



Ocean on Top

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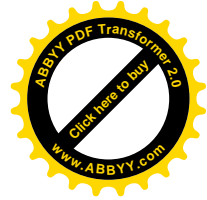
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Chapter One

I've never met a psychiatrist professionally and don't much want to, but just then I rather wished there was one around to talk to. It wasn't that I felt like cracking up; but when you have something profound to say, you like to have it appreciated, and it would have taken a professional really to appreciate the remark I wanted to make at that moment.

There's a word for people who can't stand being out in the open with crowds staring at them, and there's another one for those who get all in a dither from being cramped into a small space. They're both common enough ailments, but I would have liked to place a bet that no one before had ever suffered from agoraphobia and claustrophobia simultaneously.

With a name like mine, of course, I've never exactly sought the public eye, and usually I resist the temptation even to make bright remarks in company. Just then, though, I was wishing there was someone to hear that diagnosis of my feelings.

Or maybe I was just wishing there was someone.

I couldn't hear the storm any more. The *Pugnose* had broken up almost where she was supposed to. She had hit the heavy weather just where the metro office had said she would, and her fuel had run out within five minutes of that time - *that* even I could have predicted; trust a Board boss to make sure that no more stored energy than could possibly be helped went down with her. There was some battery power left, though, and I had kept a running Loran check until she drifted as close to Point X as she was going to. This turned out to be about half a mile. When I saw I was going on past the key spot I blew the squibs, and poor little *Pug-nose* started to come apart amidships.

She'd never been intended for any other purpose, and I hadn't fallen in love with her as some people might have, but I didn't like the sight just the same. It seemed wasteful. I didn't spend any time brooding over it, though. I ducked into the tank and sealed it and let nature take its course. By now, if static pressure instruments could be trusted, the tank and I were eight hundred feet down.

It was very, very quiet. I knew water was going by because the depth was increasing about two feet a second, but I couldn't hear it. Any loose pieces of the boat were long gone, floatables being scattered over the Pacific and sinkables mostly preceding me toward the bottom. I'd have been disturbed as well as surprised to hear anything solid bump against my particular bit of wreckage. The silence was good news, but it still made me uncomfortable.

I'd been in space once - a waste investigation at one of the Board's fusion research stations - and there was the same complete lack of sound. I hadn't liked it then; it gave me the impression that the universe was deliberately snubbing me until the time would come to sweep up my remains. I didn't like it now, though the feeling was different - this time it was as though someone were watching carefully to see what I was up to and was trying to make up his mind when to do something about it. A psychiatrist wouldn't have been much help with that notion, of course, because there was a good chance that it was true.

Bert Whelstrahl had disappeared in this volume of water a year before. Joey Elfven, as competent an engineer and submariner as could be found on Earth, had been lost track of ten months later in the same neighborhood. They were both friends of mine, and I was bothered by their vanishing.

Six weeks ago, Marie Wladetzki had followed the other two. This was much worse from my point of view. She was not an investigator, of course - the Board, as personified by its present boss whose name I'll leave out of this account, doesn't believe women are objective enough — but that didn't mean she couldn't be curious. Also, she'd been as interested in Joey as I was in her. Being Marie, she hadn't actually broken the letter of any regulations when she took out a Board sub at Papeete, but she most certainly strained the spirit of most of them. She hadn't said where she was going and had last checked in between Pitcairn and Oejo a thousand miles from where I was now sinking with the remains of *Pugnose*; but no one who knew her had any doubts about where to look first.

The boss was human enough to volunteer me for the look-see. My own inclination would have been to do just that — take a sub and see what had happened; but brains won out. Bert's disappearance could have been an accident, although there were already grounds for suspicion about the Easter Island area. Joey's vanishing within half a dozen miles of the same spot *could* conceivably have been coincidence — the sea can still outguess man on occasion. After Marie's loss, though, only a very stupid person would have gone charging into the region any more obviously than he could help.

Therefore, I was now a thousand feet below the top of the Pacific and several times as far above the bottom, camouflaged as part of a wrecked boat.

I didn't know exactly how much water was still below me; even though my last fix on the surface had



been pretty good and I'd acquired an excellent knowledge of the bottom contours north of Rapanui, I couldn't be sure I was going straight down. Currents near an island are not the smooth, steady things suggested by those little arrows on small-scale maps of the Pacific.

I might, of course, have tried echo-sounding, but to control that temptation I had no emission instruments in the tank except floodlights; and I had no intention of using even those until I had some assurance that I was alone. See without being seen was the current policy. The assurance would come, if ever, very much later, after I had reached the bottom and spent a good, long time listening.

In the meantime I watched the pressure gauge, which told how the water was piling up above me, and the sensors which would let me know if anyone else was using sonar gear in the neighborhood. I wasn't sure whether I wanted them to react or not. If they did, it would be progress; I'd know someone was down here who shouldn't be - but it might be the same sort of progress the other three had made. It might not be grounds for too much worry, since fifteen or twenty feet of smashed hull would show on any sonar scope for just what it was, and supposedly the tank inside would not. Of course, some sonarmen are harder to fool than others.

I could look out, of course. The tank had ports, and a couple of them faced the opening where *Pugnose's* stern used to be. I could even see things at times. There were flecks of phosphorescence drifting upward and streaks of luminosity not quite bright enough to identify in color which sometimes whipped past and vanished in the gloom and sometimes drifted for minutes in front of a port as though they marked the position of something which was trying curiously to look in. I was tempted - not very strongly, but tempted - to turn on my lights once or twice to see what the things were.

The wreckage was tumbling slowly. I had been assured that this wouldn't happen — that weight had been distributed so that the sharp prow would always point down and leave the tank on top when I hit bottom - but there was no one to complain to. There also seemed to be nothing to do about it, and I began to wonder just what I could accomplish if the tank wound up in bottom ooze, or even on hard rock, with the wreckage on top of it. The thing had little enough maneuverability as it was. With very much extra weight, dropping ballast might not be enough to start me back toward the surface.

I couldn't shift my own weight enough to affect the tumbling at all. The tank's inside diameter was only about six feet, and much of that volume was taken up by fixed apparatus.

Some of my friends have shown a tendency to solve problems by doing nothing until the last possible moment. I've outlived most of them. Once I'd noticed the tumbling, it took me about five seconds to run through the possible actions. I could cut loose from the wreckage right now, exposing the nearly spherical form of the tank to anyone who was watching with a good sonar — though no one had been so far. I could turn on the lights so as to see the bottom before I hit and, hopefully, still separate in time if it proved necessary; that would also be inconsistent with the concealment plan. I could sit and hope I would land in the right attitude in spite of the tumbling - that is, do nothing. That might mean that I would have to argue for my life with the laws of nature, which are harder to convince than most human opponents.

The first two choices meant — well, maybe Bert and Joey and Marie were still alive. I reached for the light switch.

I didn't touch it, though. All of a sudden I could see the bottom anyway.

At least, it looked as though it ought to be the bottom. It was in the right direction - I could still tell up from down -and it seemed flat. And it was visible.

Chapter Two

I didn't believe it, of course. I'm a very conservative person who likes even his fiction realistic, and this was too much to swallow. I had to stop reading *The Maracot Deep* when I was young because it described a luminous ocean bottom. I know Conan Doyle had never been down and needed the light for story purposes and didn't have very high standards of consistency anyway, but it still bothered me. I knew he was wrong for the same reason everyone does — the bottom just isn't bright.

Only now it was.

The tumbling wreck was swinging me upward away from the light, and I had time to decide whether I should believe my eyes or not. I could still read instruments. The pressure dial gave a direct depth of four thousand eight hundred eighty feet; a quick mental correction from the record tape of the thermograph added another two hundred or so. I certainly *should* be near the bottom, somewhere on the northern slopes of the mountain whose peaks are Rapanui.

I swung gently over the top and back down the other side, and my line of sight pointed downward



again. Whether I wanted to believe my eyes or not, they insisted there was light in that direction. It was a gentle yellow-green glow — just the sort of thing you use in lighting effects to give the impression of an underwater scene. At first it looked uniform and smooth; then, a few turns later and two hundred feet lower, it showed a pattern. The pattern was of squares, with their corners just a little brighter than the rest of the area. It didn't cover the whole bottom; its edge was almost below me, and it extended toward what I thought was the north, though my compass wasn't reacting too well to the tumbling. In the other direction was the normal comforting and frightening darkness - *that* was real enough. Two things happened at almost the same instant. It became evident that I was going to come down pretty close to the edge of the light area, and it also became obvious what the light area was. The second realization got to me. For three or four seconds I was so furious and disgusted that I couldn't plan, and as a result I almost didn't get around to telling this story.

The light was artificial. Believe it if you can.

I realize that for a normal person it's hard. Wasting watts to light up the outdoors is bad enough, but sometimes it's a sad necessity. Spending power to illuminate the sea bottom, though — well, as I say, for a few moments I was too furious to think straight. My job has brought me into contact with people who were careless with energy, with people who stole it, and even with people who misused it; but this was a brand-new dimension! I was lower now and could see acres and acres of light stretching off to the north, east, and west until it blurred out of sight. Acres and acres lighted by things suspended a few yards above the level bottom, things visible only as black specks in the center of slightly brighter areas. At least, whoever was responsible for this display had some sense of economy; he was using reflectors. Then I got my anger under control, or maybe my fear did it for me. I suddenly realized that I was only a few dozen yards above the lights. I was not going to come down among them, but a little to the south. I couldn't say *safely* to the south. I couldn't say *safely* anything, because my assemblage of *Pugnose*-bow and safety tank was turning over slowly enough to let me predict the attitude it would have when it hit bottom, and it looked pretty certain that the open end of the hull would be underneath.

Quite aside from the fact that I wouldn't be able to see anything from under the wreckage, there was the likelihood that I wouldn't be able to do anything either - such as get back to the surface. This time I did reach the controls.

Since the whole idea hinged on concealment, the separators used springs rather than squibs. I waited until the spin put the hulk between me and the light and punched the button. The push was light enough to make me wonder for a few seconds whether I mightn't be in even worse trouble than I'd supposed. Then light began to come in through ports which had been covered by the hull, and that worry ended. The springs had kicked the tank away from the lighted region, so I could see *Pugnose's* bow outlined against the luminescence. The separation had slowed our fall very slightly with the wreckage now going just a trifle faster than I was. At least something was going as planned; the wreck would hit first, so there should be no chance of my getting trapped under it.

I hadn't expected to see it hit bottom, of course. I would certainly never have expected to see what happened when it did.

For the most part, level stretches of sea bottom tend to be on the gooey side. They may call it globigerina ooze or radiolarian ooze, but it's usually ooze. You can meet with coral and sand and other firm stuff in shallow water and honest rock at times on slopes, but where it's level you expect something like a cross between ordinary mud and the top couple of inches of a stagnant pond. When something hard and heavy lands on it, even gently, you don't expect the bottom to give it much support. You may sometimes be surprised on this matter, but you never count on anything bouncing off the sea bottom.

Pugnose didn't exactly bounce, I have to admit, but she certainly didn't behave properly. She hit the lighted surface thirty or forty yards from the edge, and perhaps twice as far from me. I could see easily. She touched, as expected, and sank in as expected. There was no swirl of silt, though -no sign of the slow-motion splash you normally see when something lands in the ooze. Instead, the bow section disappeared almost completely into the smooth surface while a circular ripple grew around it and spread away from the point of impact. Then the wreckage eased gently back up until it was half uncovered, then back down again, still in slow motion. It oscillated that way three or four times before coming to rest, and each rebound sent another ripple spreading out from the spot for a dozen yards or so.

By the time that stopped, so had my tank. I felt it hit something hard - rock, for a bet, and I'd have won. Then it began to roll very, very gently toward the light. I couldn't see the surface I was on at all clearly, but it seemed evident that it was a solid slope which would deliver me beside the *Pugnose* in two or three minutes if I didn't do something about it. Fortunately, there was something I could do.

The tank had what we'd come to call legs, six-foot-long telescoping rods of metal which could be extended by springs and retracted again by solenoids. I was still hoping not to have to use magnets, but it seemed that the legs were in order; I propped out four of them in what I hoped were reasonable



directions. Enough of the guesses were right to stop the rolling, and for the first time I had a steady observing platform. Naturally, I concentrated on the area I could see.

I was now below the level of the lights themselves. They appeared to be strung on lines at intervals of about twenty yards, with the same spacing between lines. That was a guess, though, since I couldn't actually see any supports. Their regularity bolstered the guess, though the fact that the wreck had come down just about on a line between two of the lights without appearing to disturb them counted rather against it. I wasn't too surprised to see nothing growing or moving on the flat surface they illuminated, though of course I wouldn't have been surprised to see a few tracks or holes scattered around.

At least, I wouldn't have been surprised at them if I'd not seen the *Pugnose's* landing. With that to go by, it was perfectly clear that whatever I was looking at was not sea bottom. It was more like a rubber sheet stretched like a tent roof over everything more than about ten feet down slope from me. The wreck had dented it but hadn't punctured it, and the stuff was strong enough to hold up the comparatively small submerged weight of metal and plastic.

This, I reflected, could be useful. I had no idea why whoever was under the tent wanted to light up the outside, but unless the fabric were completely opaque they could hardly help seeing the shadow and the dent in their ceiling. That should bring people to investigate, and they would be easy to see without my having to use lights of my own and giving myself away. All I needed was one clear view of unauthorized human beings at the bottom of the Pacific; that, plus the scale of energy wastage I could already detail, would be all my report would need - a major control expedition would do the rest. No one expected me to arrest a group large enough to set up an installation like this, and I had no ambition that way either. To put it mildly, the tank wasn't maneuverable enough to serve as a police car; I was in no position to arrest a passing shrimp. All I asked was a good look at a work sub, or a suit of pressure armor, or even a handling robot under remote control - anything that would show that this setup was being actively managed — one good look, and I'd be ready to drop ballast.

I wouldn't do it too hastily, of course, for two good reasons. A sonarman might reasonably dismiss a sinking object as a piece of a wrecked ship, or even a dead whale, and not be too curious; but he would be most unlikely to feel the same indifference toward something rising. I'd have to take some time to evaluate the sonar danger. It was nice, but not conclusive, that there had been no sign of it so far.

The other reason against haste I didn't know about yet, and didn't learn for a number of hours.

I'm not a clock-watcher. I knew I had plenty of survival time in the tank and wasn't keeping very close track of how much of it had passed. When the second reason did show up it never occurred to me to check the time, and for several hours after that I was very thoroughly distracted from such things as clocks. I can't say, therefore, just how long I spent sitting in the tank waiting for something to happen. I can guarantee that it was a number of hours; long enough to get me bored, cramped, irritated, and more than half convinced that there was no one under that tent roof anywhere nearby. The idea that it might be someone who didn't care a hoot about fragments of ship in his ceiling seemed too far out to be worth considering, "if anyone had seen it, he'd have done something about it.

No one had done anything about it. Therefore, no one was within sight. And if no one was within sight under the fabric, I might as well take a closer look at it myself. Maybe I could even get a look under it. Dangerous thinking, boy. Don't let all those wasted kilowatts go to your head. You're just a detached eyeball; if you don't get back with information, anything you *do* manage to do is pure waste — and waste, of course, is the profane word around the Board.

It *was* a temptation, though. No motion - no sign of human life except the lights and the tent roof itself, and mighty little sign of any other kind of life. No sound. Nothing from the sonar frequency monitor. Why shouldn't I roll gently down to the edge of the fabric and study it more closely?

The best answer to that question, of course, was that it would be the act of a dithering idiot. As time went on, though, it occurred to me once or twice that merely being here at all wasn't the highest possible display of human intelligence. If I must act like a fool, I might as well be a real one. I don't know where that sort of thinking comes from; maybe I *should* see that psychiatrist.

I'm not sure just how close I came to giving in. I know I *almost* pulled in the legs three times and each time thought better of it.

The first time I was stopped by something moving, which turned out to be a fair-sized shark. It was the first large living thing I'd seen since reaching bottom, and it set my thoughts off on another tangent for a while. The next couple of times I started to move the tank I was stopped by the memory of the shark; it had disappeared - had it heard something I couldn't, that had frightened it off? I had no instruments outside for low or audible frequency detection, just the sonar receptors.

I know all this isn't making me sound much like a genius, or even a reasonably competent operator. I wish I'd had more time to edit my memories a bit before having to tell this story. If I'm to justify the decision I'm trying to sell, I should have some chance to look like a sensible adult first. All I can put in for my own defense at the moment is one of those let's-see-you-do-better remarks. Are you sure just



how your own thoughts would have gone if you were practically helpless in a six-foot plastic bubble a mile under the ocean? If you're not, please suspend your criticism until I'm done.

The second reason for not dumping ballast too hastily finally did show up. My attention was still pretty well focused on the wreckage, so I didn't see it coming. My first glimpse was from the corner of my eye, and I thought for an instant it was another shark; then I realized it was human, and I had my evidence. Fine. Once it's out of sight I can head for the surface.

Not a chance. What I needed was convincing evidence, and if my own eyes weren't convincing me it was unlikely that my words would convince anyone else. What I saw was a person, which was all right in itself; a suit of four-inch polyphase armor, adequately powered in the limbs, will hold back the ton and a quarter or so per square inch that sea water exerts a mile down. Such armor will even let the wearer look rather like a human being and move about in a very clumsy walk.

It will not, however, unless he is immersed in an ocean of mercury, let him swim; and this clearly human figure was swimming.

It came into view some distance to my left, appearing in the light rather suddenly as though it had come down from the darkness above. It was swimming toward me and the wreck, not in any obvious hurry. As it approached, details became plainer; and the plainest of all - plainer even than the fact that it was female — was that she wasn't wearing armor. She was wearing a cold-water coverall type scuba suit, absolutely ordinary except that it had a spherical, transparent helmet instead of a breathing mask, and the ballast seemed to be in rings here and there around body and limbs instead of being fastened to the belt. I repeat — in fact, I had to repeat it to myself several times — that the garment was not pressure armor. Its wearer's swimming motions showed plainly that it was nearly as flexible as ordinary skin, just as a scuba suit should be.

She didn't seem to see my tank, which was some relief. She didn't even seem to see the wreck until she was within twenty yards of it. She had been swimming very slowly along the edge of the tent roof with no more apparent purpose than someone out for an afternoon stroll, up to that point. Then she changed course and headed straight for the bow of *Pugnose*.

That didn't fit. Anyone down here should have been looking for that wreck, not running across it by accident. I'd been expecting a working party sent out by the people under that cover.

Well, there's more than one thing I haven't been expecting about this business. Stop with the working hypotheses, brother, you haven't enough data even for that yet. Just watch (I don't even address myself by name).

So I watched. I watched her swim around the shattered bow, and into it and out again, and over it. Then I watched her unlimber an object which turned out to be a light, which had been clipped to her suit belt, and swim inside once more. That worried me a little; the camouflage for the tank had not been designed for that sort of inspection. Its clamps, its launching springs -

She came out again, with no more visible signs of excitement than before, and at that point something else dawned on me. It was a very minor point compared with what I had already seen - at least, it seemed minor when I first noticed it; as I thought, it became more and more a major puzzle.

Her scuba suit was, as I said, quite ordinary except for helmet and ballast. Its ordinariness included a small tank between the shoulders, whose upper end just touched the helmet and was presumably connected with it, though I could see no piping. All this was reasonable. The jarring note was that there were no bubbles.

Now, I'm familiar with rebreather systems, and I know about chemical supplies - mixtures of alkali metal peroxides and superoxides which react with water to give free oxygen and pick up carbon dioxide. I know them well enough to know that they must have, besides the chemical container and mixer systems, a sort of 'lung' - a variable-volume, ambient-pressure gas bag or tank - with the supply chemicals between it and the user's own lungs. The exhaled gas has to go somewhere until it's ready to be inhaled again. That 'lung' must have a volume great enough to take all the air a swimmer can exhale at one breath - in other words it must have as much volume, or nearly as much, as his own inflated lungs. There was no such bag visible on this swimming outfit, and the back tank was not nearly large enough to have contained one. It seemed, therefore, that the unit did not involve a chemical oxygen supply; and unless some sort of microscopic pump was taking the gas as fast as she exhaled and squeezing it back into another part of that little tank at fantastically high pressure, there should be exhalant bubbles. I couldn't see any reason for such a recovery system, but I couldn't see any bubbles either. I had already been bothered about what gas mixture she could be breathing - at this pressure, half of one percent oxygen would have burned her lungs out, and there was nothing I knew of which could be used to dilute it. Even helium was soluble enough down here to make decompression a job of many hours.

It crossed my mind for a moment that people might be living permanently under this pressure, breathing a nearly pure helium atmosphere with a fraction of a percent oxygen in it; but if that were the



story, I still couldn't see why that girl's suit didn't give out bubbles. Granted there might be every economic reason to recover helium, there are engineering problems which I still don't think could be completely solved.

No. All hypotheses inadequate. Keep on observing. Facts so far are only that she seems to be living and moving normally in a closed system at outside pressure, and that the pressure in question — skipping the old superstition about flattening a human body — is quite high enough to mess up any biophysical or biochemical processes involving gas dynamics.

There wasn't much more to observe, though. The girl clipped the light back on her belt, took a last glance at the wreckage and began swimming away from it. She didn't go back the way she had come, but continued on to my right, slanting away from the lighted region. In a few seconds she had disappeared, though I knew she couldn't be very far away yet.

It seemed likely that she was off to get help in moving the wreck off the tent roof. How long before she would be back with it was anyone's guess. There might be a tent entrance a few hundred yards away, or there might not be one for several miles. The former seemed a trifle more likely, but I wasn't going to risk money on the question.

Just my future.

