Even the phosphorescence or 'fire' at the ship's bow was not especially brilliant, and Colin tumbled over half a dozen different things in as many yards on deck, while only the fact that he had sea-boots on saved him from barking his shins on the fore-hatch.

"Drop over the dory, haul up the boat!"

The commands came ringing out sharply. Colin had been aboard a man-of-war, but there was no such discipline as this. The words were scarcely spoken, when four of the men had the dory over the starboard rail, while eight of the men tailed on to the painter of the seine-boat and brought it to the port fore-rigging.

"Tops'l halyards. Lively now!"

With a rattle and whir the two great sails went soaring up in the darkness, and the *Shiner* leaped forward, her lee rail almost flush to the sea.

"She's a great boat," said Colin to one of the men near him; "I shouldn't have thought she could have stood the tops'ls."

The fisherman looked at him.

"Jerry Fitzgerald is the skipper o' this craft," he said, "an' he's got the reputation o' carryin' all canvas in a full gale. See the lights around us?"

"I saw one or two," Colin answered. "Other seiners?"

"O' course, an' do you think Jerry's goin' to lose a chance o' the school because o' canvas? Wait a bit an' you'll see!"

Not a minute had passed by before another order came.

"Give her the stays'l. Run up the balloon, too!"

Colin gasped, but he lent a hand. As the *Shiner* felt the added sail she poked her nose in and took the water green. But the narrow build forward threw off the load, and she rose like a duck. The seiner was carrying a fearful press of sail, but she stood up stiffly under it, all the red and green lights of the other seiners falling astern; it was evident that the skipper meant to keep them there. Before long, occasional flashes of light, being the phosphorescence churned up by the tails of a pod of mackerel, could be seen from the deck.

"Into the boat!" cried the skipper.

For just a second Colin hesitated, but he saw Mr. Roote go into the seine-boat and he followed immediately. The seine-master, who had been aloft, came down with a rush. Colin could hear the rustle of the oilskins as he partly touched the stays, but he landed on the deck with a 'thump' as great as though he had leaped down the last ten feet. The seine-boat was dropping astern as fast as one of the crew, who remained on deck, could pay out the painter, but the seine-master gave no heed to the rapid departure of the boat. He took half a dozen quick steps to the stern and leaped over the quarter, judging the distance so accurately that he landed fair on the foremost thwart of the seine-boat as she dropped astern, a couple of the men catching him as he jumped.

"Easy on the painter!" he cried. Then, next moment:

"Stand by the dory," as the smaller of the boats, with two men aboard, came sliding by and was almost thrown on top of the seine-boat by a cross-sea.

There came a fire of orders from the captain, which Colin could hardly follow, and he wondered how the helmsman and one man on deck could keep up with them.

"Ease off the main-sheet! Dave,"—that was the man at the wheel,—"swing her away a bit. Steady there! Slack the foretops'l and stays'l halyards. Lively now! Jibe her over, Dave! Down with the balloon, there! Quick as the Lord'll let you! Over she comes! Stand by in the boat and dory! Keep her down, Dave! Down, man, down! It's a good school."

There was a moment's pause.

"You in the boat and dory?"

"All ready, sir," answered the seine-master.

"Ready, dory?"

"All ready."

"Hard up, Dave! Steady a little. A little! Don't you know what a little is? Ready in the boat, there! Steady with that wheel! Now you've got her. You in the boat, there. Got that new-fangled net ready?"

"Ready," cried the statistician shortly. Then Colin understood. The trip was for the purpose of testing out a new net devised by the Bureau and the Fisheries man was a net expert. No wonder he knew a boat!

"Stand by the boat. Ready, the dory! When I give the word! Hold on a bit with the painter! Now let her go! You in the dory there, show your lantern! All your own way now!"

Colin tugged at his oar. Never, in all his experience in rowing, had he tackled anything like an oar of that size, but he pulled for all he was worth, and a glow ran through him to feel that he was holding up his end. The light dory with two men aboard, came racing after them. It was nearly a half-mile pull before the seine-master cried:

"Over with the buoy!"

And the buoy was tossed overboard for the dory to pick up and hold to windward.