She *might* have noticed the gear that had held and launched my tank; she wouldn't have had to be much of an actress to hide an expression of suspicion under the circumstances. If she had noticed and reported it, those who came with her were going to be very curious about the whole area. The outside of the tank was deliberately a little irregular in outline so that it wouldn't be too obviously artificial, but it was not going to fool anyone who took a really good look at it. Maybe it would be better if I moved a little farther away. I wasn't concerned with personal safety; I could always get away, but I wanted to see as much as possible before that became necessary.

So I told myself.

Moving would be a slow process; traveling ability was not really a design feature of the tank. There were two dozen of the legs, and I had enough stored power to retract them against their springs several thousand times (that had taken argument), but I had not been born a sea urchin. I had had a little practice rolling the thing around under water, but the purpose of the rig was to let me juggle into a better observing position, not to keep out of the way of searchers. If I were found, my only real recourse would be to drop ballast and start for the surface. That was a once-only operation, and I didn't want to resort to it before I really had to. There was still some hope, I figured, of deciding what was going on down here in some detail.

Maybe it's courage, or maybe just natural optimism.

Chapter Three

I began working the legs, hoping that no instruments in the neighborhood were recording the D.C. pulses as I turned the retraction solenoids on and off. I had found during practice that I could climb a slope of five or six degrees if the bottom were hard enough to give the 'feet' any resistance, but that near the limit of steepness the going tended to be tricky. If I overbalanced and started downhill again it took very fast work with just the right legs to stop the roll. The sphere had a respectable moment of inertia. Because of its outer irregularity, some positions were naturally more stable than others, and some were much less. Just now I was wishing that I had spent more time in practice, though I consoled myself with the thought that the boss wouldn't have authorized the energy expenditure anyway.

I had worked my way between thirty and forty yards farther up the slope, with only one mistake that cost me any real distance, when the party I expected showed up.

It wasn't a large one — four in all. One could have been, and probably was, the girl I had seen before; the other three seemed to be men, though it was hard to tell at this greater distance. One of the new ones was towing a piece of equipment about three feet long, cylindrical in shape, and a little more than a foot in diameter. It had a slight negative buoyancy, which was understandable - they'd make sure that nothing which got loose would find its way to the surface.

They swam over to the wreck, and two of them began pulling lengths of line from the cylinder. They attached these to convenient parts of *Pugnose*, while the third man pulled from the other end of the cylinder something that looked like a heavy bundle of netting with a collapsed balloon inside it. When the other lines were made fast he manipulated something on the cylinder, and the balloon began to inflate slowly. The wreckage didn't have much submerged weight, and it wasn't long before the balloon had it hoisted clear of the roof. Then all four of them got on the far side and began pushing it, swim



fins fluttering violently.

It took them several minutes to get it away from the smooth area and out of the light. I supposed this was all they'd bother to do, but I was wrong. With the tent roof out of danger they moved around and began pushing the load in the direction the girl went after finding it.

This might be a nuisance. Maybe they just wanted it for a souvenir, but maybe they wanted to make a really close examination under better conditions - better light, or maybe even out of water. Whichever of these might be true, as long as they were interested someone was likely to notice the tank attachments. I'd have been much happier if they'd simply pushed the bow section off their roof and forgotten it. Now I had no excuse for not following them. Come to think of it, I should try to locate the entrance, or one of the entrances, to the place anyway.

They weren't swimming fast, but they went a lot faster than I could roll the tank. Once again I wished that some real provision for moving the thing had been made, but the argument had been that the closer the whole rig got to being a submarine, the harder it was going to be to camouflage. I hadn't bought the argument completely at the time, and I would have been even more delighted at a chance to reopen it now. All I could do, though, was hope the chance would come later on, and in the meantime wait until the swimmers got their burden a reasonable distance away and then start rolling in the same direction. Perhaps I haven't made clear quite all the nuisances involved in rolling the tank. The principle ought to be plain enough; it was simply a matter of letting the appropriate spring push out a leg against the bottom, on the side I wanted to go away from. It may not have crossed your mind that this general method of getting around meant that living equipment, control panels, and other fixed gear were sometimes to one side of me, sometimes to another, and sometimes above or below. There were times when it was very hard to keep from sitting on all the leg-control buttons at once, for example. As I've said, the legs were meant more for position and altitude fine control, and to keep the tank from rolling on a slope, than for genuine travel. The need for the latter had not been foreseen, or at least hadn't been considered very great, by the authorities.

At least, concentrating on working the machine along the bottom kept my mind from the worries I'd felt on the way down. It was actually more likely now that I'd come under unfriendly observation, but at least I wasn't brooding over it. The swimmers had vanished in the distance, nothing else could be seen moving in the lighted area to my left, and nothing at all could be seen the other way. The bottom under the tank couldn't be made out in detail, and in a way I was groping along - though the verb isn't exactly right, since it implies that you can feel what's ahead of you. I couldn't feel anything; I could only note whether my vehicle rolled a little way, a longer way, or not at all whenever another leg was extended. When it didn't roll at all I had to guess which other legs to try. It would have been a lot easier if I had dared to use enough light of my own to get a decent sight of the bottom, but I wasn't that silly. If the local population included swimmers, I didn't have a prayer of knowing when any of them were around; when this mess had started we were thinking of subs and sonar. These I was ready to spot. The slope was not very regular, as I quickly found. Twice I rolled forward out of control for several yards when I reached a small dip. Once I thought I was stuck for good - I couldn't go forward, back, or what was presumably downhill toward the light. As a last resort I tried uphill and found that it wasn't uphill at all; I rolled out of control again into a hollow where I couldn't see the lighted area except as a vague, diffused glow over the ridge I'd just crossed. Getting out of that hollow used a lot of time and an irritating amount of stored power.

I couldn't even relieve my feelings with language. The coupling from air through plastic to water, and from water through helmets to gas and human ears, may be pretty bad, but it isn't zero; and the sound-transmitting properties of cold water make up for a lot of matching deficiencies. I didn't dare say a word.

Once out of that devil-invented gully I stopped, once more in full sight of the tent roof and tried to take stock.

My power was rather low. There was no way of telling whether I might reach the entrance in three hundred yards or three thousand; the former seemed more likely, since the girl hadn't taken too long to come back with her help, but then she might have met the men already outside. Nothing was certain enough to give any possible line of action even the dignity of a calculated risk. It wasn't possible to calculate.

I had to find out more, though. I'd cooled down a little from my original reaction - I could believe what I'd seen, and I realized that others would, too - but the news I had wasn't as helpful as it was supposed to be to the Board. If a police unit were to do anything but grope around, it should know where to start. A regular entrance would make a logical place. Of course it wasn't likely that the tent roof would really keep a sub out; but judging by the area the tent enclosed, the chances of breaking through at a strategically useful point would be rather slim.

Maybe the best thing to do would be to throw out the caution policy and turn on my lights. The extra



power would be offset by more efficient travel when I could see where I was going and I should stand a better chance of reaching the entrance before my juice failed entirely and automatically let my ballast go. If I were seen, no doubt some of the swimmers would come close enough to give me a really good look, so I might get a better idea of their high-pressure technique before I left.

I'm a cautious man by nature, and thought that one over for quite a while before I bought it. There was plenty against it, of course. Just because all I'd seen was swimmers rather than subs didn't prove there weren't any subs. If there were, there would be an excellent chance that I could never get back to the surface - but I'd accepted that risk before starting the trip. I ping-ponged the matter for several minutes. Then I took a good, deep breath on the theory that I might not get many more and turned on one of my spots.

It made a difference, all right. The bottom was mostly rock, as I'd suspected, and was very rough — no wonder I'd had trouble using my legs effectively. Able to watch what I was doing, I resumed travel and, as I'd hoped, made much better speed with much less power drain. It wasn't exactly easy yet; I was still rolling, and had to change lights as well as legs as I rolled, but the improvement was encouraging.

I could see more motion around me. There was a lot of small life — shrimps and their relatives - that I hadn't been able to spot before. They got out of my way without being too distracting. There were also plantlike growths, though considering how far they were from the nearest natural light it seemed likely that they were sponges or something of that sort. They neither helped nor hampered the rolling, as far as I could tell.

However, I was paying for the much better short-range vision with a much worse view of distant objects. I might have been surprised quite easily by a group of swimmers, but what actually happened was less predictable. I lost orientation.

Not in the compass-direction sense and not completely. I could still see the lighted area to my left, though not as well as before; my compass still worked, when it happened to be right side up; but my sense of up and down, depending more on my view of a few square yards of ocean bottom than on my semicircular canals, was fooled when some of the bottom ceased to be horizontal.

The change must have been gradual, or I'd have spotted it within the small area I could see well. As it was, I overlooked it completely; suddenly I was on an area of rock sloping much more steeply than any I had traversed up to then. Before I knew it the tank had started a stately roll to the left; after I knew it, leg after leg poked out in that general direction proved useless.

It wasn't like rolling downhill in a barrel; it was a slow and graceful motion. I could easily have stayed upright inside the tank if I'd chosen to concentrate on that problem instead of on the controls. For all the use I got out of the latter, I might as well have concentrated on comfort. Some of the legs may have slowed me a little, but none of them came close to putting a stop to the journey. I rolled helplessly into the lighted region and out onto the tent fabric. For several long seconds my report-making attention was divided almost equally between up and down.

Above me I could see the lights clearly for the first time. They were ordinary high-pressure, excited-vapor lamps, bigger than I'd ever seen used for general illumination, but otherwise nothing strange. I still couldn't see what held them in position, since looking up at them was hard on the eyes.

Looking down was harder on the imagination, though mine was getting a bit calloused. I already knew that the fabric was remarkably strong and elastic; I'd seen how it reacted to *Pugnoses's* bow, which must have had some pretty sharp corners here and there. I also knew that it was opaque, or at best translucent, in its normal state. I realised that the part now under my tank would be-stretched. But it hadn't occurred to me that stretching the stuff would make it transparent.

Chapter Four

When I stopped moving, however, I could see ordinary sea bottom - rock similar to the stuff I had been rolling across -under me. For a moment I thought something must have stopped me short of the tent roof after all, but glances through several of the ports killed that notion. I was nearly fifty yards out on the thing, sunk into it for just about half of the diameter of the tank. From ports above that level I could see the lights above and the smooth fabric below; from the lower windows I could make out rock and occasional patches of silt on the bottom and a greenish-white, evenly glowing ceiling above - evidently the fabric, lighted from the other side. It was translucent, then; but the part of it stretched around the lower half of the tank offered no interference at all to vision. Some of the legs were extended on this side, and the stuff seemed to have spread in an invisibly thin layer over these as well - they could hardly have punctured it or I wouldn't have been hanging on the roof. Someone must have done some



very fancy work in molecular architecture, I decided - which shows how a wildly wrong set of premises can at times give rise to a correct conclusion.

But why the tent at all? The sea bottom under it looked no different from that above. There was no sign of any human being or artificial structure in the region below. There weren't even any living beings that I could see, and I certainly looked hard - it occurred to me for a moment that someone might have gone so far with the energy-wasting business as to try growing natural foods with artificial light. The idea at least went along with indifference to ordinary morality about energy; people who'd shine all those kilowatts into the ocean probably wouldn't boggle at overreaching their fair share of area in order to grow mustard or something like that. The sea bottom was about the only place on Earth where such a trick could be pulled without being caught right away by indignant neighbors, to say nothing of the Board. The only trouble with the theory, other than one's natural reluctance to believe in such people, was that I couldn't see anything growing. For that matter, I didn't know what sort of food plant could be grown under sea water. There were some, no doubt; and if there weren't natural ones, there is always gene tailoring.

A more immediate question was what to do next. Thirty seconds of trying proved that I could extend and retract my legs until the power cells ran down without moving the tank at all. They just didn't have anything to push against; the bottom was a little too far down. I tried rolling the thing by shifting my weight. This worked as far as turning the tank over was concerned, but didn't get me noticeably closer to 'shore'. It seemed that the only freedom of motion I had left was upward.

This was a little annoying. I had planned to plant a small sonar transponder near the entrance when I found it, as a guide for the police boats. If I dropped it here, it would mean very little and furthermore would be seen lying on the tent fabric by the first person who happened to pass, either above or below. If I'd had the reaction time and foresight of a fictional hero I might have let one go when I realized I was out of control; but I hadn't, and there was no use moaning about it.

I might wait until they found the tank and just hope for a chance to drop the instrument without anyone's noticing while they were carting me off, but that seemed to involve a historical record for optimism.

I couldn't accept the idea of going back to the surface without leaving it, though, even though that and all the other things it would be so nice to get done seemed to be impossible. Even a snake on a tray of oiled ball bearings keeps wriggling.

And so I remained. There was really no point in an early departure anyway. I still had plenty of oxygen, and there was always the hope that I'd get a useful idea before they - whoever 'they' were - found me. The hope lasted for nearly six hours.

It wasn't a girl this time, though it might possibly have been one of the same men. He wore the same sort of swimming outfit to the last detail, as far as I could see. He was swimming straight toward me when I first saw him, above the tent roof as the others had been, slanting out of the darkness from the direction I supposed the entrance must lie. Certainly he had seen me, or rather the tank. I wished I had spotted him earlier - it would be interesting, and might even be useful, to know whether I had been found accidentally by a passing swimmer or by someone deliberately checking the region where the wrecked boat had been found. However, I could be philosophical about not knowing. I watched as he swam overhead.

He should be able to recognize the tank without much trouble. It had a lot of nonstandard equipment fastened outside, but it was basically a regular emergency high-pressure escape tank of the sort you'd find in any large submarine - a sphere of silica fiber and high-stress polymer able to stand the pressure of two miles of sea water. It was light enough to float, ordinarily, but the jury-rigged thing I was in was well ballasted. Besides the legs and their accessory gear there were the lights, the transponders, sundry pieces of sensing equipment, and several slabs of lead so distributed as to keep the center of buoyancy and the geometrical center as close together as practical. The lead made the real difference; I would still float with all the rest.

The swimmer stopped stroking as he glided overhead and drifted, settling slowly toward me. I could see his face now through the helmet - in fact, the helmet itself was barely noticeable; he might almost have been swimming bareheaded. He was no one I could remember ever having seen before in five years, of Board work, but I took good note of the line of his black hair, the set of his eyes, and the squarish outline of the rest of his face so as to be sure of knowing him again if the chance ever came up. Presumably he couldn't see me; the view ports were small, my inside lights were out, and he showed no sign of the surprise I would have expected him to feel if he knew or guessed that the tank contained a living man.

He came close enough to touch the equipment - so close that I could no longer see everything he was doing. I told myself that it couldn't be anything very drastic, considering what the tank was built to take, but I'd still have been much happier if I could have seen his hands all the time. He was certainly



fooling with things; I could feel the casing quiver occasionally as he pushed something particularly hard.

He drew away again and swam twice more all around the tank, never taking his eyes from it. Then he settled down to the tent roof and pushed his head against it, as though he were trying to swim through. I didn't dare shift my weight quickly enough to look through one of the lower ports while he was still in that position, so I couldn't tell whether his helmet stretched the fabric enough to let him see through - it was, after all, a lot smaller than my tank. I did let myself down very gingerly, so as not to move my container noticeably, but by the time my eyes had reached one of the lower ports he had risen again - at least, I could see nothing against the fabric except his shadow. He seemed to have started swimming away, and I took a chance and straightened up quickly. The shadow had told the truth. He was heading back in the direction from which he had come.

This time I was much more careful with the clock. He was back with another man in just under eight minutes. His companion was carrying either the cylinder that had been used in moving the wreck, or one just like it; the first man was also carrying something, but I couldn't make out what it was right away. It looked like a rather untidy bundle of rope.

When he stopped above the tank and shook it out, however, it turned out to be a cargo net, which he began to work around the tank. Apparently he had decided on his first inspection that the natural irregularities of his find didn't offer much hold to a rope. I couldn't exactly blame him for that conclusion, but I very much wished he hadn't reached it. I wasn't sure how strong the net might be, but unless it were grossly defective in manufacture it would hold my ballast slugs. If it were fastened around tank and slugs both, releasing the latter would become a pointless gesture. It was definitely time to go, and I reached for the master ballast release.

Then I had another thought. Dropping the lead would presumably give my presence away, assuming they hadn't already guessed there was someone inside. That cat was out of the bag, and nothing else I could do would tell them any more. I might as well, therefore, try something else which might keep that net from enfolding me until I was over bare rock again and stood a chance of dropping the transponder effectively. There seemed nothing to lose by it, so I extended all the legs at once.

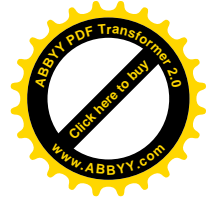
Neither of the swimmers was actually hit, but they were very startled. The one with the net had been touching the tank at the time, and may have thought that something he had done was responsible for releasing the springs. At any rate, neither of them seemed to feel that any more haste than before was needed, as they should have done if they'd suspected a man was inside. They simply went about the job of attaching the lifting device as they had to the other wreck; there were plenty of things to fasten lines to now that the legs were out, and it would have been hard or impossible to get the net around the new configuration. That was all to the good.

The technique was the same as before. I assumed the cylinder contained a chemical gas generator, considering the pressure the balloon was expanding against. That was just a fleeting thought, though. It was much more interesting to watch the two swimmers pushing me toward the edge of the roof even before my container had lifted entirely clear of the fabric. Things were certainly looking up; only two people, bare rock coming up - no, don't be too hasty; maybe they'll push you right to that entrance you want to find. Wait it out, boy. I pulled my fingers away from the panel, and locked them together for extra safety.

Just as had been done with *Pugnose*, the tank was moved away from the tent and then along parallel with its edge. The motion was slow - even with a weightless load there was plenty of water to push out of the way — and we were more than fifteen minutes on the trip. I kept watching for some sign of the entrance, expecting a break of some sort in the fabric itself, but that wasn't the arrangement I finally saw.

After a quarter of an hour my porters aimed away from the lights again and headed up the slope which I assumed was still to our right. About two hundred yards in this new direction brought us to the lip of another bowl or gully, apparently much like the one I had almost been trapped in a few hours before, but larger. The center of this depression was even more brightly lighted than the roof of the tent, and the entrance was in the very middle of the bright region.

I didn't take a very good look at it; I acted too fast. I glimpsed what seemed to be a smooth-walled pit about forty feet across with ladders going down at a couple of dozen points around its rim. Most of the light came from some point in the pit below my line of vision. Between me and the opening were a dozen or more swimming figures, and it was the sight of these that made me act. If I were to be surrounded by a whole school of swimmers, my chances of dropping a transponder unnoticed would be negligible; and without spending any more time in thought, I dropped the ballast and one of the sounders simultaneously. I instantly realized that might be a mistake, since each of the lead slabs was heavy enough even under water to smash the instrument, and as I felt the tank lurch upward I dropped another of the little machines. There was a good chance that my company had been distracted by the



ballast - a much better one than I realized, as I found later.

I heard the lead hit the rock. So, evidently, did the swimmers around the hole. It took them a few seconds to spot the source of the racket. A man judges sound direction partly from the difference in arrival time of the wave at his two ears; and with the high speed of sound in water, the fact that the disturbance was also being carried by the rock, and the helmets they were all wearing it was impossible for them to get more than a vague notion of where the sound had originated. When they did start coming my way it was in response to a flashlight which one of my carriers was shining toward them. The two original swimmers were hanging onto my legs - the tank's I should say. They couldn't hold me down, of course. It takes more than a couple of almost-floating human bodies to replace several tons of lead. They were staying with me, though, and guiding the others.

That didn't worry me at first, since there weren't enough people in sight to hold me down, and if there had been they couldn't all have found room to get hold. The only real cause for anxiety was the possibility that there might be work subs with outside handling equipment somewhere around. Even from these, though, I'd be fairly safe if they'd just put off their appearance for a few more minutes. They'd have to hunt me with sonar once I was out of sight, and I was beginning to feel pretty certain that the last thing this bunch would do was send out sonar waves. The darned things travel too far and can be recognized too easily. I still didn't know what these folks were up to, but there was enough obviously illegal about it to suggest that secrecy would be high on their policy list.

The ones who were holding on to me would have to drop off soon. There isn't an underwater breathing rig made that will let a man rise at three feet a second or so for more than a few hundred feet without running into decompression trouble. I didn't care what gas mixture these characters were breathing; there are laws of physics and human bodies have to obey them.

The more distant swimmers were turning back as this thought crossed my mind; I could see them against the fading background of the lighted pit. I could also see, poorly, the light which one of my hitchhikers was shining toward them. He seemed to have some hope still; maybe there *was* a sub in the neighborhood, and he was trying to stick with me long enough to guide it. Unless it showed up very soon, though, he was going to lose that gamble and kill himself in the bargain.

I saw another swimmer, quite close, dwindling between me and the light; my second passenger must have dropped off. When would the first go? His light was still shining, but it could hardly do any good now. I could barely see the pit, and surely no one down there could see his little flash.

Evidently he realized this, for after a few more seconds it went out. I expected to see him leave like his fellow, since he could do no more good by sticking, but he wasn't thinking along those lines. He had different ideas, and one of them from his viewpoint was a very good one. I didn't like it so much.

The dual-phase stuff they make pressure tanks out of isn't a metal, and differs widely from any metal in its elastic properties; but like metals, if you hit it, it makes a noise. I didn't know what my rider started hitting with, but it most certainly made a noise. I, from inside, can vouch for that. A nice, steady, once-a-second tapping resounded from the tank, hurting my ears and doing worse to my plans. He didn't need his light; any work sub could home in on that noise from miles away if it had even a decent minimum of instrumentation.

And there was no way that I could think of to stop him.

Chapter Five

I could try the legs, of course. I did. It was so dark by now, with the light from entrance pit and tent roof alike faded to the barest glimmer, that he may not even have known that I did anything. If he'd been holding on by a leg he may have been disconcerted when I pulled it in and maybe bruised when I popped it out again, but there was no evidence that anything of the sort happened. I ran the legs through their cycle several times without making the slightest change in the rhythm of that tapping.

I tried shifting my weight to make the tank roll over. It worked, but didn't bother my passenger. Why should it? A swimmer doesn't care whether he's right side up or not, and a submarine hitchhiker in total darkness should care even less. I was the only one who was bothered.

But why was this character alive, conscious and active? We'd risen more than a thousand feet now, through a pressure difference that should have popped his suit if it were really sealed as tightly as I had judged. If it weren't, and if he were valving off gas to keep his lung volume down, he was going to be in trouble when he descended again; and in any case, volume or no volume troubles, whether he was breathing helium or anything else, he should by now be completely helpless with embolisms.

The simple sad fact, independent of what *should* be, was that he was still going strong, and I had no



way of getting rid of him.

Nothing like this had been foreseen by the Board geniuses who had worked out this mission. There was not the slightest doubt that some sort of sub was going to be along shortly to pick me up - no other notion was sane, in view of the fact that this fellow had been fit to stick with me. There were always insane notions to consider, of course; maybe he had decided to sacrifice his life to make sure I didn't get back to the surface, but even that assumed the coming of *something*. Maybe a torpedo, but something. Personally I doubted the sacrifice idea. Lots of people will, for a cause they consider important enough, but I've never met a lawbreaker who acted that way. Especially I've never seen an energy waster who would; selfishness is the key word with those lads - keep the eye out for Number One.

But never mind the psychology; what's to be *done*? The guy may be a moving corpse, but he's still there broadcasting. Why didn't I come down in a work sub? Skip that question; it's a waste of good thinking time. How can I make him get off, or at least stop making noise?

Badly phrased question. I can't make him do anything. He's outside, and I'm inside, and with his pressure difference never the twain shall meet. Then, how can I *persuade* him to leave or shut up? Until I start communicating, I can't persuade him either. Obvious.

I put on my lights, both inside and out. That at least caught the fellow's attention; the tapping stopped for a moment. Then it resumed, but less regularly, and I caught glimpse's of him as he worked his way to a place which would let him see through one of the ports. I pulled my own face far enough back from it so that he could see me clearly, and for a few seconds we just looked at each other. The tapping stopped again.

It was the same man who had found the tank. I'm not a mind reader, but I felt pretty sure from his expression that he had only just realized there was anyone inside and that the discovery bothered as well as surprised him. He resumed his banging on the tank, in a much more irregular pattern. After a few seconds I realized that he must be sending some sort of code, though I couldn't read it.

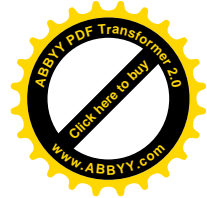
I tried to explain my gestures that the racket was hurting my ears, but all he did was shrug. If he cared at all about my comfort, it certainly wasn't at the top of his priority list. He finished his code message at last and resumed the regular tapping. He didn't seem angry - didn't scowl, or shake a fist at me, or anything of that sort, but he didn't look as though he considered me a long-lost friend, either. I could see his face clearly and without distortion through the helmet, but I could see no sign of real interest in his expression. I spent some time trying to get him to respond to my gestures, but he paid no attention. I thought of writing a note that he could read through the port, though I couldn't guess what languages he might know, and I managed to find some scraps of paper in one of my pockets; but I could find nothing to write with, and that idea collapsed. I finally gave up and turned my lights off again. There was no use in helping him guide the sub to us.

I couldn't think of any more practical plans, and my mind wandered back to the question of how the fellow lived. We had risen several hundred more feet during the time the lights were on, and his suit hadn't emitted a single bubble. I was beginning to wonder whether it really was an ambient-pressure unit. It was hard to see how anything so thin, and especially so flexible, could possibly be pressure armor; on the other hand, the peculiarities of the tent roof indicated that someone had been making progress in molecular architecture. I was in no position to say such armor was impossible, but I wished I could make at least a vague guess as to how it was done.

I can feel a little silly about it now, of course. I'd had the man in full sight, well lighted, only a few feet away from me for fully five minutes, and I missed the key fact - not in something I saw but in something I didn't see. At least, I'm not alone in my folly.

The tapping kept up. It wasn't really loud enough to be painful, but it was annoying, Chinese water torture style. It may have been equally so to the fellow outside who was doing it, and I got a little consolation out of the thought that at least he was having to work at it. I got a little more out of the realization that as long as he *did* keep it up the help he was calling hadn't arrived yet.

Two thousand feet was less than halfway to the surface, though it was an unbelievable pressure change for my hitchhiker. It wasn't very much comfort to me to know that I'd put that much water under me; even twice as much wouldn't be much help. It wasn't as though there'd be a police squadron standing by to pick me up, or even a single boat. The tank had only the normal automatic transmitters for calling help, and they wouldn't even start to function until I reached the surface — which I was unlikely to do. There probably was a Board vessel within a few miles, since the plan didn't include my navigating the open halves of the tank to Easter Island when I got back to the surface, but that would do me no immediate good. The storm would probably still be going on, and they wouldn't be able to see me at fifty yards. If they did, they probably couldn't do anything about it unless there were more specialized salvage gear aboard than seemed likely. Even a minor ocean storm is quite a disturbance, and one doesn't pick a pressure tank bobbing around on its waves casually out of the water.--



There was an encouraging side to that thought, though. If I did get to the surface, it would also be hard for any sub to get hold of the tank. My broadcaster would then be working, and maybe - just maybe - if it even brought a Board ship into the general neighborhood the pursuers would keep out of sight. On the other hand, it was at least equally likely that they would consider it worth every effort to get hold of me, witnesses or no witnesses, in view of what I had obviously seen down below. But the other hope was worth holding onto for its comfort value. Since I'm a civilized human being, I never thought until later of the possibility that if they couldn't capture me they might just punch a hole in the tank and let me sink.

Maybe I'd make it. The minutes were passing. It was taking each one a year to do it, but they were passing. Each brought me nearly two hundred feet closer to those storm waves, if they were still there. I hadn't bothered to check the forecast beyond the time I was scheduled to submerge, and I'd been down quite a few hours. I'm not immune to seasickness by any means, but I rather hoped there would still be enough wave action to give me a good dose of it this time. Maybe it would even make my friend just outside lose his grip on whatever he was holding onto. That was something else to hope for.

But first I'd have to get up to those waves, and there was still half a mile to go. The tapping went on. If I'd been anywhere else on Earth I might have preferred the Chinese water drops by then, but this was no place to be asking for water drops. I tried to shut out the sound and keep my attention on other things, like the pressure gauge - was there a little wiggle in its needle which might be due to the wave action far above - or the question of food. If the waves were there, maybe I'd better put off eating. I kept moving from one port to another in a hectic but rather useless effort to spot the sub which must be approaching; but it was my passenger who saw it first.

Chapter Six

I knew what had happened when the regular tapping suddenly changed once more to the complex code, but it took me another half minute to spot the approaching light. I didn't have a very wide angle of view from any one of the ports.

All I could see at first was the light, a solitary spark on a space-dark background, but there could be no doubt what it was. It was just a little below us, well to one side. Its bearing changed as it grew brighter. Apparently it was approaching on a spiral course, holding the sound of the tapping at a constant angle off its bow to let the pilot keep a constant idea of his distance from the source.

Even when it was close I had trouble making it out, for its main spotlight was turned straight on the tank and there was too little diffused radiance to show anything close to it. This apparently bothered my passenger, too, for there was another burst of code tapping as the sub halted thirty yards away, and the light went out. In its place a dozen smaller beams illuminated the whole area, none of them shining directly our way; so I could see the newcomer fairly well.

It was not exactly like any sub I'd seen before, but was similar enough to some of them to give my eyes a handle. It was small, either one or two men, not built for speed, and well equipped with manipulation gear on the outside — regular arm and hand extensions, grapples, bits, probes, and what looked like a water-jet digger. One of my hopes died quickly; there had been a chance that a small sub would not have enough negative buoyancy to drag the tank back down, but this fellow had big, fat lift chambers and must have ballast to match. It was evidently a tug, among other things. If it could get hold of me, it could pull me down, all right; and it was hard to see how it could be kept from getting that hold. All I had to fend it off were the legs.

I wasn't sure how effective these could be, but I kept my fingers at the panel resolved not to miss anything that looked like a good chance. At least, now that some sort of action was in the offing, I wasn't dithering as I had been during the minutes before the sub came in sight.

The pilot's first method was to drift above me and settle down. He must have had a strong streak of showoff in him, since it was hard to imagine a less efficient means of sinking a round object. I thought he'd have his troubles, but my passenger didn't seem upset, and I have to admit the character knew his boat handling. The swimmer waved him into position, putting me under the sub's center of buoyancy, and he made contact. My pressure gauge promptly showed that the upward motion had been reversed. I waited a few seconds in the hope that my hitchhiker would go inside the sub, but he made no motion to, and I finally had to let him see my technique. This was simple enough - simpler than rolling along the sea bottom, since the surface above me was much smoother. Also, I didn't have to go so far to accomplish something; a very small shift away from his center of gravity gave my tank's lift a torque that was too much either for his reaction time or his control jets. Since he had enough weight in his



tanks to overcome my own lift, he flipped over, and I was on my way up again.

Unfortunately, as I promptly learned, Lester the Limpet was still with me. His tapping started up within seconds of the time I got out from under. His friend evidently took a while to get his machine back into trim — I could understand that; tumbling, with a couple of tons of surplus negative buoyancy thrown in, is a problem for any sub — but he was back all too soon. He was no longer in a mood to show off; he bored straight in, with a grapple extended.

I turned on my outside lights, partly to make things harder for him and partly so that I could see better myself. This was going to be tricky for both of us; he had to find something the mechanical hand could grip, and I had to shift my own body weight so as to turn the tank enough to bring a leg into line for what I had in mind. It was just as well I'd gotten my recent practice on the bottom. At least I knew to a hair where each leg went out, relative to the positions of the ports.

I took him by surprise the first time. He hadn't considered all the possibilities of those legs - maybe he didn't even know how many I could use, though they were visible enough from the outside. He matched my upward drift very nicely, though I was able to hamper him a little bit by shifting my weight and changing the frontal presentation of the slightly irregular tank. With relative vertical motion practically zero, he came in slowly with the mechanical hand reaching for some projection or other — I couldn't tell what he had in mind. I rolled just a little to get a leg in line with the grapple, and when the latter was about two feet from contact I snapped the leg out.

The spring was strong. Remember, it was built to prop the tank in position on a slope even when the ballast was still attached. The engineers who built it could tell you how many pounds of shove it gave. I can't, but I could feel it. The sub and tank were pushed neatly away from each other. The line of thrust was not exactly through the center of my shell, and I got quite a bit of spin out of it. The sub didn't.

Either the push was better centered on him or he was quicker this time with his control jets.

He was a stubborn character. He came back and tried the same thing again, after my spin had stopped. I was able to repeat, with about the same results. Konrad the Chiton was still with me, though, and he had my technique figured out by this time. He moved a little away from me to free his hands for signaling, waved them for about ten seconds in a complicated pattern that meant nothing to me, and then came back and took hold of the tank once more.

The sub made another approach, similar to the preceding two, and I tried to line up for another kick. My friend, however, had different ideas. He was much farther from the center than I was, and could exert much more torque. He could also see where the legs were, and when I shifted my weight to line up the proper one with the approaching grapple he interfered. He was too smart to fight me directly, though he probably could have managed it; instead, he let me get moving and then supplied an extra shove to one side so that I either overshot or missed the right position. I made three attempts to line up as the hand was coming in and finally gave the kick a little out of line when the sub was about to make contact. The leg grazed the side of the handler and put a little spin on the tank, but didn't hit anything solid enough to push us apart. Worse, it gave the sub operator a chance to grab the leg itself. This he seemed to feel was a better hold than whatever he had planned on; he clamped on tightly and began to cut buoyancy once more.

This proved to be a mistake, though it didn't help me as much as it might have. The leg wasn't strong enough to hold the tank down. It parted, and once more the sub disappeared below me. I cut my lights promptly, hoping that my passenger had lost his hold with the jerk. Maybe he did, but if so he wasn't far enough away to lose track of me. In a few seconds the tapping resumed, and in a few more the lights of the sub were close enough to make my blackout an idle gesture. I turned mine back on again so that I could see to resume the sparring match.

Now he got the idea of making his approach toward the spot where the leg had been lost, so that I'd have to turn further to bring another into line. My swimming friend was co-operating nobly, and for a little while I was afraid they had me. The sub operator was too smart to try for a leg again, but he managed to keep out of the way of several kicks I gave out. He got in, made what should have been a successful grab at something on my outer surface, but was hurried and missed. He had to back up for another try . . . and I had time to get another idea into operation.

I knew where the swimmer was. I could see enough of him to tell not only that but to guess which way he'd be pushing next time. I began to put a spin on the tank with him at one pole so that he wouldn't notice it quite so quickly. This worked, though I didn't get a really rapid rotation — I couldn't, of course, with such poor torque; but with the tank's weight I had enough for what I wanted. One of my strong points in basic physics, ages ago in school, was mechanics. I couldn't handle the present problem quantitatively because I didn't know either my angular speed or the tank's moment of inertia, but I hit the qualitative answer on the button. As the grapple approached again I shifted my weight to start the tank processing. Billy Barnacle tried his usual stunt of pushing me sideways and sent the leg right through the point I wanted. Either he'd forgotten what they'd taught him about gyroscopes or he was



getting tired. I hit the grapple dead center with my kick, and we were apart again. If I'd been driving that sub, I'd have been getting tired of the whole business by now.

Apparently he was more patient than I. He was back again all too soon.

I had gained maybe three or four hundred feet with each pass of our duel. I had an uneasy feeling that I was going to run out of tricks before those increments added up to the total distance to the surface.

Certainly if he had the patience to keep repeating the same technique, he'd soon run me dry.

He didn't, though. He seemed to have decided that the grapple wasn't quite the right tool after all. When he came back next time he did his usual speed-matching some distance above me, instead of level. A small light flickered, apparently in code, and my pressure-proof friend let go of the tank and swam up to the sub. He was back in a moment, trailing a line behind him.

Apparently it had been decided that human hands were more versatile than mechanical ones.

At first I wasn't worried. There was nothing on the outside of the tank except the legs which would really lend itself to the attachment of a rope, and it had already been demonstrated that the legs weren't strong enough. Hours before, on the bottom - no, come to think of it, it was much less than one hour - my pal had felt the need of a cargo net to wrap around the sphere. If he didn't have such a net here, all should be well.

He did, unfortunately. It was bigger and heavier than the one they had had on the bottom, which was probably why he wasn't swimming with it. When he got back just above the tank he began hauling on his line, and the net emerged from one of the sub's service ports. He pulled it to him and began to spread it out so that my tank would float up into it. He failed the first time through no doing of mine; he simply didn't get his net deployed in time. I ran into it while it was still only partly open. It had more of its weight on one side of me than on the other, so I automatically rolled out from under it and kept on rising. I didn't have to move a finger. The sub was also rising, of course, so the net trailed downward to the end of its line and folded itself together. The boy in the sub had to reel in mechanically while the swimmer held onto me, before they could go through it all again.

That was another few hundred feet gained.

The next time they spread the net much farther above me. Once open it was even less maneuverable than the tank, and by a little judicious rolling to make the outer irregularities affect my direction of ascent I managed to get far enough from its center to roll out the same way as before. What that team needed was two more swimmers, I decided.

It turned out that one more was enough. They reeled in the net again, lifted the sub a distance, adjusted its buoyancy so that it rose a little more slowly than I did, and then the operator came out to join the swimmer. Each took a corner of the net and with the boat for the third corner formed a wide triangle which they were able to keep centered over me. I tried to work toward the sub, which seemed to be unoccupied and wouldn't back up to keep the net spread. It didn't work. The men moved just a little in the same direction, letting the net sag toward me.

The next thing I knew it was draped around me, and I couldn't tell which way to roll even if I had been able to start rolling. The swimmers came in from their corners and began tying it together at the bottom.

If they finished, I was done. I watched them as well as I could, trying to spot where there was an edge — anything to tell me that there was more weight of net on one side of me than the other. I spotted what I thought was a chance to interrupt the work while I got a better look, and I'm afraid I took it.

One of the men was next to the tank and a little below it, pulling a section of net closer. Maybe it was the sub operator — the light was good, but I didn't take time to check — and he wasn't as familiar with the leg arrangement as his companion. Anyway, he was in the way of one of them, and I let him have it.

My intention, if I had one — I really didn't take time to think — was to knock him out of the way so I'd have a chance to roll out of the net. I certainly didn't mean to do him serious or permanent damage. The disk at the end of the leg, though, caught him on the right side and could hardly have helped breaking some ribs. It kicked him away like a shark butted by a dolphin. The line he was holding practically flew out of his right hand, and a tool whose nature I couldn't make out fell from his left. He began to sink out of sight.

The other swimmer was onto him before he'd left the reach of the lights. He was evidently out cold; his body was completely limp as his friend towed him up toward the sub. I didn't watch too closely, partly because I was trying to roll myself out of the net and partly because I regretted what I'd done.

I made little progress with the rolling. They'd gotten some knots into the system already, and it looked as though I were there to stay. I managed to make a half turn, getting what had been the tank's bottom when I was caught swung up to the top, but it didn't do me a bit of good. The meshes wound around the tank even more tightly during the turn.

I was a little above the sub by that time - as I said, they'd trimmed it to rise a little more slowly than the



tank - and the tension on the line connecting the net with the boat was swinging me directly over the latter. It was also tipping the sub, I noticed, since the line wasn't attached anywhere near the latter's center of gravity. I watched, helpless but hopeful, to see whether the single rope was strong enough to drag me down when they really put weight on the boat.

I didn't find out. The uninjured man towed his companion to the little vessel, opened its main hatch, and after some trouble got him inside. Up to that point we'd still been raising. Now it appeared that the sub was putting on more weight, for the line tightened and my pressure gauge reversed its direction once more. However, the sub, which had leveled off after the men got on board, now went down badly by the stern. Evidently the off-center lift through the net line was more than could be countered by shunting ballast, at least if enough total weight was in the tanks to maintain a descent. Apparently there was a higher priority attached to bringing me back than to keeping the boat level. I watched, with my fingers crossed, hoping the line would give.

It didn't, but someone's patience did. Maybe the swimmer I had hit was seriously injured, though I hoped not; but whatever the cause, whoever was now running the sub decided that speed was of prime importance.

He suddenly cast off rope, net, and all, and disappeared in a few seconds. I was alone at last, bound once more for the surface. It was almost an anticlimax.

It was also quite a letdown. The dogfight, if you could call it that, had lasted only ten or fifteen minutes in all and certainly hadn't involved me in much physical labor, but I felt as though I'd just done ten rounds with someone a couple of classes above my weight.

Now I was safe. There wasn't a prayer of their finding me again without sonar, with no one hanging outside to broadcast sound waves from my own hull, and with my lights out — I hastily turned them out as that thought crossed my mind. I had less than two thousand feet to go — not much over ten minutes, unless the drag of the net and line made too much difference. I watched the gauges for a while and decided that they didn't, and for the first time since I'd left the surface I fell asleep.

Chapter Seven

I was awakened by being tossed around; the storm was still on. More specifically, I was awakened by being cracked on the head by a corner of the control panel.

It wasn't hard enough to damage either the panel or my skull, but it was uncomfortable. So was the whole situation. Riding up and down on fifteen-foot waves is bad enough in a stable boat, but in a nearly spherical container which has practically no preference for a definite up and down it is infinitely worse. I've been in free fall in space, which is no joke, but I'll take it again any time before being a human volleyball in the middle of even a modest-sized Pacific storm. That was one thing they hadn't bothered too much about when they designed the submarine escape shells. The idea was to get to the surface rather than to be comfortable afterward. All I could do was turn on the rescue broadcaster and try to keep my stomach in place.

I couldn't even be sure anyone was receiving it—the broadcast, I mean. It was a good bet that they were, since my return was certainly expected. But several good bets had failed to pay off already. I couldn't even sleep. Fortunately I'd had enough sense not to eat when the idea had occurred a while back, so I couldn't do what my stomach wanted most to do just then. I couldn't do *anything*. The whole situation was as bad physically as the original descent had been mentally, But there's no point trying to make it any clearer; I might succeed.

I did wish I'd taken the trouble to find out how long the storm was due to last. Then I might have gotten some comfort from an occasional glance at the clock. As things were, I quickly found that it was better not to look at it; the time since the last look was always so much less than I'd guessed. As it turned out, I should have watched some of the other instruments, though their reading would have been no comfort either - and there would have been nothing to do about them.

I would never have believed that the end of that motion could have been anything but a relief. If anyone had told me that it would make me feel worse, I'd have used violence on him for fear he might convince me. Unfortunately, he'd have been perfectly right. The end came much too suddenly.

The first motion to stop was the rolling. The tank still bobbed up and down, but seemed to have acquired a definite top and bottom. Then the vertical oscillation also decreased, and finally stopped. By that time there was nothing more the pressure gauge could tell me, but I looked at it anyway.

I was right. The tank was going down again.

There was one thing I didn't have to worry about; it wasn't a case of ordinary sinking. The only hollow



space which gave the tank its buoyancy was the one I was in, and if that had been leaking I'd have known it already. No, I was being pulled down; and granting that there are such things as giant squids, I didn't for an instant think that one of them was responsible. The sonar monitor was dark now, but maybe it hadn't been for the last hour or so - I wouldn't have known.

There was only one reasonable explanation. I looked down, not knowing what I really hoped to see and didn't see very much; the sub wasn't bothering with lights. I turned on my own, but could see only the single line, taut now, leading from the net which was now thoroughly tangled around me to a vague bulk just on the edge of visibility.

The line, it may be remarked, was quite strong enough for what it had to do; we were descending much faster than my original ballast had carried me down. If the owners of that rope were prepared to trust it under such stress, I saw no point in doubting their judgment. I didn't even bother to hope it would break. I calculated that I'd be on the bottom in twenty minutes or so, and let it go at that.