Then the silent Fisheries officer got busy. Without a word, he reached for the net. It was made of a lighter twine than customary, and not thickly tarred, having also different corks to the usual type, and sinkers all over the net. It looked like a fearfully complicated thing to handle and Roote was a small man, but that net went flying out as though tossed by a giant.

"You're a jim-dandy with the twine, all right," said the seine-master admiringly. He turned to the rowers, "Put your backs into it, boys," he said; "drive her for all you know how. We've got to give this new contraption a fair chance."

"How much net out now, sir?" he asked the statistician in a few minutes.

"Quarter of a mile," was the reply.

"Shall we close in then, eh?"

"You'd better."

The seine-master, feeling that the school of mackerel had been inclosed, turned the seine-boat towards the dory and, under the powerful arms of the fishermen, the circle was soon completed. It was a perfect set.

The wind had been rising rapidly, and just as the seine-boat reached the dory a sharp rain squall struck. But the cry was, "Purse up!" for until a seine is partly pursed up, there is no telling whether the fish are really in or not. For a moment, however, it was almost impossible to purse up, the wind and rain were beating so savagely.

"Pull!" said Roote, suiting the action to the word, and all hands joined him. The net was light, far lighter than the old fishermen's nets, and there was more than one audible comment to the effect that the net would break, and that it was too bad they hadn't one of the old-style nets around the school, but the pursing in continued, and the net showed no signs of breakage. Presently first one, then another, fish flashed above the water, and a minute later the shine of the mackerel showed, and then the whole school, including thousands of fish, rose in a body to the surface, beating the water with their forked tails, and threshing in mad confusion from side to side.

The seine-master turned to the Fisheries official with a good deal of concern.

"That's a big haul," he said; "will your net stand it?"

There was no hesitation in the reply.

"Yes," he said.

"Then I'm willin' to admit," said the seine-master, "that you win. I'd never ha' believed that you could get as big a net as light as that an' able to hold the fish. That'll save us fishermen a pile o' labor."

But the official was not to be tempted into talk, even on the question of his own invention. He simply nodded, and went on pursing in. Presently the *Shiner* came pelting down the breeze, still carrying quite a bit of canvas, there being not enough hands on board to reef. The weather was getting dirtier every minute.

"Hello there the boat!" hailed the captain.

"All right," the seine-master called back. "A couple o' hundred barrels."

"Net holding?"

"Looks like it."

"Better get on board soon's you can," the captain advised; "we may have a bit of a blow."

Colin thought to himself that there was a great deal more than a "bit of a blow" at the time, but he said nothing. The worst of it was the way the rain came pelting down, for it was as thick as a fog, and dispiriting. It was a cold rain, too, and although it was September, the northeast gale was chill. Colin shivered in his oilskins. The pursing in done, the seine-master waved a torch, but it could not be seen in the rain.

"It's a good thing we've got a cap'n like Jerry on board, boys," said the seine-master. "He'll have to smell us out, because he can't see anythin'."

But it was a longer wait than any one expected, for the schooner had faded into the rain and could not be seen. Suddenly a hail was heard, and the *Shiner* passed to leeward of the boats, dimly visible. Every one shouted, and an answering cry came back.

"He'll beat up to wind'ard a bit an' then pick us up," said the seine-master cheerfully.

Colin wondered how any man could run a schooner about in a gale of wind and come back to a certain spot, but he need not have been incredulous, for in about five minutes' time the *Shiner* came sliding down as though to run over the boats, being thrown up into the wind in the nick of time. As the schooner settled beside the boat, all the men but two streamed aboard her, one remaining at the bow, to shackle the seine-boat to the iron that hung from the hook at the fore-rigging on the port side, while the other, grabbing hold of the long steering-oar, did his best to fend off the stern. The seine, thus being between the boat and the schooner, was held by Roote and the seine-master. Colin climbed aboard with the rest of the men, and within two minutes' time, the big dip-net—which would hold a barrel at a time—was scooped in among the fish.

Ten or eleven times the dip-net had descended and come up full of fish, and the work was proceeding rapidly in spite of the pitching and heaving of the vessel, when suddenly every one was stopped by the long wail of a foghorn near by. Not a sound of one had been heard before, and all hands were so busy that the direction from which the sound came had not been noted. Exactly half a minute elapsed.