At least, I could eat now. I began to absorb a dextrose pill with such calmness as I could collect. There was nothing else to do; they had me.

We were still several hundred feet from the bottom when company showed up. Two more subs, brightly lighted, hove into view. They were work machines similar to the one I'd had trouble with a few hours before. If they were in communication with the one which had me in tow, it was by means of something none of my instruments could pick up. They probably were, since their maneuvers were perfectly coordinated. First one and then the other newcomer swung close beside me, and each used its 'hands' to hang several hooked slugs of metal into my net. These weights took nearly all the stress off the tow rope and removed any hope there might have been of its breaking at the last moment.

Then a swimmer slipped out of each boat and took station beside me, saving themselves work by holding onto the net too. I flicked my lights on for a moment, but couldn't recognize either face. I began to wonder about the fellow I'd hit and what his friends might think about it if I'd hurt him really seriously. The human mind sometimes goes off on funny sidetracks; I never once, while I was being towed, thought about their reaction to my having discovered their obviously secret installation. If I had, I'd probably have told myself that if they really wanted to do anything final any of their subs could have cracked the tank with no trouble at all.

Eventually the bottom came into view in the range of my own lights.

It wasn't luminous this time. I thought at first that they must have turned their lights off; then I realized that the storm must have carried me some distance, and there was no reason to expect to be very near the tent. This was ordinary sea bottom complete with crab burrows; I could tell, because after reaching it the sub reeled in most of the tow line and left me only about twenty feet up. This gave me a good look at the boat itself, too, and I could see that it wasn't my former antagonist. For one thing, it was about twice as big.

It wasn't very different in general design, though. There was still plenty of equipment on the outside - more, if anything. It was meant for work, not travel. Even without the drag of my tank it wouldn't have made very good speed over the bottom, but I could see that we were moving. I had no doubt we were heading either for the entrance I'd seen earlier or for some other one and kept looking ahead for its lights.

As it turned out, we reached a different one. We were a couple of hours getting there, though that's an academic point since I didn't know where we'd started from anyway. This pit was smaller than the other, and the lighted tent roof was nowhere in sight when we reached it.

This entrance was only about twenty-five feet across, much too small for the sub that was towing me and borderline for the other two. It was perfectly cylindrical, with vertical sides, and opened from the bottom of a shallow bowl just as the other had. It was very well lighted, so I had no trouble making out details.

There were many ladders around the rim. At first they led down out of sight, but as I came closer I found I could see the bottom ends of those on the farther side of the opening. The pit was apparently a hole in the roof of a chamber something like forty feet deep.

There were several more swimmers in and above the hole who seemed to be waiting for us. As we approached, they paddled out rather casually and gathered around the tank as the sub that was towing me settled to the bottom just beside the entrance.

My tank drifted upward and slightly forward until the tow rope was vertical. One of the swimmers waved a signal, and an escort sub swung back in and hung another slug of ballast onto my net. That took the rest of the tension off the rope, and I began to sink.

The swimmer signaled again, and the tow line came free of the big sub. Several men grabbed it; the rest took hold of the net, and they all began to work me toward the pit as I settled. This seemed to be the last lap. Unless they had the stupidity to leave me right under their hole in the roof, which would be too much to expect even in twentieth-century realistic literature, the most remote chance of my getting



back without their consent and assistance would vanish once I was inside that entryway. I was nearly frantic. Don't ask me why I felt so scared at one time and so calm and steady at another; I can't tell you. It's just the way I am, and if you don't like it you don't have to live with it, at least. I don't know what I did or thought in those few minutes, and I'd probably not want to tell anyone if I did remember. The fact was that there was nothing whatever I could do. I had all the power of a goldfish in his bowl, and that sometimes upsets a man — who, after all, is used to having at least a little control over his environment.

I was a little more calm as I reached the edge of the pit; I don't know the reason for that, either, but at least I can report the incident. There was a pause as we reached the tops of the ladders, and the subs and swimmers both clustered around and began hanging more ballast onto my net, adding insult to injury. The swimmers also picked up what looked like tool belts from hooks near the ladder tops and buckled them around their waists, though I couldn't see why they should have more need of these inside than out. At least, I couldn't see any reason at first; then it occurred to me that tools might be useful in opening up my tank. I decided not to think of that just yet.

From inside, the pit looked even more like a hole in a ceiling. The chamber below was much larger than I had realized, fully a hundred feet on each side. The entrance was simply a black circle above me, and as I watched it ceased to be above me. The swimmers were pushing me toward one of the walls. I thought for a moment that rolling across the ceiling would at least be easier than the same action on the sea bottom, but dismissed the point as irrelevant and academic. My morale was rising, but was still pretty low.

At least, I was still alive, and in a way I'd done some of my job. I'd dropped the transponder near one entrance, and there seemed a decent chance that it hadn't been found. My pick-me-up broadcast had been going for several hours at the surface, and the chance that it had been received was excellent. The Board would know I'd done *something*, and would certainly be moved to check up on what had become of me. If they swept the bottom with high-resolution sonar they could hardly miss the smooth surface of the tent, even if the transponders didn't work. In fact, considering how big the tent seemed to be, it was rather surprising that ordinary depth-meter records hadn't picked it up some time or other.

I should have given more thought to that point, though it would have sent my morale downhill again.

As it was, I could believe that this installation would be found fairly soon, even if I myself wasn't.

The big room had little detail to mention. I assumed at first that it would turn out to be a pressure lock or the vestibule to one, but the big tunnel opening from it had no door. There were smaller panels on the walls which might have been locks — some of them were big enough to admit a human figure.

The swimmers towed me toward the tunnel mouth and into it. It was fully twenty feet in diameter, much more than large enough for the tank, and was lighted almost as well as the chamber we had just left. I found myself getting angry again at this bunch who were being so free with their energy. I was also beginning to wonder where they got so much of it. I'd run into power-bootleggers before in the course of business, naturally, but never an outfit with so much of it to throw around.

We went only a few yards — twenty or so — down the tunnel before coming to another large room which opened from it. They towed me into this. It had several much smaller tunnels — maybe I should say shafts — opening from its floor; I counted eight in my first glance. None of these openings had lids or doors either. Apparently a large part of the installation was flooded and under outside pressure.

Maybe it was a mine; that would account for the energy, if the product were uranium or thorium, and it would not be practical to try to keep all the windings and tunnels of a submarine mine free of water.

I had just about time to run that thought through my mind while the swimmers were putting me and my tank down on the floor. It started to roll a little, and I put out three legs to prop it. Luckily all three got through the meshes of the net which was still around me without being jammed.

With that settled, I looked at the bunch of people around me to see what they'd do next. It was clearly up to them.

I'm used to it now, but I still don't like the memory of what they did and what it did to me.

They took off their helmets. A mile under the sea, in pressure that would crush sponges, metal into foil, they took off their helmets.



Chapter Eight

It must be obvious from the things I've already said that I'm no psychologist, though I've read a little about the field. I've been told that it's possible for a person to deny flatly and categorically the evidence of his own senses, if their reports disagree violently enough with what he thinks he knows. In fact I've met people who claim that the ability to do this is all that keeps most of us sane. Until that moment, I'd doubted both statements. Now I'm not so sure.

I'd seen us come in from definite, obvious sea-bottom conditions to the place where we now were. I had not seen anything even remotely like a door, valve, or lock either open before us or close behind us, and I had certainly been looking for one. To the best of my knowledge and belief, therefore, my tank was now in a room full of sea water at a pressure corresponding roughly to a mile's depth.

I had seen the people now in the chamber around me swimming in the sea outside - the same people, for the most part. I had seen them, continually or nearly so, as they brought me in. They, too, were still in high-pressure water and had been all along. I was forgetting for the moment the clarity with which I had been able to see those some faces in the water outside, but even if I'd remembered I probably wouldn't have seen the relevance just then.

I had seen them remove the helmets, just now, still apparently in high-pressure water. No, I couldn't believe all of that at once. It was missing something, but I couldn't believe it was recently an observable fact. I'd been battered around during the storm and had certainly missed the technique which had been used in finding me, but I hadn't been unconscious, then or later. I was short on sleep, but surely not so dazed by it as to have missed any major happenings. I had to believe that my observations were reasonably complete. Since I was, in spite of that belief, clearly out of phase with reality, there was something I just plain didn't know. It was time for more education.

I wasn't too worried about my personal future; if there had been any intent to dispose of me, it could have been done earlier with much less trouble - and as I've said before, I couldn't believe, deep down, that people would do anything final to me anyway. If you think that doesn't jibe with the way I've admitted I felt a few minutes before, *you* ask a psychiatrist.

I had a couple of days of breathing still in the tank, and presumably before that time was up my new acquaintances would do something about getting me out - though I couldn't offhand see what it would be, now that I thought of the problem. Any way I, looked at it, though, the next move seemed up to them. Maybe that shouldn't have been comforting, but it was.

Apparently they felt the same way - not comforted, I mean, but that they should be doing something.

They were gathered in a group between the tank and the door we had come through, apparently arguing some point. I couldn't hear their voices, and after a minute or two I decided they weren't actually talking; there was a tremendous amount of gesticulation. They must have a pretty comprehensive sign language, I decided. This was reasonable if they spent much of their time, and especially if they did much of their work, under water. I couldn't see why they used it now, since my common sense was having trouble admitting that they were still in water.

In any case, they seemed to reach an agreement after a few minutes, and two of them went swimming - yes, swimming- off down one of the smaller shafts.

It occurred to me that even if they couldn't talk under the circumstances, they should be able to hear. So I tried tapping on the walls of the tank to get their attention - gently, in view of my experience with tank-tapping so shortly before. Evidently they could hear, though they had the expected difficulty in judging the direction of the sound source and it took them a few minutes to recognize that I was responsible. Then they swam over and gathered around the tank, looking in through the ports. I turned on my inside lights again. None of them seemed surprised at what they saw, though a continuous and animated gesture conversation was kept up.

I tried yelling. It was hard on my own ears, since most of the sound echoed from the walls of the tank, but at least a little should get through. It evidently did; several of them shook their heads at me, presumably indicating that they couldn't understand me. Since I hadn't used any words yet, this wasn't surprising. I tried telling them who I was — not using my name, of course — in each of the three languages in which I'm supposed to be proficient. I attempted to do the same in a couple of others in which I make no claim of skill. All I got was the headshaking, and two or three people swam away, presumably dismissing me as a hopeless case. No one made any obvious attempt to communicate with me by any sort of sign or sound.

Eventually I felt my throat getting sore, so I stopped. For another ten minutes or so nothing much happened. Some more of the crowd swam away, but others arrived. There was more of the gesture talk; no doubt the newcomers were being given whatever there was to tell about me.

All the new arrivals wore coveralls more or less like those I'd first seen outside, but some of these were



in fancy colors. I got the impression that it was the difference between work clothes and white-collar suits, though I can't give any objective reason for the notion.

Then some new swimmers, less completely dressed, appeared from one of the tunnels, and things began to happen. One of them worked his way through what was by now quite a crowd, came up to the tank, and tapped it gently. It was refreshing to have one of them try to get my attention instead of the other way around, but the real jolt came when I recognized the newcomer.

It was Bert Whelstrahl, who had disappeared a year before.

Chapter Nine

He recognized me, too; there was no doubt about that. He put on a larger-than-life-size grin the moment he got a good look through my port, gave another bit of knuckle play on the tank and then drew back and raised one eyebrow in an oh-no-what-do-we-do-with-this-one expression. I decided the situation justified using up what was left of my voice and called out, 'Bert! Can you hear me?' He nodded, and made a palm-down gesture which I interpreted as meaning that I didn't need to yell so loud. That was a relief. I cut volume and after a bit of trial and error found that he could hear me when I spoke only a little louder than a normal conversational tone. I began to ask questions, but he held up a hand to stop me and began making some more signs. He pinched his nose shut, holding the palm of his hand over his mouth at the same time; then he held his left wrist in front of his face as though he were looking at a watch, though he wasn't wearing one.

I got his meaning clearly enough. He wanted to know how much breathing time I had left. I checked my panel, did a little mental arithmetic and called out that there was about fifty hours still in my tanks. Then he stuck a finger in his mouth and raised his eyebrows; I answered graphically, which was easier on my throat, by holding up the partly emptied box of dextrose pills. He nodded and put on a thoughtful expression. Then he hand-talked for two or three minutes to the people nearest him, the head motions which they threw in occasionally being the only part I could understand. With everyone seemingly agreed, he waved at me and vanished back into the tunnel he'd come from.

Nothing more happened for the next half hour, except that the crowd grew even larger. Some of the newcomers were women, though I couldn't tell whether the one I had seen outside was among them. I hadn't seen her closely enough to recognize her face. Some of them certainly weren't; apparently swimming doesn't have to be the aid to figure control some people claim it to be.

Then Bert came back. He was carrying what looked like an ordinary clipboard, but when he held it up to the port I saw that the sheets on it weren't paper. He scratched on the top one with a stylus, which left a mark. Then he lifted the top sheet, and the mark disappeared. I'd seen toys of that sort years ago; apparently he'd spent some time improvising this one. It seemed a good and obvious solution to the problem of writing under water, and I wondered why none of the others had thought of it.

He had to print fairly large letters in order for me to read clearly, so even with the aid of the pad our communication was slow. I started by asking what the whole business was about, which didn't help speed, either. Bert cut me off on that one.

'There isn't time to give you the whole story now,' he wrote. 'You have a decision to make before you run out of air - at least twenty hours before, in fact. It has to do with whether you go back to the surface.'

I was surprised and made no secret of it. 'You mean they'd let me go back? Why did they go to all that trouble to get me down here? I was already at the surface.'

'Because your decision and its details will affect a lot of people, and you should know who and how. They didn't know you were a Board official until I told them, but it was obvious your story when you got back would get to the Board anyway. It's rather important just what the Board hears about this place.'

'I suppose it's a case of being released if I promise to tell nothing. You know I couldn't do that.'

'Of course not. I couldn't either. That's not what they expect. They realize you couldn't go back without telling; there would be no rational explanation of where you'd been or why. You can tell everything that's happened to you and that you've seen, but there are other things they want to be sure you include. We must make sure you know them.'

I jumped on the pronoun.

'You switched from "they" to "we". Does that mean you've chosen to stay down here yourself?'

'Yes.' This was a nod, not a written word. 'For a while, anyway,' he added with the stylus.

'Then you've managed to stomach the morals of a bunch of people who waste thousands of kilowatts



just lighting up the sea bottom? Have you forgotten your upbringing, and why - '
He interrupted me with a violent shake of his head and began to write.

'It's not like that. I know it looks terrible, but it's no more wasting power than the Board is wasting the sunlight that falls on the Sahara. Maybe there'll be time to explain more before you decide, but you're enough of a physicist to see that analogy or you wouldn't be a Board worker in the first place.'

I spent some time digesting that one. The Sahara point was understandable. The Board has always resented having to let all that solar energy go unused. Their stock difficulty, of course, is deciding when it's worthwhile to put energy into a project in the hope of getting more back. It's been the standard belief for decades that man's only real hope lies in hydrogen fusion, and most of the authorized speculative expenditure is for research in this direction. From time to time, though, a very eloquent plea for a solar-energy project comes in. Sometimes an especially promising one gets approved, and one or two of these have even paid off since I've been working for the outfit.

I couldn't see, though, how natural sunlight shining on a desert could compare with artificial light shining on the sea bottom. I said so.

He shrugged, and began to write.

'The energy here comes from below the crust - straight heat, though I can't properly call it volcanic heat. If they don't keep their working fluid circulating down to the collector and get the heat out of it when it comes back up, the hot end of the unit will melt. Your real complaint, if you must have one, is that they don't tie into the planetary power net and observe the rationing rules like everyone else. The reasons they don't are very good, but there isn't time to give them now - they call for a lot of history and technology which would take forever by this scribble-board. What I'm supposed to tell you is what you have to know if you go back up.'

'I take it that Joey and Marie decided to stay down here.'

'Joey hasn't been here. Marie doesn't believe me when I tell her that and is still arguing. No decision has been made in her case.'

'But if Marie is still here with her future unsettled, why did you say I have to make up my mind in thirty hours or so? She's been down here for weeks. Obviously you have facilities to take care of us.'
'We don't "have" them. They were made especially for her, as far as food and air are concerned. She's still living in her sub. It would take more work to get supplies into your tank, which doesn't have locks or air-charging valves. Besides, you're not in quite as good a position as Marie to have people go out of their way for your convenience.'

'Why not?'

'You're neither female nor good-looking.' I had no answer to that.

'All right,' was all I could say. 'Tell me the official word, then. What am I supposed to know if I go back?'

'You're to make sure your boss on the Board knows that we *do* have a large energy supply down here -'

'That I'd tell him anyway.'

' - and that it isn't being rationed.'

'That's also pretty obvious. Why do you want those points stressed? I can't think of any better way to get this place raided.'

'Believe me, it wouldn't be. If the Board thought this was just another bunch of powerleggers you'd be right, of course; but fifteen thousand people don't make a gang. They make a nation, if you remember the word.'

'Not pleasantly.'

'Well, never mind that phase of history. The point is that the Board has hushed up this thing in the past and can be counted on to do it again if they know what they're doing.'

'Hush it up? You're crazy. They'd do just one thing to an operating power plant, even if it was illegally built. They'd tie it into the network. The idea that they'd let it go on running independently, outside rationing, is dithering.'

'Why do you suppose you never heard of this place before? It's been here eighty years or more.'

'I would suppose because nobody's found it. That's likely enough. The bottom of the Pacific isn't the most thoroughly covered real estate on the planet.'

'It's been found many times. Several in the past year, if you'll stop to remember. Twelve times that I've heard of since this place was built it has been reported to the Board as a finished, operating project.

Nothing further has come of it'

'You mean the Board knows where this thing is and still lets me come looking for you and -'

'They may not know the location. I'm not sure the present Board knows anything; I don't know what was done with the earlier records by their predecessors. The last time was over fifteen years ago.'

'You know all this for fact?'



'Objectively, no. I've read it in what seem credible reports. I'm not qualified as a historical researcher and didn't make professional tests. It all seems very probable to me.'

'It doesn't to me. Have you told all this to Marie?'

'Yes.'

'Does she believe it?'

'She doesn't believe anything I say since I told her that Joey has never been here. She claims I'm a dirty liar and a traitor to mankind and an immoral skunk and that we disposed of Joe because he wouldn't swallow our ridiculous falsehood.'

'Would I be able to talk to her?'

'You'd have my blessing, but I don't see how. She's a long way from here, since her sub arrived at a different entrance. I don't think it would be possible to get your tank there without taking you outside again; it would take longer than you can spare, and I'd have trouble finding enough people to get you carried.'

'Can't whoever runs this place assign a crew?'

'How do you think we're run? There isn't anyone who could order a person to do such a thing, since it's more for your pleasure and convenience than public necessity. Besides, I told you there isn't time.'

I pondered that for a little while. His remark about how the installation was run was a little surprising, but this was hardly the time to go into local politics. He'd started to give me a more interesting impression, anyway; if what he'd said could be credited, it seemed almost as though it would be better for these people if Marie and I left than if we stayed. Why was the choice being offered, then? I asked Bert, a little indirectly.

'What will your friends do if I don't go back up? More people will come to look for me, you know. Even if I hadn't reached the surface and started my rescue set, which I did, the Board knows where I was going and why.'

He shrugged again. 'No one cares how many come down. Unless there's a whole fleet at once, we can pull 'em in and give them the same choice we're giving you. It's happened often enough, as I said.'

'And suppose a whole fleet does come and starts wrecking those lights and that tent or whatever it is without wasting time looking for me or Marie or anyone else? Sooner or later if folks keep disappearing down here that's what will happen.'

'I'm not in on all the thoughts of the Council here,' he answered, 'and I don't know whether they've thought much of that point. I repeat, there have been quite a few people who stayed down here without getting the Board very excited. Personally, I think they'd just put this part of the Pacific off limits to the general public long before they'd waste energy sending a fleet of subs down here. In any case, that's the Council's worry. The current point is that you and Marie do have the choice and will have to make it of your own free will.'

'What if I refuse to commit myself?'

'Once you've been told what is necessary, we'll simply turn you loose at the gate you came in by. You're hardly in a position to hang on and refuse to go up. No problem.' He gestured toward the direction from which we had come along the tunnel. 'Speaking for myself, I'd like to have you stay — and Marie, of course. I do have some good friends down here now, but they're not quite the same as old ones.'

I thought for a few seconds more and then tried to catch his eye through the port while I asked the next question.

'Bert, why did you decide to stay down here?'

He simply shook his head.

'You mean it's too long to explain now, or you don't want to tell me, or something else?' I persisted.

He held up one finger, then three, but still wrote nothing.

'In other words, I'm going to have to make up my own mind entirely on my own.' He nodded emphatically. 'And Marie, too?' He nodded again.

I could think of only one more question likely to be helpful, and I threw it at him.

'Bert, *could* you go back up above now if you changed your mind about staying? Or is what they did to let you breathe water impossible to reverse?'

He smiled and used the stylus again.

'We're not breathing water; that analysis misses on two counts. They did make an irreversible change, but it's not a very serious one. I could still live at the surface, though the shift back to air breathing would be somewhat lengthy and complicated.'

'You just said you weren't breathing water!'

'I repeat it. I'm not.'

'But you just said - ' He held up his hand to stop me and began writing again.

'I'm not trying to tantalize you. The Council isn't dictatorial by nature, or even very firm, but it feels



strongly and unanimously that the details of how we live here shouldn't be discussed with anyone who hasn't committed himself to staying. I may have said more than they'd strictly like already, and I'm not going any further.'

'Do the people out there with you disagree with the Council?'

'No. The feeling on that point is pretty uniform among the populace.'

'Then why did you take the chance of telling me as much as you did?'

'Most of them were in no position to see what I wrote, none of them could have read it, and none of them can understand your spoken words.'

'Then the native language here isn't -'

'It isn't.' He'd cut me off again with a wave of his hand before I even named a language.

'Then why do you worry about disobeying this Council on the matter of telling me things?'

'Because I think they're perfectly right.'

That was a hard one to argue, and I didn't try. After a minute or so, he wrote another message.

'I have work to do and have to go now, but I'll be back every hour or two. If you really need me badly, pound on your tank - not too hard, please. Even if no one is in sight, which isn't likely, you can be heard for a long distance, and someone will send for me. Think it over carefully; I'd like you to stay, but not if you're not sure you want to.' He laid the clipboard down beside the tank, and swam off. Quite a few of the others also disappeared, though they didn't all take the same tunnel. The small number remaining seemed to be those who had arrived most recently and hadn't yet given their eyes a real fill of the tank. They did nothing either interesting or distracting, though, and I was able to buckle down to heavy thinking. There was plenty of it to do, and I'm rather slow at the business sometimes.

There was no problem about the decision, of course. Naturally I would have to go back to report.

Staying here might, as Bert had said, merely pass the buck to another investigator, but sending another one down would be a clear waste of power no matter what trick they dreamed up to get him there. Also, I wasn't nearly as sure as Bert seemed to be that the Board wouldn't waste a few tons of explosive on this place if they found it and had reason to believe it had killed off three of their agents. The problem was not whether to go back, but when; and the 'when' depended on what I could manage to do first.

What I *wanted* to do was make contact with Marie. It would also be nice to find out more about Joey, if information of any sort was to be had. I didn't want to believe that Bert had lied about him, and it was certainly possible that Marie's disbelief stemmed from her reluctance to accept the fact that Joey had disappeared in a genuine accident. On the other hand, she was by no means stupid. I had to allow for the possibility that she might have better reasons for doubting Bert.

Joey, like Marie, had had a one-man sub. He could have found out things these people did *not* want known at the surface. After all, what they seemed to want Marie and me to carry back if we went was information, or propaganda, designed to discourage the Board from checking further.

But wait a minute. That was true only if Bert were right about the Board's preferring to hide the word of what went on down here.

If he were wrong — if my own admittedly prejudiced idea of the reaction were closer to the truth - there'd be no question of suppression, and the Board would be down raiding this place within a day of the time either of us got back. That could hardly be wanted by this 'Council' Bert was talking about.

Maybe there really was something in what he had said.

But there still could be things these people didn't want known, whether they were feeding Bert a line about the Board or not. Joey could be here or could have been killed, though the latter went very much against the grain to believe. Even if Bert had been right about his never arriving — perhaps *especially* if he were — there was Marie to worry about, too. If she were feeling stubborn she'd never leave of her own free will, and they couldn't just turn her loose to float up, the way they could me. She had a sub.

Of course, now that I was here they could cripple her boat, make sure it was low on ballast, and turn us adrift at the same time; maybe I should wait for that. Maybe -

If you're getting confused by the way I tell you this you have an idea of the way I felt. If you remember that my memory has done some editing and organizing since all this actually happened, you may have an even better idea. It got to be more than I felt like taking. I suddenly realized that I hadn't had much sleep for a long, long time. The tank wasn't a comfortable place for that, but there are times when one doesn't bother with trifles. I slept.



Chapter Ten

I got in a good, solid eight hours, according to the clock. When I woke up, it was with the conviction that I couldn't plan anything until I had figured out how these people managed to live as they did, what would have to be done to me if I agreed to stay and most particularly what I would have to arrange to do myself if, after agreeing to stay and being processed, I chose to leave.

Bert had made it clear that he wasn't going to tell me, but he had admitted saying a little more than he should have, so there might be a chance of my figuring it out for myself.

My memory is supposed to be good. Just what had he said that might mean anything?

The most striking remark was his denial that he was breathing water. Also, there had been something else in that sentence — what was it? — 'that analysis misses on two counts.' What could that mean?

Grammatically speaking, the most obvious implication of the first phrase was that the liquid now around us wasn't water. Was this possible? And if it were, was there any other evidence?

Yes, to both.

Many liquids don't mix well with water - nonpolar liquids in general. Carbon tetrachloride and all the oils, to name familiar ones. However, if this were such a liquid it must be at least as dense as water and probably denser. Not the general run of oils, therefore. Not carbon tet, either, since it's highly poisonous. The density had to be high because there was no door or valve between this place and the ocean, and oil would have floated to the surface of the Pacific and been spotted long ago.

On that basis, the interface between water and my hypothetical liquid would probably be at the entrance. Memory supported the idea.

As the tank had reached the level of the pit's mouth on the way in, the subs had hooked more ballast to it - obviously necessary if the new liquid were denser than water and the tank were just barely heavy enough to sink in the latter. The swimmers, too, had taken on more ballast - those 'tool kits!' Of course. If they had been tools, why put them on coming in from; the sea bottom? Or if outside were a place for recreation only and tools were only used inside, why not keep them at the place they were used? If there had been room in the tank, I'd have kicked myself for not seeing that sooner -or rather, for not following up the doubts I had had at the time.

All right, first working hypothesis. We're in a nonpolar, nonpoisonous liquid, somewhat denser than water. I think I see why, but let's not be too hasty.

So that was the second point on which my analysis had been wrong. The people, as Bert said, weren't breathing water — because they weren't in water and because they weren't breathing. I still had trouble believing it, but the logic went marching on.

The basic idea was clear enough. If people didn't breathe, they didn't need gas in their lungs. If they didn't have gas in their lungs, they wouldn't be bothered by pressure changes. Well, qualify that. They'd have to fill their middle ears and sinuses with liquid, too. If the liquid had about the same compressibility as water (question: why not use water? Tabled for later consideration) then a change in depth would mean no significant volume change in any part of the body.

A few details needed filling in, though. Granted that it would be convenient to be able to do without breathing, how was it managed?

Well, why does one breathe, anyway? To get oxygen into the blood. Will anything do as a substitute for oxygen? Categorically no. Element number eight is the one and only oxidizing agent the human metabolism is geared to use — and 'geared' is a rather good word in that connection.

But does the oxygen have to come in gas form? Maybe not. If my schooling hasn't gone by the board, hemoglobin is only interested in O-two molecules, not oxide or peroxide ions or ozone; but up to the time the stuff is delivered to the hemoglobin some of the others are at least conceivable. The first thought would be some sort of food or drink. Could something be taken into the stomach which would release oxygen molecules? Certainly. There was hydrogen peroxide. The oxygen released didn't start as diatomic molecules, though it got to that state quickly enough. I couldn't picture anyone in his right mind drinking a slug of peroxide, for several reasons, but the principle seemed defensible so far.

Could the oxygen get from the stomach to the bloodstream? Not directly, but it could take the same path as the other foods. Into the small intestine and through the villi. I seemed to remember that there is a lot less absorbing surface here than in the lungs, but under the pressure of this depth that might not be a serious lack.

Working hypothesis two, therefore, is that these folks eat or drink something that gives off oxygen gradually. If, under this pressure, the gas always remained in solution, the body would still be relatively indifferent to pressure change. Though my outside passenger of a few hours back might have been in serious trouble after all if he'd gone all the way to the surface with me.

How about carbon dioxide elimination? No problem. Out through the lungs, as usual, and into



immediate solution in the surrounding liquid. Maybe that was why the liquid wasn't water; they might be using something that took up CO₂ better, though under this pressure water certainly should be adequate. Of course, with body fluids under the same pressure, it might be more a matter of complex ion equilibrium than simple solubility; perhaps pH control had been necessary. It certainly was *inside* the body, and this whole idea seemed to be lessening the differences between inside and out.

All this suggested that if I chose to stay down here, they would presumably start pressurizing me. Sometime during the process I'd be given a meal, or a drink, of the oxygen source. That, as far as I could see, would be it, barring minor mechanical tricks for filling my sinuses and middle ears with liquid.

How about getting back to breathing habits? The pressure would have to come down again. The oxygen source in the stomach - yes, that would present a difficulty. If it were still giving off the stuff, and pressure got down near one atmosphere - hmph. Very close timing, doing the job just as the stomach oxygen ran out? Mechanical assistance such as an artificial lung between the time the inside source gave out and natural breathing was resumed? Either way, it would be difficult for me to manage alone, if the need ever arose.

In any case, I could now do some tentative planning, always realizing my hypothesis might be all wet. I was fond of them, though, and felt that it would be at most a case of having to modify details as more information came in. It was a pleasant sensation while it lasted.

Under the circumstances, then, it seemed best to tell Bert that I was staying and waste as little time as possible getting out of this bubble so I could do something useful. I'd developed my own moral standards - made my private Loyalty Oath to Mankind, if you like - long ago, so there'd be no conscience question if they wanted me to take some sort of local declaration before they'd accept me. Probably they wouldn't; things like that had been worn too thin to be meaningful back in the days when people thought their chief danger was political difference rather than energy shortage. Lodges and similar private groups still used formal oaths, but even these didn't carry quite the same implications that they used to.

I wondered suddenly why my mind was wandering off in that direction - after all, my plan might be a little deceitful, but it was in a good cause, and my conscience was clear enough - and got back to immediate problems.

Details, of course, would still have to wait. I'd have to learn the local geography, especially the way to Marie's submarine. I'd have to find out just how much freedom of action I was going to be allowed. Bert seemed to come and go at will, but he'd been here for a year. In that connection, probably I'd be expected to earn my living in some fashion; if finding out the details I needed, and working up a plan to get Marie and me back to the surface, all took very long then I'd probably have to do something of the sort. What sort of work would be both useful down here and within my powers was something else for the future to tell.

Right now, then, the thing to do was wait for Bert, or send for him, and give him the word. Waiting would probably be better. There was no point in looking too eager. He'd said he'd be around often, and no doubt had been while I was asleep. He'd be bound to expect me to wake up before long.

I waited, like a monkey in a zoo - or perhaps more like a fish in an aquarium.

Chapter Eleven

It was about half an hour before he showed up. He glanced in through one of the ports, saw that I was conscious and picked up the writing pad.

'Been doing any thinking?' was his opener. I nodded affirmatively.

'Good. Made up your mind?'

'I think so,' I called back. 'I - ' I hesitated. Part of it was for effect, but part of it was genuine uncertainty. I could be wrong in *so* many ways. Then I stiffened up.

'I'm staying.'

He looked a little surprised and started to write. I went on before he had finished. 'At least, I'm staying if you can tell me one thing for certain.'

He cleared his pad and looked at me expectantly.

'Do you genuinely believe — I'm not asking do you *know*, just do you *believe* - that these people are justified in keeping out of the power net and the rationing system?'

Bert's face took on an annoyed expression as he wrote.

'I told you you'd have to make up your mind by yourself. I won't take the responsibility.'



'I expect to make it up myself,' I retorted, 'but not without data. You say there's too little time for you to tell me everything I'd like to know, and I'm arguing that. I'm asking for a conclusion of yours, not even a piece of information you're not supposed to give me, just a conclusion - an opinion - as a summary of information I can't get. Did you make your decision on as little knowledge as I have now?' He shook his head negatively.

'Then I'm sorry if you read my question as a reflection on your morals, but I still want an answer.' He frowned thoughtfully for half a minute or so and looked at me a little doubtfully. I repeated my question, to be sure he understood.

'I really do believe they have the right idea,' he wrote at last. I nodded.

'All right, then I'm staying. How long will it take to get me out of this coconut shell?'

'I don't know.' His writing was slow and interrupted by pauses for thought. 'It's not what you'd call a standard procedure. We're more used to our guests coming in submarines, which have pressure locks or at least some sort of port. I'll tell the Council, and we'll hunt up some engineers who have time to spare, I'm sure it can be done.'

'You mean — you mean it may take a long time? Suppose it takes longer than my air supply?'

'Then I suppose we'll just have to shove you outdoors anyway. If you still want to badly enough, you can always come back in a sub, the way Marie did. I'll go start things moving.'

'But why didn't you mention this before? I thought -well -'

'Some things really shouldn't need mentioning. Where in the world would you expect to find ready-made equipment for taking a man out of a high-pressure escape shell while it was still in a high-pressure environment? Think it over.' He put down the pad and was gone before I could think of a good answer to that one.

In fact he had come back, nearly an hour later, before I could think of one. I still haven't.

Bert, on his return, had better news than I had been afraid he might. The Council, or such of them as he had found - I was getting an idea that it was a body of rather fluid composition, and that the usual way of getting things done officially was to find and deal with one's own chosen quorum of members — had approved my application for citizenship, if it could be called that, with no argument. Several engineers in the group had been interested enough in the problem I represented to go to work on it at once. They were at the task now and might be expected to come up with something shortly.

That was encouraging. I'm an engineer of sorts myself, though I work at it only in its incidental connection with my main job, and every idea I had thought of ran into a blank wall. This was usually a matter of basic procedure. I couldn't see how welding, or high-speed drilling, or any of several other ordinary operations you take for granted in machining and handling work could be done in a liquid environment under a pressure of more than a ton to the square inch. Most tools, for example, have high-speed motors; high-speed motors are a little hard to conceive with their moving parts bathed in an even moderately viscous fluid; and under that sort of pressure, how do you keep the fluid out?

Of course, if these people had been down here the eighty years or so that Bert had mentioned, they should have learned the basic tricks for the environment, just as men had learned space engineering the hard way. I wished I knew how they were going about my problem, though.

I didn't find out in detail, but it didn't take them too long. About eighteen hours - a very boring eighteen hours - after Bert had brought the news, he came back with a team of helpers and began moving the tank. It was quite a trip. We went back outside and traveled half a mile or so to another, larger entrance. Inside it there were several large corridors, instead of just one, opening from the main chamber.

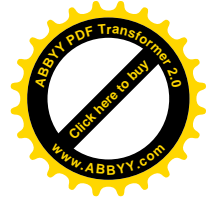
They towed me down one of these for a distance and stopped by a pair of the first genuine locks I had seen since my arrival.

One was quite ordinary, and I barely glanced at it; the other was circular and just about large enough for my tank. It was located in the same wall as the smaller lock, about twenty yards away from it. It was opened as we approached by a couple of the party who swam on ahead, and the tank was juggled through. The wall in which the door was hung turned out to be several feet thick, and the door itself but little thinner; I judged that the room beyond was the one to be depressurized.

The chamber itself was fairly large. One side was crowded with apparatus, the most recognizable items being an operating table with broad restraining straps and a set of remote-control hands much finer than I was used to seeing on work subs.

The larger part of the room, in which the tank had been placed, was almost bare, and it looked very much as though the operating room had originally been much smaller. There were signs that a wall as thick as the one I had come through had been removed from between the spot where I now was and the place where the table and its auxiliary gear stood. I would have liked to see the tools that had done the job.

My guess, as it turned out, was correct; the smaller section had been the original conversion room; the smaller lock leading into it could be connected to the hatch of a visiting sub. The whole trouble had



been that my tank had no hatch; it normally opened by bisection.

Bert wrote instructions for me while the others were getting out of the place.

'When we're all gone and the door is sealed, the room will be pumped down to surface pressure. A green light will flash over the table when it's down, but you'll know anyway - you'll be able to open your tank. When you can get out, go over to the table and get onto it. Fasten the straps around your body and legs. It doesn't matter whether your arms are free or not. When you're tight to the table, press the red signal button you can see from here.' He indicated the button to me. 'It's within reach of your right hand, you see. A container of sleeping medicine will be delivered by one of the hands. Drink it and relax. Nothing more can be done while you're conscious.'

'Why not?'

'You'll have to be plugged into a heart-lung machine during the change. Don't worry. It's been done many times before. Once you're out of that tank and onto the table, the only unusual problem you offer will have been solved. All right?'

'I see. All right.' He put down his pad and swam out through the ponderous lock, which swung slowly shut. I hadn't seen any special dogs or clamps on it, but it opened out into the corridor and wouldn't need any. With its area, once the pressure started down in the room nothing much short of an earthquake could open it.

I could tell when the pumps started; the whole place quivered, and the vibration carried through to the tank very easily. I spent some time estimating the work that would have to be done to empty a room of this volume against a one-mile head of sea water and a little more in wondering how the mysterious fluid that was replacing water would behave when the pressure came down. If it had a high vapor pressure there would be a purging job on top of the pumping one — no, not necessarily, come to think of it; the stuff must be physiologically harmless, so probably the vapor could be left in the room. Of course if it were flammable it might make trouble when they put oxygen in for me to breathe. Well, they were used to that problem and had been for decades. I needn't worry about it.

In spite of all the free energy which seemed to be around, it took nearly half an hour to empty the place. The liquid level went down steadily. The surface, when it appeared, remained smooth. There was no boiling or other special behavior. It might as well have been water. They took no pains to get the last of it out; there were several puddles on the rather uneven floor when the light flashed.

I wasted no time opening the tank; I'd been in it for a long time and couldn't get out too fast. My ears hurt for a moment as the hemispheres fell apart; pressures had not been perfectly matched, but the difference wasn't enough to be serious. Once out I slowed down. My arms and legs were badly cramped, and I found it almost impossible for a few moments to walk even as far as the table. I spent several minutes working the kinks out of my limbs before I took the next step.

The table was comfortable. Anything I could have stretched out on, including the stone floor, would have been comfortable just then. I fastened the broad, webbed strap about my waist and chest, then of course found I couldn't reach down to the ones for my legs. I undid the first set, took care of my legs, refastened the upper strap and finally was ready to push the signal switch. As promised, one of the mechanical hands promptly extended toward me with a beaker of liquid and a flexible tube to let me drink it lying down. I followed orders, and that's all I remember about the process.

Chapter Twelve

I woke up with a reasonably clear head. I was lying on a bunk in a small room that contained two other beds and nothing much else. No one else was around.

Someone had removed my clothes, but they were folded in a sort of hybrid, offspring of a laundry basket and a letter rack near the head of the bunk. Another similar affair held a pair of trunks such as I had seen worn by many of the men around my tank. After a moment's thought I put on the trunks; my other garments weren't made for swimming. I got out of the bunk and stood on the floor, though my head felt a little funny.

It occurred to me that I had no business feeling enough weight to let me stand, under the circumstances; I was presumably immersed in a liquid denser than water, and therefore denser than my body. A thought crossed my mind; I rummaged in the pockets of my old clothes, found a jack-knife, and let go of it.

Sure enough, it fell past my face. I was standing on the ceiling, as were the bunks.

I tried swimming after the knife, which had come to rest a couple of feet out of reach on the



floor/ceiling. It was quite an effort, though not by any means impossible. It was obvious why the people I had seen wore the ballast belts. I didn't see any of those around, though, for the moment at least, I'd have to walk if I wanted to go anywhere. This promised to be rather inconvenient too, since the liquid was fairly viscous, though less so than water. Also, the architecture wasn't designed for walkers; one of the doors to the room was in a wall and fairly accessible, but the other was in the floor - that is, the floor toward which my head was now pointing and on which my jackknife had come to rest. Under the circumstances I decided to wait until Bert or someone showed up with ballast and swim fins. The decision was helped by the fact that I still didn't feel quite myself, even aside from the difference of opinion between my eyes and my semicircular canals as to which way was up and which was down. As a matter of fact, the canals couldn't seem to make up their minds at all on the matter, and it suddenly occurred to me that some surgery must have been done there as well. They could not possibly have been left full of air - or could they? How strong was bone, and how well surrounded by it were the canals, anyway?

I felt around and found several places on my neck and around my ears where the smooth plastic of surgical dressing covered the skin, but that didn't prove much. It had been obvious all along that some work around the ears would be necessary.

I felt no desire to breathe; they must have slipped a supply of their oxygen-food into me sometime during the procedure. I wondered how long it would last.

It suddenly occurred to me that I was very much in the power of anyone who chose to exercise it, since I hadn't the faintest idea where to get more of the stuff. That was something I'd have to discuss with Bert very shortly.

I tried forcing myself to breathe. I found I could squeeze liquid slowly out of my lungs and get it back equally slowly, but it hurt and made me feel even dizzy than being right side up and upside down simultaneously. The liquid went into my windpipe; I could feel it, but there was no tendency to cough. I still think that must have been one of the trickiest parts of the conversion procedure, considering the nerve and muscle activity which coughing involves.

The presence of liquid in my windpipe, expected at it was, raised another question. I certainly couldn't talk, and I didn't know the sign language which appeared to be standard here - didn't even know the spoken language on which it was presumably based. I had a long job ahead of me if I were to communicate with the local inhabitants. Maybe it would be better to bypass any such effort; if I could find out all I needed to know from Bert, language lessons would be a waste of time.

I could hear, though. The sounds were almost strange, though some might have been the hum of high-speed motors or generators. There were whistles, thus, whines - nearly everything there is a word for, but none of it exactly similar to anything familiar, and one particular class of noise completely missing. The gabble of speech which drenches every other inhabited part of Earth was totally lacking.

Nearly an hour passed according to my watch, before anyone appeared (the watch itself was a solid-state radioactive-powered affair which had not been designed with sea-bottom pressure in mind, but had come through the change perfectly). I spent most of the time cursing myself - not for making the change, but for failing to take advantage of the time between decision and action by getting more information from Bert.

The new arrival was young and quite decorative - but I didn't fall in love with her. The response was mutual. She waved me back to the cot and examined my dressings with an air of competence.

When she finished, I tried to call her attention to my lack of swimming ballast. She may have understood, since she paid courteous attention to me and nodded agreeably after I'd finished my gestures, but she left without doing anything constructive about the matter. I hoped she was going to call Bert.

Whether she did or not, he was the next to enter. He had no extra ballast with him, but he did have the writing pad. This was even better. I reached for it and buckled down to work.

I'd been restricted to communicating only by written note before, but not since leaving grammar school. In those days it had had a certain thrill, being an illicit activity in study hall; now it proved to be purest nuisance.