Then mournfully and very close, the long "Who-o-o-o" sounded almost upon them, and the captain sprang to the wheel. As he set a hand upon the spokes and spun them round, a tall gray ship towered above them from the side on which was the seine-boat, and seemed to hang poised a moment on the crest of a sea before the final crash. Colin, who was leaning over the rail watching the dipping of the net, was able to see everything. The fisherman at the bow of the seine-boat jumped for the boom and clasped it safely. Then, as the sailing vessel lurched upon them, the boy noted that the seine-master and the fisherman at the stern of the seine-boat leaped for the

martingale shrouds and held them.

But that instant's delay, as the bark had seemed to be poised upon the wave, had been enough for the *Shiner*. Having her canvas up, the fraction of time gave her the chance to answer to her helm, and she spun round like a teetotum, seeming almost to wriggle from under the bow of the ship like a live creature. Roote, the only one left in the seine-boat, had been the last to see the oncoming ship. He gave one quick look upward, and plunged from the seine-boat into the sea. Even so, the chances were in his favor, but as he touched the water the ship crashed into the seine-boat, and a piece of the wreckage hit him on the head.

It all happened in a flash, but at the instant that he was struck, Colin, still in his oilskins and sea-boots, dived into the water. Fortunately, he cleared the vortex. In a few seconds Roote came up, and Colin grabbed him by the hair. The statistician was insensible, which made matters easier for the boy. But the oilskins and sea-boots were an impossible load, and it was only by great exertion that he managed at last to get them off and still keep Roote afloat. Soon after this relief, too, the statistician showed signs of life, and after successfully fending off a struggle, Colin succeeded in getting the injured man to rest his weight on him in the least tiring manner.

"I don't swim much," said the net expert. "How about you? How long can you keep afloat?"

"Long enough twice over for them to find us," said Colin cheerfully. "I'm a regular fish in the water."

But the boy soon found out that it was a far different thing swimming under normal conditions and really having to battle for his life in a fair seaway. Roote, too, soon relapsed once more into unconsciousness, and the boy had to support his weight. He was a swimmer, a champion swimmer, and it was rather a shock to him to find how difficult it was even to keep afloat. He realized how valueless a casual knowledge of swimming would be for use in the open sea.

He had not been more than half an hour in the water when his strength began to fail. He swam around expecting to find some piece of wreckage which would aid him, but not a thing could he see. His arms grew heavy and his feet hung down as though leaded weights were fastened to them. Black spots began to dance before his eyes, and Roote's weight became a torture. But he still hung on and kept afloat.

An hour passed of buffeting with the sea, and the boy began to grow light-headed. He had swallowed quite a little salt water, and presently he began singing, although he had a feeling as though a double self told him not to sing. A choking took his throat and startled him into full consciousness. He had nearly been down that time! But the training of years stood him in good stead now that he needed it, and he still swam on.

Then he began to dream. Once or twice he came to himself and smiled sadly to think that this was the end of all his hopes in the Bureau of Fisheries, but this consciousness did not last for more than a minute before he fell dreaming again, still, however, swimming heavily and keeping afloat. And it seemed to him that the last and the most real of his dreams was that a boat came by. But this, he thought, must be drowning and it was not hard to drown, to dream of being rescued and to go down, down, down, to the cold, strange tideless depths of sea from which no one ever comes up alive. Still, there was the boat in his dream, but it had come too late, and it seemed to Colin, that with his last effort he pushed Roote toward the outstretched arms of the men in the boat, waved a feeble farewell and sank. The water gurgled in his ears, there was a horrible strangulation, he tried to cry out, his lungs filled with water, and he knew no more.

Hours passed. Then, with a sense of suddenly arriving from a far-off place, Colin opened his eyes. He was in the cabin of a ship, and despite his exhaustion, he tried to rouse himself at the sound of voices. Roote, and another man, the captain of the bark, were standing beside his bunk.

"He's a plucky youngster, as well as a great swimmer," he heard the captain say. "Who is he?"

And Colin heard the other reply, with a note of pride in his voice:

"That's Colin Dare. He's one of our men. We think a lot of him in the Bureau of Fisheries!"

And the boy, wanly, but happily smiling, fell into a deep but healthy sleep.

THE END

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