In something over two hours, we settled:

That I was a fully naturalized citizen of this place, and entitled to go where I pleased and do what I wanted short of obvious conflict with the interests of others;

That I was not only permitted to examine the power-generating units, but was expected to familiarize myself with them as soon as possible;

That I could visit Marie at her submarine whenever I felt like it, and I had the blessing of the Council and the rest of the population in arguing with her; and

That I would be expected to support myself by farming until I demonstrated some different and at least equally useful way of contributing to the general welfare.



That was all. Often in the past I'd held a lengthy conversation with someone, and after he was out of sight had remembered other things I'd wanted to say; but down here this sort of thing wasn't an incident, it was a habit.

It wasn't so much that one forgot to bring up some point or other. As a rule there wasn't time to cover even the ones remembered. I've never appreciated the gift of speech so much in my life. Those of you who feel, after finishing this report, that I should have learned certain key facts sooner than I did will please remember this difficulty. I don't say I shouldn't have been quicker, but I do claim some excuse for failure.

The whole thing was not merely annoying; it did wind up making me look more like a plain fool than I ever have before or hope to again. What is really embarrassing is that so many people who have heard only this much of the story can see already where I went wrong.

I had no real enthusiasm for farming, though I was curious about how it would be conducted on the sea bottom. I did want to learn about the power plant, but even that item I postponed. I asked Bert first of all to guide me to Marie's sub. He nodded and started swimming.

The trip was made without conversation. Maybe Bert was used enough to swimming by this time so that he could have written and read while doing it, like a city secretary doing a crossword puzzle as she strolls out to lunch, but I certainly was not. I simply looked around as I followed him, noting everything I possibly could.

The tunnels were long and for the most part straight, but they formed a hopeless maze as far as I was concerned. I would be a long, long time learning to find my way around unaided. If there was anything corresponding to an ordinary

street sign, I failed to spot it. There were all sorts of color patterns on the walls, but I couldn't tell whether they meant something or were merely decoration. Everything was brightly lighted.

The place wasn't just tunnels, either. There were large rooms of all shapes, some of which might have been business plazas or shopping centers or theaters or almost anything else one can think of where a lot of people congregate. I seldom saw any real crowds, but there were enough swimmers around to support the claim that the population was quite large - not surprising if it had been going for several generations. I was gradually coming to think of the place as a country, as Bert had claimed, rather than an outlaw organization; a country which had never lost its identity by subscribing to the Power Code. This might indeed be the case - it might have been here longer than the Code had. I didn't know how much more than the eighty years Bert had mentioned might be in its history. That was something else to find out.

I never got good at judging distances in swimming, and some of the corridors had their traffic assisted by a pump-driven current, so I don't know how far we went before reaching the submarine. As a matter of fact, I still have only the vaguest notion of the size of the whole place. At any rate, we finally emerged from a narrow corridor into one of the big chambers under an ocean entrance, crossed beneath the circle of blackness which gave on a mile of salt water, went on down a much larger passageway for perhaps two hundred yards, and found ourselves at the entrance to a fair-sized room in which one ordinary Board work sub, loaded with external ballast slugs as my tank had been, lay cradled on the floor.

Bert stopped just outside the entrance and began to write. I read over his shoulder as he produced 'I'd better stay outside. She's firmly convinced that I'm Judas Iscariot, Benedict Arnold, and Vidkun Quisling all rolled into one. You'll have enough trouble appearing as you are without me beside you. Have you decided what excuse to offer for making the change?'

I nodded, seeing no need to waste time writing out details more than once, and took the pad and stylus. Bert looked a little expectant, but I waved farewell to him and headed for the sub. When I looked back, just before reaching it, he was gone. I then remembered that sometime fairly soon I was going to need ordinary food and presumably, even more seriously, the oxygen food. I still didn't know where to get them.

Chapter Thirteen

I couldn't see anyone through the ports of the sub as I approached, though I circled all the way around it. Apparently Marie was asleep. I wasn't sure it would be sound policy to wake her up, but I finally decided to take a chance. I tapped on the hull.

'If that's Bert, clear out. I'm busy thinking!' The words were clear and understandable, but they didn't sound at all like Marie's voice. I can't describe just what they did sound like. There are overtones



produced by the human vocal cords which don't usually get through the impedance-matching equipment of the listener's middle ear — one of the reasons one's own voice sounds so unfamiliar in a recording. Being immersed in a fluid which carries sound at about the same speed as water does, and having that fluid on both sides of the eardrum, makes an even greater difference. As I say, I personally lack the words to describe the exact result.

I tapped again. The second response was equally clear, but I've promised Marie not to quote it. I got annoyed, and my third tap came as close to pounding as the liquid environment permitted. That was a mistake.

A man can stand the explosion of a stick of dynamite a hundred feet away, in air, quite easily. The noise is uncomfortable but not by itself dangerous. If he's swimming at that distance from the same stick when it detonates under water, though, he can count on being killed.

My fist didn't pack the energy of a stick of dynamite, but things might have been less painful if it had. At least I'd have been comfortably dead. My eardrums didn't actually break when the shock wave hit them, but the sensations can't have been much different. I was long in recovering to permit Marie to come to the port, recognize me, get over whatever shock the recognition may have caused her and freeze up again.

She claims now that she was glad to see me for the first half second or so. She says she even yelled my name, in spite of my known feeling about that. By the time I was aware of my surroundings again, though, she was certainly showing no sign of pleasure. She was glaring at me. I could see her lips moving, but I couldn't yet hear her words over the ringing and pounding still in my ears. I held my hands over them for a moment and tried to signal her to wait, but her lips kept right on moving.

I gave up on the signals and got to work with the stylus. By the time I had filled the sheet with writing, I was beginning to make out her words. They made it clear why Bert had preferred not to stay with me. Angry as she was, though, she was still sane enough to pause and read what I had written when I held it up to the port. The words had been carefully planned, on the basis of what Bert had told me about her current attitude.

What I wrote was, 'Don't say anything likely to get me in trouble with these people. Why did you stay down here?' That was supposed to divert her attention from the question of why I was here myself, apparently enjoying all local rights and privileges. It might even give her the thought that I was playing spy. It was partly successful; at least, the strong language stopped, and she took time out to think before she spoke again.

Then she answered, 'I'm here to find Joey. He disappeared down here — you know that as well as I do. I'm staying here until I know what's become of him.'

'Wouldn't there be some point in going up to tell the Board about this place?' I asked. 'Then a really well manned force could come down and accomplish something constructive.'

I thought of that,' she admitted, 'but when Bert told me I could go back and report everything I knew, I was sure there was some trick behind it. Besides, I was more worried about Joey, and they wouldn't tell me anything about him.'

'Didn't Bert say you could stay if you wanted?'

"Yes. That's what made me suspicious. How could any decent person agree to stay here? It was just a trick to help make sure I couldn't go back. Once you're changed to breathe water, you can't change back, obviously.'

I almost pointed out that the liquid wasn't water, and then I almost asked what was obvious about her conclusion. I realized that the first point was irrelevant and that she'd dismiss it as quibbling, and the second was likely to bring up the subject of my own conversion. Besides, any argument was likely to force me to use information I'd have to admit came from Bert, so she probably wouldn't believe it. Come to think of it, I realized with a sudden jolt, I had only Bert's word for it that the change *was* reversible to the extent of letting me go back to the surface. Well, if he were mistaken or lying to me, it was too late now. I was writing again as those thoughts flickered through my mind.

'But what do you expect to accomplish just sitting here in your sub? What *have* you done in the six weeks since we last saw you?' She ducked that one.

'I don't know what I can do here, but if I leave I'm shut -off from further information. I still hope I can get something out of Bert. I'm sure he knows where Joey is, even though he denies it.'

'How can you get any word out of him if you won't talk to him? You told me to get out just now when you thought I was Bert.'

She grinned, and for just a moment looked like the Marie I knew back at Papeete.

'I just think it's better technique to keep *him* wanting to talk to *me*' was her answer. I couldn't understand the rationale of that one, but there was much about Marie I'd never understood, and she knew it.

'Well, I'm here now,' I wrote, 'and whether it turns out to be for keeps or not I can at least move around



and get something done. Subject to your approval, I plan to devote my time to getting information which you can take back to the surface when you go — I assume you don't plan to spend the rest of your life here.'

'I don't plan it, but I rather expect it,' was her reply. Before I could write any comment she went on, 'Of course, I'll have to give up and start back some time, but I know they'll dispose of me when I do. That's assuming they did the same thing with Joey, and I'm very sure they did. If I do find him alive, of course, what I do will depend on him.' She fell silent, and after a moment to make sure she had finished I wrote again.

'But you'd like me to find him for you.'

She looked at me with what I hoped was a tender and sympathetic expression, though I couldn't be quite sure through the port. She knew how I felt about her, of course. I'd never made any secret of it, and even if I'd tried to, a woman would have had to be a lot more stupid than Marie to miss the evidence. Most of the girls in our section *are* more stupid than she, and it's a standing joke with them. Marie didn't answer for several seconds, and I decided I still had the conversational ball. I resumed writing.

'Of course, he's part of the job anyway. I came down to find out what I could about the three, of you. I know about Bert and you, now, but the job's not finished. There are other things here to learn. I've got to pick up the technical information that makes this place possible, especially its ability to ignore power rationing, and there's a little question which talking to you has brought up. If you're so sure they've disposed of Joey, and are planning to do the same with you when you leave, why do you think you're still alive? They could have holed your sub without the slightest difficulty - or for that matter spared themselves the considerable trouble of supplying you with food and air.'

'I've been thinking about that last,' Marie answered, this time without hesitation. 'When I first staged this sit-down, it was meant to test them on that point - ' She saw me start writing and stopped while I finished.

'Weren't you taking some chances with that sort of test?' I asked. 'Suppose they'd failed it. Would you have lived to report the results?'

'Well, no. I wasn't really caring what happened to me about that time, but I did think I stood a chance of driving out of here and making a decent try for the surface, with something really worthwhile to report.'

'Marie, I've always thought as much of your brains as of your other qualities, but for the last few minutes you've been dithering. You must know it. Are you going to give me straight data, or do I have to work here even more alone than I'd hoped? I repeat, why do you think they haven't killed or at least starved you?'

That was taking a chance, I realized, but it worked. She started to frown, then fought it off with a visible effort, thought for a moment with her lips pursed and then began talking more quietly.

'All right. I didn't trust any of the juice-breathers out there, and I'm not sure I trust even you' — I was grateful for the 'even' — 'but I'll take a chance. I've been doing a lot of thinking here; I've had nothing much else to do. I've come up with one explanation, and I haven't been able to think of any others or find any holes in it. It accounts for their not killing me and their letting you and Bert join them. It suggests that Joey might possibly be alive, though if he is it doesn't explain why he hasn't come to see me the way you and Bert have.' She paused to think for a moment and then went on. 'It's quite simple in principle, but it could do with some detailed facts. That's one reason I'm telling it to you.' She paused again, and looked at me hard before going on.

'They must *need* us. There's something they're short of that you, and Bert, and Joey, and I, and maybe anyone else from the surface can supply. It's the only sensible answer.'

I pondered that. It was a possibility I hadn't thought of, though I was not ready to accept it as the only sensible one.

'You don't think they might just be so pleased with their way of life - freedom from power rationing, they'd probably call it - that they just want recruits on general principles? That sort of thing has happened.'

'I know it has,' she replied. 'But I don't believe it has this time. You got that sort of thing back in the days of nations and political parties before the Board's necessity was realized.'

'If you think we've outgrown politics,' I retorted as quickly as the stylus would let me, 'you're less alert than I thought you were around our own office. And what's wrong with regarding this bunch as a nation? It's the picture I've been forming of them.'

'Nation? You've a short circuit between the ears. They're just another bunch of power-wasters. There aren't enough of them to be a nation.'

'Do you know how many there are?'

'Of course not. I've been in no position to count. A few hundred, I should think.'

'You think a few hundred people could build a place like this? Or even a small part of it? There must be



miles of tunnels here. I swam for the best part of an hour to get from where they worked on me to this place, and it was a maze. I haven't seen any part of their power unit yet, but it must be huge to supply all this volume with light, and there's that big tent area outside - you must have seen that. How could a few hundred people possibly do such a job? On the surface, with unlimited time and normal construction machinery, sure; but what standard machinery could have been used here?

Marie had wanted to cut in a little way back, but waited for me to finish. There's no point in trying to quote the next few minutes verbatim; they boiled down to the fact that she hadn't seen the lighted area outside. She'd spotted a work sub while she was prowling around searching for Joey, had followed it, and wound up at an entrance apparently out of sight of the 'tent'. Apparently there were a lot of entrances. She had no opinion to offer on the lighted area, and I couldn't help feeling that she didn't entirely believe my account of it.

She hadn't been captured. She'd followed the sub to the entrance, found she lacked ballast enough to get through the interface between the liquids and simply stayed there, blocking traffic, until they'd loaded her down and towed her inside out of the way. Women are interesting creatures, with interesting powers. I wasn't sure *I* believed *her*, but decided not to tell her so.

'All right,' I finally summed up on the pad. 'The jobs for me seem to be to find Joey or reliable word of him; to find a specific, convincing reason why they are so willing or eager to have us join them; to get reliable information about the size and population of the place; and to get the technical information about their power plant.'

'Right,' she nodded. 'I won't demand that you do all that without confiding in Bert, because I have no way of enforcing such a request. I'll just say I don't trust him, myself.'

'I still don't see why not. He's changed over to this high-pressure scheme, but so have I, and you've decided to trust me, I gather.'

'Don't remind me of it. It's a point against you. Still, I'm hoping that with you it's just a cover-up. After all you seem to believe it's a reversible change, even if I don't, judging by your expression when I said it wasn't. I hope for your sake you're right.'

'Why shouldn't Bert have believed the same and had the same motive?'

'If that's the case, why has he been down here a year? If he can come back, he must be up to something, because he hasn't. If he can't he's up to something because he must have told you it *was* possible. Think it over.'

I did and found myself with no good answer. The best I could say was, 'All right. I'll be careful.' I had started to swim away when she called my name. Irritated, I turned back and saw her face pressed close to the port. As I looked she spoke again, much more softly, so that even immersed in the liquid I could barely hear.

'You're a pretty good egg. If it weren't for Joey —'

She broke off, and her face disappeared from the port.

I swam away, listening to my own heartbeat and trying to organize my thoughts.

Chapter Fourteen

There was no sign of Bert in the corridor outside, and I didn't dare wander in search of him. I did remember the way back to the near-the-ocean entrance and swam there in the hope that it was a logical place for him to be waiting.

There were at least a dozen people in the big chamber, and more could be seen dimly in the darker water above, but none of them was Bert. I could think of nothing to do but wait for him, as far as the main program was concerned. But it did seem a good time to pick up a little local education.

I swam up to the interface and hesitated. Other people were going through from time to time. I decided I'd better watch their technique before I tried it myself.

It was simple enough. All one did was cling to a ladder, remove one's ballast belt and hang it on one of the numerous hooks lining the rim and swim through. However, everyone who did this was wearing helmet and coveralls, presumably to keep the special liquid in their mouths, ears and so on. Maybe ocean water would hurt lungs, for all I knew. Anyway, no one stuck an unhelmeted head through the boundary, and I decided to play safe myself even though I couldn't see what the danger, if any, might be.

Several of the people around were watching me, I noticed. One or two of them had expressions of concern on their faces. One gestured at me, but of course I couldn't read her signs. She watched me for a moment, saw that I didn't answer, made another flickering series of hand motions to those around her



and then swam over to me. She pointed to the water and then to me and raised her eyebrows quizzically. The nature of her query was easy to guess, though the girl herself commanded more attention than her signals.

She might have been the one I had seen outside, though there was no way to be sure. There were several others in the group who were just as likely to be that one. She had straight blonde hair, cut short in a bob which could easily be accommodated in one of the swimming helmets. She was about five feet three in height and would have weighed about a hundred and ten pounds out of water. She was wearing a two-piece affair which was a long way from being a coverall, but protected much more acreage than a bikini. Her face was rather harrow, and I could make no guess at her regional origin.

In response to her question, or what I assumed to be her question, I raised an arm toward the water surface, very slowly, watching her with raised eyebrows as I did so.

She gave a violent negative headshake, wrapped her arms tight around herself and shuddered realistically. I could also interpret that and was annoyed with myself for not remembering that the water outside would be cold. It was useful data; it justified the inference that the liquid we were in was not a very good heat conductor, or I'd already have felt the chill of the ocean water only a few yards away. Of course it couldn't be too poor a conductor either, or we'd be having the standard spacesuit problem of getting rid of surplus body heat. I hadn't been conscious of either heat or cold up to this moment. Now I wished I had a thermometer so that I could form some numerically meaningful opinions.

I held up one finger and joked it toward the boundary, asking the girl the same question with my eyebrows. She shrugged, as though to say it was my finger, so I pushed it on through.

The temperature was bearable, but I could see why the swimmers wore coveralls. I thought I could stand it for a short time if I had to, but saw no reason to make a test of the matter just then.

I thought it would be more useful to start to get familiar with the normal communication method of these people. In spite of Bert's remarks and my earlier try through the tank walls, it seemed possible that some of them might know at least a little of some language I did. I showed the girl the writing pad. She nodded at the sight of it and flashed a sidelong smile at the others who were drifting in the vicinity. I wrote a short sentence in each of my more usable languages and held the pad up for her to read.

She looked at it courteously and carefully, but smiled and shook her head. I showed it to the others, with much the same reaction. Then there was a lengthy session of flickering fingers as they held a conversation among themselves. Several of them, including the girl, looked as though they would have laughed if it had been physically possible. Then the girl took the pad and stylus from me, and began to make marks of her own.

The stylus moved very rapidly, but not in a set across-and-back lines like ordinary writing. It was more like drawing, from where I floated. It took her perhaps thirty seconds to finish, then she handed the tablet back to me and let me gawk at it. I gawked.

What she had done is impossible to describe in real detail, though a general idea can be given. In a way, it was rather like an electrical diagram, with straight lines going from one place to another, most of them parallel to the edges of the pad. Sometimes there were tiny gaps in the lines where one would have intersected another; sometimes the junctions were marked with dots; sometimes one line went through another with no effect on either. Here and there in the maze were tiny patterns, incredibly complex considering the time that had been spent on them. None of these looked exactly like an electrical symbol I knew, but all left a vague feeling of familiarity. The whole pattern was *almost* a picture. It gave a tantalizing effect of being something I should recognize but couldn't dig out of the back of my mind. I kept trying to interpret it in terms of a circuit diagram, which as I said it vaguely resembled, but got nowhere. I tried to think of it as one of those trick drawings all made out of straight lines which become modern art every few decades, and got no further. I had to shake my head as the girl had done.

I cleared the sheet and tried some more languages, this time ones I don't know at all well. All I was hoping for was evidence of recognition. I didn't get it. Not a trace. This was very odd, since the dozen or so languages I had covered represent native tongues for something like three-quarters of the Earth's population and included at least a few known slightly by educated people everywhere.

The girl reciprocated my second effort with another of her own. I could see that it differed in detail from the first, but it bore a strong family resemblance to its predecessor, and I couldn't make any more sense out of it. If I'd had a camera able to work under the circumstances I'd have photographed it on the chance that it had something to do with the power plants, though even at my most optimistic I'd have admitted it was a very slim chance.

The thought of plans in general gave me an idea, though. I cleared the pad again and drew in its center a small sketch meant to represent the room we were in, the various passages leading from it and the chamber where Marie's sub was berthed. The girl didn't get the idea at first, so I swam over to one of



the passages whose entrance I had indicated, looked down it to see whether it were straight or not and extended the appropriate lines on the drawing.

That seemed to get across. She nodded her head after some more hand-talk with her friends; then she gave me a 'so what' look. I handed her the pad and stylus and gestured around, hoping she'd see I wanted a map of the place.

They understood this, too, I felt sure, but the hand-talk went on for a good deal longer. I hoped they were merely arguing about the best way to give me the information, rather than whether to give me it at all. What I would have liked best was a regular chart of the place, not someone's freehand sketches.

The argument, if that's what it was, was interrupted by Bert's return. It was a relief to be able to converse understandably, however slowly, once more, but Bert had his own ideas about the subject of conversation. He took the writing materials from the girl and cleared the pad without a glance at what was on it.

'Did you get any co-operation out of Marie, or has she lumped you with the rest of the outcasts?' he asked.

'I think I'm on probation,' I replied. 'Nothing will really satisfy her but a definite report on Joey.'

'Well, we can't give one. To the best of my knowledge he never got here.'

'You didn't spot his sub in the vicinity, even?'

'No one reported it.'

'But how about your sonar?'

'We don't use it except under very special circumstances. It would be too likely to be picked up. We're quite willing to have the world know about us, but only if they find out *all* about us. Don't you have that picture yet? We simply don't want to be lumped in with the power-wasters the Board is always after, and you know perfectly well that's the picture people will have if we don't get a chance to explain.'

'I suppose that's true. It's the picture Marie has now, and she seems quite fond of it. I wonder if just explaining is really going to be enough.'

'It would be if people would believe the explanation.' I said nothing about the profundity of that remark.

'You've been explaining to Marie for six weeks, and she doesn't.'

'No, we haven't. We've been talking for six weeks and she doesn't listen. There's a difference. She refuses to discuss anything except Joey. I think your greatest service, both to us and to the Board, would be to get her to pay attention to a genuine description of the whole situation.'

I digested that for half a minute or so. Several of the people who had been there when Bert arrived had now swum away, but the girl and two or three others were still watching with interest. They were deeply absorbed in seeing what we were writing on the pad, crowding in to look at each message in turn over the writer's or intended recipient's shoulder. The girl always seemed to get the best place. Standards of courtesy seemed a bit old-fashioned compared with most regions at the surface.

'You may be right,' I wrote at last, after trying to fit what he had said into the program I had outlined for myself. 'That would seem to mean that I'll have to see this whole installation with my own eyes, so as to be able to claim first-hand knowledge.'

'Precisely. Come along. With this job, you may be spared farming after all, but at least you'll have to see the farms.'

As a matter of fact, I'm getting hungry, and it must be even longer for you than for me since the last decent meal.'

I had no objection to this thought, and followed him as he swam off through still another of the passages. The girl and three others, after a couple of gestures, followed us.

As before, it just wasn't practical to write and swim at the same time, so I had plenty of opportunity for thought as we traveled. I wasn't able to use it very constructively, and there's nothing much I can say about the trip except that it took around fifteen or twenty-minutes. Absolutely nothing of interest, and as far as I know nothing of importance, happened until we reached a doorway much less regular in shape than the circular and rectangular ones I had seen so far.

The light on the other side was fainter than in the tunnels, but brighter than in the ocean beyond the regular entrances. I followed Bert with quickened interest, guessing what I'd see.

Chapter Fifteen

I wasn't surprised to find myself suddenly a few yards above the sea bottom; I was 'outdoors'.

The passage we had just left was cut into a sloping rock face — as a matter of fact, the passage itself



was a long way from horizontal, as I could now see. I had not been aware of swimming uphill during any of the trip. There was, I reflected, little reason why I should have been.

A few yards below me a stretch of sea bottom extended into the distance. Once out of the tunnel I could see that it was quite well lighted. Looking up, I could see perhaps fifty feet above me the glowing surface of the 'tent' roof. The bottom itself might as well have been under five feet of water instead of five thousand. It was covered with vegetation.

I didn't recognize any of the plant life, but that was natural. I might have learned some descriptive biology, or natural history, or whatever it should be called if I'd been born before genetic manipulation became a practical art, but I wasn't and didn't. Presumably this plant life had been tailored to provide food for the local population, and the light was there to permit the plants to grow.

It was almost as good an excuse for the wasted kilowatts as the one Bert had given me. Just once, several years before, I had tasted natural food confiscated from a waster, and I had sympathized with the fellow even then. I'd had to rehearse the moral precepts very firmly, several times a day, for weeks afterward. I'd finally recovered my normally healthy resentment of people who corner resources to give themselves pleasures denied to the rest of us, but it had come hard.

Bert and the others were slanting down toward the bottom, which was laid out in roughly rectangular patches with a different variety of plant in each. Other swimmers were around in fairly large numbers. Some appeared to be eating, others working. The precise nature of the labor was obscure, partly because of their distance and partly because I knew no more of farming than anyone else had for the last century or so.

My companions were now pulling round, greenish excrescences from the plants and taking bites from them. The girl handed one to me, and watched with evident amusement while I looked it over and finally took an experimental nibble.

I couldn't quite make up my mind whether I liked it or not. It was very different from any ordinary tank alga and was not in a class with that forbidden taste of years before, but it was interesting. I tried another bite, decided it was good and finished it off. The girl showed me how to get others from the plant without a major struggle — they had to be twisted in a special way before the tough stems would yield — and then left me to my own devices while she ate several of the things herself.

Then she beckoned me to follow, led the way to another patch, and showed me a different fruit. I made a very satisfactory meal in the next quarter of an hour.

I wondered which, if any, of these growths was the oxygen source. Perhaps they all were; they were all green and presumably photosynthetic, but none were giving off visible bubbles as food-alga tanks are always doing. I decided not to worry about oxygen; there was no reason for Bert's friends to kill me off in such an indirect and inconvenient way as by depriving me of that. They'd already had too many chances.

It suddenly dawned on me that I was lumping Bert in more and more closely with the local dwellers, in my own mind. I don't believe most of what I read about the subconscious — it seems to me to be too much like astrology, alcohol, and other excuses for sloppy thinking and incompetence - but as I review consciously the events of the last few hours it looked more and more as though my changing attitudes were justified. He seemed to regard himself more as a local citizen than as a Board worker with a job to do, and maybe I'd been picking up his attitude without really noticing the evidence.

There was his choice of words, for example. I'd been devoting more attention to what he said than to the exact way he said it, but now that I thought of it there were a lot of 'We's' and 'Us's' which didn't really belong in the thoughts of a good Board official under the circumstances - especially if he were really sure that no one but I could read what he was writing.

Maybe Marie wasn't being so unreasonable after all.

I glanced over at him. He was eating, like the others, but he seemed to be taking very little part in the conversation which the unoccupied hands of the eaters were carrying on.

I don't really blame myself for not seeing anything very significant in that at the time. If anything, it reassured me; it was consistent with his claim that he hadn't learned much of the local talk.

But after the meal I began to feel bothered again. He took me everywhere I showed the slightest desire to go. He explained, convincingly, everything I asked about. There was the tent roof, for example.

When I wrote a question about that, his face turned an odd purple color; when that had faded, he wrote. 'Careful. With liquid in your lungs, laughing can kill you. They cut a key nerve in your coughing reflex when they changed you, but you can still laugh if you're not careful.'

'What's funny about that question?'

'Well, I can see where you'd get the idea of a fabric over this place, but I assure you no one has gone to any such trouble. What you see is simply the interface between the liquids.'

'Why doesn't it look the same here — translucent instead of transparent — as it does at the entrances? Why do you have special entrances, for that matter?'



'We keep the entrances cleared off. There's too much area for that — several square miles — over the farms. Stuff in the ocean is settling to the bottom all the time, and stuff formed on the farms is floating upward. Some of each - a very small percentage, luckily — has density between that of our liquid and water, so it collects at the interface. As a matter of fact, a good deal of living matter grows there, though fortunately it's a monocellular stuff. If there were more of it, we'd have to clear anyway to let light through to the plants, which would be quite a project.'

I should have asked him right then, I know, why the lights were up in the water instead of down closer to the plants. It was just one of those things that I didn't. If he'd answered, it would have saved me a good deal of later embarrassment, though I'm still not sure that he would have. I suppose he would, on the basis of what I understand now of his reasons for acting as he did.

When I mentioned the power plant, he started off immediately, with the same group trailing along. I wondered whether they were guards, secret agents, or curious idlers, but didn't waste much time on the question. There was no way to tell, or even to make a decent guess. In any case, with the power plant next on the agenda, no other question was very interesting.

After a time we reached the first large closed door I had seen since emerging from my tank. It was much like the one which had admitted my container to the conversion room. Bert made a few gestures to our escort; they began a longer conversation among themselves, but he didn't wait for them to finish. He began opening small lockers in the tunnel wall, and extracting coveralls which looked like the ones used outside in the ocean. They were complete with helmets.

'What's the reason for these? Temperature?' I wrote when he gestured me to put one on.

'No. You probably haven't found out yet, and I hope for your sake you don't, but immersed as we are in liquid we're very sensitive to intense sound waves.' I didn't interrupt with my experience, but for once I was sure he was telling unvarnished truth. 'The power plant is very efficient, but there's still a trace of noise — quite enough to kill an unprotected person. Get the suit on and make sure it's tight.'

I obeyed. I had a little trouble; the garment wasn't as simple as it looked. One of the buckles proved to have a sharp corner which cut quite a deep gash on my hand and I wondered what sort of quality control would put up with that sort of design. The drops of blood looked a little strange, bright-red globules rising from the wound, but the injury was minor. By the time Bert had solved my problem with the buckle the bleeding had stopped.

He checked my coverall, especially the wrist and helmet junctions, very carefully. The others had also dressed and were doing the same for each other. Gestures which even I could interpret signified that the checks were complete, and Bert turned to the door.

He manipulated a dial at its side, and the great valve — large enough to accommodate a small work sub — swung easily open. He waved us through, waited until we had passed and closed the portal behind us. It struck me again that his air was not merely one of familiarity but of authority. How, in a single year, could a Board agent have made himself so completely trusted by these people? A Board agent, of all people on Earth the most likely to take action against them and their way of life? Could he have been in contact with them even before his disappearance from the surface a year ago? Could Marie be right? And if she were, what was I getting into? I had trusted Bert Whelstrahl completely when I first saw him down here and had tossed off most of Marie's claims as coming from a woman nearly hysterical with grief; it had seemed likely enough that her Joey - not that he'd ever been hers, in his own estimation - had actually never reached this place. Enough other things could happen to make a one-man sub disappear in the Pacific.

Now I was wondering, deeply. But there were other matters claiming attention.

Chapter Sixteen

For the first time, I found myself in a tunnel which was obviously slanted steeply - the pull of my ballast belt let me judge 'up' and 'down' easily enough when I paid attention to the matter. We were heading downward at fully sixty degrees. The tunnel lights, the only distinct features on the walls, were going by at a speed which showed we were being helped by pumps; there was certainly a downward current. I wondered if we'd have to swim against it on the way back and decided it wouldn't be possible. Either they'd reverse the flow, or we'd use another tunnel.

I didn't notice any temperature change, though I knew we were going to examine a heat engine. Maybe this bunch was moral enough about energy waste when it came to the sort of leakage which robbed a machine of efficiency, no matter how they behaved about it afterward.

I couldn't guess how far down we went before reaching the control chamber. It was certainly hundreds



of feet, probably thousands, possibly as much as a mile. I did see the charts of the layout later on, but the peculiar ideas of scale used by their makers still defeats me. It was certainly far enough down to present a hopeless obstacle to any brute-force defense against pressure as armor.

The room itself was big enough to make the far end hard to see. The liquid, as I guess I may have forgotten to mention, scattered light just a trifle and gave objects more than fifty yards or so away a foggy appearance.

The room, though, as a control chamber was almost shockingly conventional. It contained along one wall a pattern of lines which even I could recognize as a distribution net. Below this was another pattern, harder to recognize but of noticeably vertical orientation, and I suspected that it indicated the working-fluid circuits between the heat source far below and the converters and heat sink at the top. A heat engine of any sort works on pretty basic thermodynamics, and its diagrams are apt to resemble those of its relatives whether it's a steam turbine or a thermocouple.

Along the lines of both diagrams were indicators, mostly of familiar dial-and-needle type, switches and rheostats. Nothing was mystifying; it was a power plant control at a glance. That is, it could be recognized at a glance. It could be learned, given luck and competence, in a month or two.

Thirty or forty swimmers, suited and helmeted like ourselves, drifted a few feet from the control wall, all their attention focused on it. This was a little surprising. I would have expected fewer operators on a board of this size. If they were all necessary for manual control, it was another mark against the general level of technical competence here, like the sharp buckle. I hoped that -poor coordination on their part would merely result in nuisance rather than catastrophe. No doubt there were fail-safe breakers in the electric distribution net and some sort of emergency bleed-offs here and there in the fluid lines, but even so that crowd of operators gave a certain primitive air to the whole thing. I watched thoughtfully. The ones who had come in with us looked with as much interest as I felt; I got the impression that they hadn't been here before either. Well, that was quite possible. The whole population could hardly be composed of power engineers.

It added to the mystery, though, because I knew that Bert wasn't one either. He had a general engineering background like my own, which of course you need to be any good at tracking down power waste. Why should he have authority around here?

He turned and made a couple of gestures at our escort. Then he wrote me a message.

'Don't get close enough to distract any of these people. More than half of them are trainees.' That put a slightly better light on the situation.

'You take your education here seriously,' I answered.

'You bet we do. You'll see why, soon. Swim around as much as you want and look at what you want — you know enough so I don't have to watch you like these others. Just don't get in front of an operator.'

I nodded. For the next half hour I did just as he had written, examining the entire board in as much detail as I could. The arrangement made more and more sense as time went on. One very surprising reason for this was that the dials and control knobs were marked in perfectly ordinary numbers. I hadn't expected that, after seeing what seemed to pass for writing down here.

The numbers were alone, unfortunately - no units such as volts or megabars were given. In spite of this, the position of each instrument on the diagram which formed the board usually gave a pretty good clue to its purpose. In less than an hour I felt I understood the system pretty well.

Ten shafts led down to the heat absorbers at the source -presumably a magma pocket. The details of the absorbers themselves weren't obvious from the board, but I knew enough about volcanic installations to guess. I'd done a waste investigation in Java once. The working fluid was water; the still which took in sea water and desalted it, the electrolysis units which got alkali metals from the recovered salts, and the ion injection feeds were all obvious on the board.

The MHD converters were also ten in number, but all exhausted into a common condenser which appeared to be cooled by outside sea water. It did not serve as a preheater for the still, which seemed wasteful to me. Without units on the gauges I couldn't be sure of the net power developed, but it seemed obvious that it had to be in megawatts at least.

I hadn't noticed the sound of which Bert had warned, but perhaps that was because of the suit. I took a chance and loosened slightly one of the cuffs between sleeve and glove. There *was* sound, a heavy drone like a vast organ pipe and no doubt due to the same physical cause. It wasn't painful, but I could tell that removing the protecting suit entirely might be unwise. I wondered how close we actually were to the steam tunnels which must be the source of the hum. Even more, I wondered about their maintenance, but I had to do without details for the time being.

The people who had come with Bert and me had stayed farther from the board, presumably because of his orders. They watched a while what was going on, but gradually began talking to each other, judging by their hand motions. They rather reminded me of school children who have lost interest in watching the film. Once again I was reminded of the oddness in Bert's being able to give orders, or even act as a



guide.

He himself, after the first few minutes, paid no attention to the people who had come with us. He had waved to me in a gesture which I had interpreted as meaning that he'd be back later and swam out of sight. I assumed he would be and kept on with my inspection of the board.

For a good deal of the rest of the hour, the girl and her companions followed me around, though without getting as close to board and operators as I did. They seemed to be more interested in me than in the engineering. I considered this understandable in the case of the girl and supposed the men were just staying with her.

I finally decided that I had made all I could of the board and began to wonder where Bert had gone. There seemed no way to ask; he had taken the writing pad with him, and anyway the futility of that method had been established. If there had been among my satellites someone not present at the earlier experiment, I might have been tempted to try again anyway, but as it was the absence of writing gear was more of a challenge than a nuisance. This seemed to be a good time to start learning the local gesture language.

I swam away from the control panel to the farther wall, the others following, and began what I hoped would be a language lesson by the method standard in fiction. I pointed to things, and tried to get the others to use their gesture-words for them.

To say that it went badly is understating. It went so badly that I wasn't even sure whether they had grasped what I wanted by the time Bert came back. They had made lots of hand, arm, and ringer motions, both at me and at each other, but I saw no way of telling whether any of them were the names of things I pointed at, or symbols for the verbs I acted out. Probably I was missing a lot of the subtle motions and attitudes anyway, but I simply never detected a pattern repeated often enough to be learned. It was as frustrating an experience as I'd had since - well, for a few hours, anyway. Maybe a day or more.

When Bert did get back and saw what was going on he had another siege of near-laughter.

'I tried that, too,' he finally wrote, 'when I first got here. I'm supposed to be a fair linguist, but I never made more than the slightest headway. I hate to seem conceited, but I really don't think it can be done unless you start as a child.'

'You must have learned a little.'

'Yes, About fifty basic symbols - I think.'

'But you were talking to these people here. I got the impression you were telling them what to do.'

'I was, in a sloppy sort of way. My few dozen gestures include the most obvious verbs, but even those I can't do very well. Three-quarters of the people can't understand me at all — this girl here is one of the best. I can read them only when they make my few signs very slowly.'

'Then how in blazes are you in a position to tell any of them what to do? And how does that fact jibe with what you told me about *no one* here being able to tell people what to do?'

'I may have expressed myself badly. This isn't a very authoritative government, but the Council's advice is usually taken, at least on matters even slightly connected with physical maintenance of the installation.'

'And this Council has given you some sort of authority? Why? And does that mean that Marie was right in believing you'd deserted the Board and mankind and gone over to these wasters for good?'

'One question at a time, please,' he scribbled hastily. 'The Council didn't exactly give me authority. I'm making my suggestions as a member.'

I took the pad and cleared it, trying to catch his eye the whole time. I finally wrote, 'Let's have that again? My eyes must be fooling me, too.'

He grinned and repeated the sentence. I looked at him with an expression which sobered him at once, and he went on writing.

I'm *not* - heavily underlined - "here to stay, whatever Marie may think, and in spite of what I told you before. I'm sorry about having to lie to you. I'm here to do a job; what will happen after it's done I don't know. You're in the same position, as you know perfectly well.' I had to nod agreement at that point.

'I'm on the Council because of my linguistic skills and general background.' I was so hard put to it to make sense out of that remark that I almost failed to read the next one in time; I had to stop him as I was about to clear the board to make room for more words. 'There's a little more information about the place down here which I wasn't going to bother you with, but I've changed my mind. I'll let you see it, and you can decide for yourself how and whether to include it or allow for it in your job of getting Marie to make her mind up. I have my opinion on how it should be used, but you're entitled to yours. Come on. I want you to meet the engineer in charge of maintenance development work here.'

He swam off, and I went after him with the others trailing behind. I had no urge to talk, even if it had been possible. I was still trying to figure out how someone whose mastery of the local speech represented a slow two-year-old's vocabulary could have earned an official position on the strength of



his linguistic talents.

No doubt you've seen it by now, since I've tried to tell this fairly, but it was too much for me. I was so far behind the facts that I was even startled by something else you've probably been expecting. We swam into a sort of office opening from the far end of the control room, and I saw floating in front of a microfilm viewer, oblivious to the people around him, my good friend Joey Elfven.

Chapter Seventeen

That sight made a change in me. Bert had been a good friend of mine for several years. I had trusted him; Marie, admittedly, had not and had tried to get me to share her feelings, but I'd felt sure she was just brooding.

A few minutes ago I had been jolted when Bert confessed to a falsehood in his earlier talk to me, but I had still been ready to listen to his excuses. I would even have been willing to believe that I had misunderstood him the first time.

But he had also told me - written it in plain words, with no possible doubt about their meaning - that he did not know about Joey's whereabouts and that to the best of his knowledge and belief Joey had never gotten to this place.

Clearly and unarguably Bert Whelstrahl had been lying like the proverbial rug. He had known that Joey was here. He had known just where he was and what he was doing. Why should he tell such a lie to me and apparently to Marie? And having told it, why was he now bringing me face to face with the proof that he was a liar? And had Marie formed her impression by spotting some evidence I had missed? One thing was certain in my own mind. Whatever explanation Bert gave was going to have to be supported by some pretty good independent evidence before I could accord it any weight. So was anything else he said from now on.

These thoughts were interrupted by Joey's pulling away from his viewer and catching sight of me. The expression on his face indicated that Bert hadn't told him about me either. He was clearly astonished, and seemed delighted. He came over and shook hands violently, and seemed as frustrated as I was by the impossibility of talking. He looked around, probably for the writing pad, but Bert was already busy with the stylus. He held his words up for both of us to read.

'Joey, we know you're tied up for the next few hours at least, but will it be all right if I give you another assistant as soon as his first job is finished?' I appreciated his tactful skipping of my name and felt a little more willing to listen to his excuses when they came. I suspected from Joey's quick grin that he appreciated it too; a few weeks away from our section hadn't let him forget my chronic embarrassment at the handle my parents had inflicted on me or my self-consciousness about all nicknames offered as substitutes. 'More than glad,' he wrote. 'Check him out as quickly as you can, Bert. We need him badly.' He came as close to slapping me on the back as the medium permitted, grinned once more, and went back to his viewer.

I would have liked to make more of a conversation out of it, but was coming to see how anyone who had been here long might start to lose the urge for idle chatter. I could even think of a few people who would be improved by such a change in residence. I waved a farewell which Joey didn't see, and followed Bert back out into the control room.

I was going to put some pretty harsh questions to him, but he had the writing pad and circumstances made it difficult to interrupt anyone else's talk. He had stopped swimming and started writing by the time I got through the door.

'I didn't want you to know about Joey until after you'd had your talk with Marie,' were his words. 'In fact, I only just decided to let you know even this soon. I don't think she should know he's here, and I'm quite sure he shouldn't know that she is.' I grabbed the pad.

'Why not? It sounds to me like a dirty trick on both of them.'

'If she knows he's here she'll want to stay.' 'What's bad about that? You wanted me to stay, as you said, and I never denied she's more decorative than I am.' 'She shouldn't stay because her only reason for doing it would be Joey, and you know as well as I do how much good that would do her. You know he doesn't care two cents for the kid. He *chose* to stay down here, remember. If she learns about him and stays, she'll be giving him a hard time, and we can't afford to have that happen. The job's much too important. If he gets distracted, or changes his mind about staying here, it's trouble.'

'And why shouldn't he know about her?'

'For the same set of reasons. He'd know why she was here, and it would be as bad as though she were hanging around him in person. He never admitted it, but I think she was one of the reasons he chose to



stay here.'

'You mean he disappeared on purpose? That he knew about this place earlier?'

'Oh, no. He got here just as I did, and as Marie did. He spotted a work sub that didn't belong to the Board and followed it.'

I pondered. The story had some convincing aspects; Joey's attitude toward Marie was almost as well known as mine, though no one had ever convinced Marie of it. Few people had risked trying. Joey himself wasn't the sort of man who could tell a girl to run along, even if it were obviously the best thing for the girl as well as for himself. He'd feel it was somehow his fault for not falling for her.

'But why should you have had to lie to *me* about it?' I asked finally.

'Because you were going to see Marie, and I had some hopes you'd talk her into leaving. You'll forgive my saying that if you'd known Joey was here you wouldn't have been able to tell her that as far as you knew he wasn't. I'm not belittling your acting ability, but you wouldn't have believed it was necessary then.'

'I'm not sure I do yet. I'm still in the dark about this very important job Joey has to do and I'm supposed to help with.'

'True enough. We'd better get on with your education. Library next.'

'Will these guards, or whatever they are, be with us to the end?'

'It's hard to say. They aren't guards, just people who are interested. You ought to be flattered.'

'Oh, I am. I've never been a celebrity before.' It's curious how hard it is to convey irony by the written word alone. Bert missed it completely, as far as I could tell. He swam back in the general direction of the tunnel we had come down, and the rest of us followed him.

As I had guessed, the way up was along a different route - maybe I should say a different pipe - with the current, as I'd also expected, carrying us up.

As usual the trip was not enlivened by conversation, though I found it wasn't too boring; the girl swam beside me instead of trailing behind with the others. As before, I didn't know how long the journey took.

I'm not clear how they controlled the current. It had carried us down one passage, it carried us back to the same room through another, but in the room itself there was no trouble in stopping. Bert opened the big door, and we shed our coveralls on the other side. Then he led the way once more.

I was a little surprised, and a little more disappointed, to lose our escort at this point. They turned off into another tunnel a few yards from where we left the coveralls. No doubt they, too, had to work at times. I put them out of my mind, more or less, and followed Bert.

This is one of the points where it's hard to be detailed without being boring. A library is a library, even when it's upside down. The books were ordinary in shape and style, if not in content. The films and cards were in no way remarkable. Like unballasted human bodies, most of them tended to float. The chairs, tables, and carrels were on the ceiling, with racks under — no, I mean over — the chairs for parking ballast belts. Not everyone parked them, though; many readers had their belts still on as they drifted in front of a reading screen or floated with a book in their hands.

The images on the screens were all of the general sort the girl had drawn on the writing pad, second cousins to electrical diagrams or grad-school topology exercises. I watched several of the readers for some minutes each and got the opinion that while they were reading in the same sense that the word usually implies, there was an important difference in technique. They did go page by page or frame by frame, as the case might be, spending half a minute or a minute on each before going on to the next. But their eyes didn't follow the regular back-and-forth routine of a book reader. They wandered irregularly over each page, like the eyes of a man examining a picture.

Still, I reflected, that wasn't too surprising. The same thing would happen to me if I were examining a wiring diagram. I was gradually coming to understand the situation, perhaps rather slowly by some people's standards. I hadn't thought of engineering drawings as a language before.

Bert floated quietly around for several minutes, evidently willing for me to study the place by myself.

At last, though, he beckoned me over to one end of the room. There was an unoccupied film reader here, and a fairly large case of books. It took about two seconds for me to notice that these were written in ordinary languages. Chinese . . . Urdu . . . Latin . . . English . . . Russian ... I could recognize them all, even though I couldn't read many of them.

Bert started writing again.

'This stuff will tell you the story much more quickly than I can. It's no shock to you by now that a lot of people, not only Board workers, have found this place in the past. It's been here since before there was a Board. A lot of those people have stayed. Some of these books were brought here by them, some were written here by them. The information here is what convinced me of the things I told you — the business about attempts to get in touch with the Board about this place, and so on.

'Spend as much time as you need absorbing it. It's important that you get the whole story. I'll be back



when it's time to eat.'

He laid the pad under a chair — that's not quite the right way to say it; the pad was denser than the liquid, so figure it out for yourself - and swam off. There seemed to be nothing to do but start reading. Now, I don't have copies of those books and tapes. And I know Bert was a liar. But take my word for it, there were far too many of them for him to have produced himself in the time he was down here. Most of them were handwritten, though some had been typed. I spent something like eighteen solid hours just skimming the ones that were in languages I knew. (I shouldn't say *solid* hours. Bert did come back to take me to meals, and I also slept. There's no point in describing all the details of life, even if the environment did make some of them rather unusual). I'll boil down the picture I got of the situation to the smallest volume I can manage.

Chapter Eighteen

The place had indeed been in existence before the Board. During the final few decades before rationing, the separate political institutions which existed then were one by one coming to realize that man's energy reserves were indeed vanishing. A number of frantic attempts were made to avoid, or at least postpone, the consequences without offending public opinion - or rather, without disturbing public complacency.

My own historical knowledge is shaky, but I seem to remember that this was the period of the 'crash program', which cynical engineers of the time used to define as an administrative attempt to produce a baby in one month by making nine women pregnant. You must know some of the results, like the Mediterranean-Dead Sea hydroelectric tunnel, the Messina, Key, Ore and Arafura dams, the Valparaiso thermocouple, the Bandung and Akureyr volcanic taps. Some worthwhile, and even valuable, some monuments to inept politics.

You know the further consequences of some of them - the disputes over output use which led to a dozen minor wars, which in turn wasted more energy in a year than all the crash units together could produce in a human lifetime. And you know that the final result was the formation of the Board and general acceptance of power rationing.

During the period of friction several nations attempted to set up secret power plants, in the hope either of avoiding the covetousness of their neighbors or of providing themselves with energy reserves in case violent conflict did occur. Most of these 'secrets' were secret only to the general public of the nation concerned long before they were producing — such of them as got that far. A few lasted for several years after Board rationing began. It had been assumed that the last of these had been found and tied into the general power net many decades ago.

But here was another.

It was as simple as that — almost.

I didn't find in the records just what country was responsible. I didn't try very hard. The name would have been almost as meaningless to me, born more than half a century after country names had become merely geographical labels, as it would have been to Abraham Lincoln, who died probably twice as long before the nation in question existed.

It was probably a small enough country to be worried about its neighbors, and certainly a large enough one to be highly industrialized. The technique of deep-sea living which was being so effectively demonstrated to me at this moment was not a product of casual, or even of crash-program, research. It must have involved a very long development period. Knowing something of the customs of the time, I'm still amazed that the secret was kept — though I can guess at the steps which in those days would have seemed normal and proper to achieve this end.

Anyway, they set up the station and had it running nicely before the Board and rationing became a reality.

Remember, it was a *secret*. It had to be. Only a handful of people would have known about it at any one time, other than the thousands of permanent residents. That handful, when rationing began and all power sources became public property, simply and quietly withdrew from the world and severed connections with it. A little ruthlessness may have been necessary, but I prefer to believe that the worst to happen was a little forced change of address.

At any rate, there was suddenly a new nation with a population of about fifteen thousand at the bottom of the Pacific. It was well supplied with manufacturing and synthesizing plants, and oversupplied with energy. Fifteen thousand people. As Marie put it later, fifteen thousand aristocrats -and more than fifteen billion Jacquerie.



More realistically, fifteen thousand cut flowers.

Most of the accounts I read expressed, or at least hinted, the belief that the severance of relations with the surface hadn't been meant to be so complete. It must have been obvious to all concerned that a population of that size was far too small to maintain a highly technical culture and equally obvious that only a highly technical culture could live under those conditions. They presumably meant to maintain intellectual contact with the rest of mankind -probably they even meant to maintain physical connection, since it's hard to believe that they expected to be able to manufacture every piece of equipment they needed to keep themselves going.

But they didn't maintain those contacts. They couldn't. They might possibly have managed, even in the face of the unexpected difficulty, if what contact there was didn't have to be surreptitious; but the two factors together broke the link.

The unexpected difficulty might have been foreseen if the station had been running for more than a very few years before the break; there would have been some eye-opening experience. As it was, the experience came later.

A technical culture has to be a literate one, at least until some adequate substitute for the reference book can be devised. Did you ever consider the problem of teaching a phonetic language like Russian or English to someone who had never heard a spoken word and can't produce a sound himself?

All right, I know it can be done by a highly trained specialist. What do you do, though, for the specialists needed when no one in the entire population can speak a word and you want to teach the new generation to read Farrington Daniel's *Mathematical Preparation for Physical Chemistry* or some similar basic work? You're not qualified yourself. All your neighbors are in the same boat. The kids themselves are playing around together, presumably communicating by signs of some sort, but what are the chances of the signs they've invented for themselves being useful for explaining elementary vector analysis? Even elementary discipline questions are hard enough to get across; in this medium it's impossible to administer a decent spanking.

Still, you've got to produce a certain number of competent engineers and technicians with each generation, or the whole group is going to die in the darkness- and chill of the ocean bottom.

What *you'd* do I don't know, but this group leaned heavily on pictures. I don't know the details. There were differing versions in the books I read, and I suspect that many of them were guesses on the part of the writers. There must have been a lot of determination, some panic, a high general intelligence level and a certain amount of plain luck involved. As it came out in the end, the grandchildren of the original group had the use of a highly workable written language which must have evolved, just as I'd suspected when I saw it, from electrical and engineering diagrams — the sort of things where the connection between symbol and experience could be most easily shown to the growing children. The gesture language was a derivative of the written one, with gesture patterns standing for drawn symbols in much the way that our phonetic written languages are derivatives of the spoken equivalents. Think over the details yourself; I'm still incompetent.

What I could see was that children who had never heard a spoken word and had grown up using a language which is basically pictorial, with a backup code of gesture symbols, are going to have quite a time learning a language which is basically oral, with a backup code of written phonetic symbols.

I don't say it will be impossible for them. An intelligent and determined person can accomplish remarkable things. I do say that very, very few of them are going to consider it worth much effort. The majority, however intelligent, are unlikely to be determined.

Of the few that will make the effort, none will have much confidence in their own skill, because they will never have had a chance to check it except on each other. They'll be like a social club which has decided to learn Sanskrit as a project and" has only books to learn from. There'll be some uncertainty even in matching an engineering text with the machinery it's supposed to describe. Given the choice between using the original maintenance manual, printed in chicken tracks which really stand for sounds they've never heard, and using the notes made for their convenience by the maintenance workers who already know the machines -which are the kids going to do for homework?

Of course, the original books are still available as the years go on. They certainly aren't getting worn out. Unfortunately, as the years go on the original books become less and less useful. They need modern texts, in one sense; but there are two strikes against the modern text.

First and obviously, they can't read it. Second, it's about as directly useful on machines designed and built a century or so ago as the manual on a power lathe would be to a flint-ax maker of thirty thousand B.C.

The machines designed and built so long ago have lasted well, but not perfectly. Routine maintenance must, more and more often, give way to major repair and even replacement; the original books don't cover these problems even if they could be read. The notes of the maintenance engineers certainly don't cover them.



So these people need helpers from the surface, either engineers who can do the necessary work without following a manual, or else harder-to-define experts who can take modern books and transfer their meaning to the local maintenance specialists. Maybe schoolteachers would be the best term.

In other words, they need Joey, and Bert, and Marie, and me. They need practically anyone they can recruit from the surface. *Need* us. Marie's hypothesis was perfectly right. They've been getting people like us for decades past - the people whose writings enabled me to figure all this out -and their survival depends on keeping it up.

But that gave food for another thought.

It was easy enough to believe that a certain percentage of the people who had come to this place, either accidentally or as a result of surreptitious recruiting, had been persuaded to stay of their own free will. It was much harder to believe that all of them had been. What had happened to those who had not agreed?

I could see two possibilities. One was the fate which Marie seemed to expect if she tried to leave. The other was the explanation Bert had offered, that they had been allowed to return to the surface unharmed but that the Board had covered up their stories or reports.

But Bert was a proven and admitted liar. He might also be wrong.

There were references in the books I had read to visitors who had arrived, but of whom nothing more was mentioned. Of course if they hadn't stayed it was unlikely that anything would be - either way. I didn't like to believe that violence had been used - I preferred to believe that Bert was right. Still, Marie was far from stupid, and the morals of this isolated culture might well be those of a century or so back. In fact, in some ways they obviously were.

It was enough for me that there was even a possibility that Marie might be in danger.

For once, I was in complete agreement with Bert; she had to be persuaded to leave at once.

Furthermore, she should be guarded until she was well away from here. Guarded by me. That meant two jobs, of which the first was likely to be the harder. Marie had listened to Bert's arguments about her leaving for several weeks, with no result except a complete undermining of her trust in Bert. How could I possibly do any better?

I claim to be a reasonably good engineer, as I've said before, and I can run a competent investigation when the subject is an essentially technical one like tracking down where power is going. I'm not a plotter, though, in the real, old-style meaning of the term, and for a while I was completely stumped by this problem. I suppose what blocked me so long from a working idea was a natural reluctance to tell anything but the truth to Marie, backed up by an even greater dislike of causing her unhappiness.

I don't know what finally broke through that block. Suddenly, though, it seemed as clear as day that if Marie were bound and determined to stay as long as she believed that Joey might be alive down here, she would presumably go if she were to be convinced that he had died down here.

I didn't like the idea. I don't like lying, especially to people who trust me and most especially to Marie. I went through the usual stage in childhood where lying seemed the easiest way out of all troubles, but some very good teachers and a pair of understanding parents, assisted by a close friend with a good right cross who outweighed me by fifteen pounds, had helped me outgrow it. In the present case, I had to tell myself repeatedly that it was for Marie's own safety before I could decide it was proper to do.

How I convinced myself that it would also be worth the unhappiness it was certain to cause her is something I choose not to discuss. Once I *was* convinced, the plan was so simple that I wondered why Bert had never thought of it. After all, he seemed to lack my prejudice against falsehood.

Chapter Nineteen

I suggested it to him at the first opportunity, and he couldn't see why he hadn't thought of it either. He approved strongly, and complimented me as eloquently as developing writer's cramp would permit. Then he set to work on arrangements.

The plan was simple enough. Joey's sub was still here, of course. We would simply wreck it, tell Marie we had found the remains, and if necessary show them to her. A little care would make sure that the registry number and enough other identification features remained recognizable. With that much agreed, we set out for the dock where the boat lay. We'd have been able to get to work the moment we reached it, except for the fact that the half-hour swim without communication had enabled each of us to work out all the details. When we resumed conversation, the details didn't jibe, and it took half an hour or so to reconcile them. With that, actual work and Bert's search for people to help us with transportation, more than six hours passed before we were really ready to move the sub outside.



We didn't attempt to run it out under its own power, though that would have been possible. It had been allowed to fill with the living-liquid at local pressure after Joey had been converted. We were able to work on its inner plumbing with no trouble. We thought of bringing it back to the 'operating room' and connecting it with the transfer lock so that we could pump room and sub back down to surface pressure, but an easier plan had occurred to me.

Like all deep-work machines, Joey's vessel had very large lift and ballast tanks. The former still worked, not having leaked enough flotation liquid to matter, judging by the sub's present buoyancy. The latter, of course, were now full of the liquid which formed our regular environment. They were in two major units extending nearly the full length of the hull parallel to the keel, with each unit divided into four cells by bulkheads containing valves and transfer pumps.

We opened all these valves. Then we cracked the seals on the maintenance ports without opening them completely, so that fluid could bleed between the main hull interior and the ballast tanks. The ballast scavenger pumps would now, given time, empty the hull as well as the tanks.

Finally, we arranged for the collapse of the hull. I had taken for granted that we could use ordinary explosive squibs, forgetting how sound affected a person living in liquid. The things simply weren't to be had; they were never used here.

We finally settled the problem - we thought - by opening all the interhull inspection plates and removing as many of the bolted braces - the ones which had to be removable for maintenance purposes — as possible. It seemed pretty certain that pumping out the hull now could hardly help but cause it to collapse.

A good deal of time was wasted trying to improvise something that would start the ballast pumps either by time or from outside. It finally occurred to someone - not me - that there was nothing to prevent us from starting them from inside and then leaving, shutting the lock after us. Pressure would not start to drop until the hull was sealed off from the ocean.

That seemed to finish the job. The sub was already weighted in near-equilibrium with outside ballast, so we picked it up and began to swim toward the nearest entrance. There were ten of us altogether, and the load wasn't too bad. We brought it to a halt under the roof opening, pushed it up until it met the interface and left it there while we donned outdoor coveralls.

I wasn't yet accustomed to these. I hadn't yet gotten around to asking what the little tank on the back was for — my theory didn't account for it, as you may remember. There was no chance to ask now. Bert helped me to adjust everything properly, though I wasn't sure what he was doing part of the time. In three or four minutes we were casting off the outside ballast, and the sub was entering water for the last time.

We left a little negative buoyancy on her, and some of us walked supporting the hull while the rest swam and pushed it. Bert and I hadn't made any special plans about where the wreck should be staged; obviously it shouldn't be too close to an entrance, or there'd be little excuse for not having found it sooner. On the other hand, it wouldn't be possible to carry the thing too far away. We gave it an hour of travel and then let the hulk settle to the bottom.

Personally, I couldn't have found my way back to the entrance we had used, and it would have been sheer luck if I ran into one. Bert and the others didn't seem worried, however. I assumed that they either knew the ground or had some navigation scheme I hadn't yet learned about. The only light came from our own lamps, whose radiance formed a tiny glowing dome in the immense blackness of the Pacific. We were far out of sight of the tent area, as I still called the farm region in my own mind. I didn't even know the direction in which that lay, and knowing would have done no good since I had no compass. Bert gestured me toward the sub's lock. I opened it and went in. In a way, I hated to do this, but the idea still seemed good.

What I had to do inside was done quickly; it amounted only to closing two switches. I closed the locks behind me and joined the others.

We had recharged the boat's batteries, and there was no worry about there being energy enough to empty her. I was quite proud of remembering that point - large as the tanks were, adding the hull volume to them meant a tremendous additional job for the pumps. However, I had barely reached the rest of the group when we were reminded of something neither Bert nor I had thought of, and for which there was not the slightest excuse for either of us.

Emptying the ballast tanks with the flotation tanks still full put positive lift on the boat. Naturally, she started up.

Fortunately the initial rise wasn't too quick. I was able to catch her, open the lock under power - I couldn't have done it manually with pressure difference already set up - and unseal and open the lift-jettison valves. By the time I got outside again the ship was a couple of hundred feet from the bottom. The swimmers were flocked around covering the scene with their lights: I looked at the top of the hull and saw the oily stream of lift fluid pouring out. The rate of climb was already slowing, and in a minute



or two it ceased and reversed. We followed the ship back to a place on the bottom not too far from the one we had picked. And there we waited. And waited. And waited. The helpers talked finger-language among themselves. Bert and I couldn't talk at all, since the pad had been left back at the entrance when we had donned the coveralls. We each knew just about what the other was thinking, though, and as time went by and the hull just lay there we began to exchange inquiring glances.

The pumps had had time to handle the total volume by now, certainly. The inside of that ship should be practically a vacuum.

We had paid no attention to what was left in her air tanks. There couldn't have been enough to matter at this pressure. No bubbles had appeared from the ballast vents, but any air released by the tanks inside might well have gone into solution at this pressure before being ejected.

The problem was not whether the inside pressure was zero or some small number of atmospheres, though; it was what we could possibly do about the hull's failure to collapse. The pressure would stay down until long after the pumps ran out of fuel, and even that would be a long time since they must now be running free. Considering the general reliability of Board equipment, it could be months before some tiny leak let the internal pressure build up again to the point where even power could open the locks. I didn't know how long we could sit around without more oxygen-food, but it certainly wasn't months. As a matter of fact, it was going to be fairly hard to explain the three days or so which had already passed since I had seen Marie. Any more would be much harder, but I couldn't afford to see her again without a convincing story about Joey all ready.

A depth charge would have been helpful. Even a squib would probably have been enough; the hull, after what we had done to it, must be very, very close to its limit. Unfortunately, there were still no explosives available.

All I could think of was to take the sub back, have Bert or me go into the conversion room, attach the sub to the lock which was supposed to connect the room with just such visitors, go through whatever had to be done to get the man back to surface pressure and pump the room back down so he could get into the sub to start everything over. I didn't like the idea. I was pretty sure Bert wouldn't either, but I couldn't find out under the circumstances. It wasn't the sort of idea which could be transmitted by any gestures I knew. It was going to take quite long enough with the writing pad.

I did manage to make Bert understand that we would have to go back for the pad and a conference. When I tried to indicate that the sub should be brought with us, though, he vetoed the suggestion flatly. After a minute or two I stopped trying to push the idea. As I said, I wasn't too fond of the basic plan anyway.

He made some gestures to the others, and all but four came with us; the four settled down on a level patch of mud twenty yards from the ship and started a game of some sort. At any other time I'd have been curious about the details.

The swim back was, of course, much quicker than the one out - or rather, would have been if we had made it.

I don't know how far we got in the eight or ten minutes we were swimming. I suppose a quarter of a mile is a reasonable guess. I'm not the world's most efficient swimmer, and even I wasn't overworking. The interruption, like so much else which had gone wrong with our plans, should have been foreseen, but none of us had foreseen it. If we had, we wouldn't have been waiting anywhere around the sub after her ballast pumps had started.

It was obvious enough in nature, and the only reason I didn't realize what had happened in the first second after the event was, of course, that I wasn't really conscious.

Chapter Twenty

If you submerge yourself in water and have a friend knock a couple of large rocks together repeatedly, starting twenty or thirty yards away and coming closer until you can't stand it anymore, you may have some idea of what happened.

I can't describe how it felt. In fact, since it knocked me unconscious for several seconds, it isn't right to say that I felt anything. There was sensation of a sort, though; perhaps if I were sure just what it feels like to be hit with a sledgehammer simultaneously on every square inch of my body I might use that as an illustration. As it is, I'll have to let you use your own imagination, aided if you like by the experiment I suggested a moment ago.

The shock affected all of us about equally. It was a minute, perhaps more, before we were swimming as fast as we could back toward the place we had left the others. None of us had any doubt about what had



happened; none of us was really eager to go back to the scene.

But we hurried.

I had expected to find four bodies in the mud where our companions had been enjoying their game, but it wasn't that simple. The wreckage of the sub was about where it had been, as far as I could tell. But the shock wave as the hull imploded had kicked up a cloud of ooze which was still settling, and our lights showed us very little. We stayed close together and swam through the obscurity in all directions, searching every square foot of bottom not only for obvious fragments but for signs of objects buried under recently settled mud. That took no communication to arrange.

We found one of the men partly buried about fifteen feet from the nearest part of the wreck. He seemed intact as far as gross injuries were concerned, but I knew he couldn't possibly be alive. The shock wave had knocked us out at several hundred yards, and the inverse square law applies under water, too.

We could find none of the others on the bottom, but as the mud settled another of them became visible about twenty feet up, rising very slowly. A thin trail of oily droplets was leaking from the base of his helmet. I hadn't stopped to think that with the dense liquid filling them, the suits must also have flotation material to let the wearers swim in water. With the heavier liquid leaking out, the fellow's buoyancy was going positive.

That made it fairly obvious why we couldn't find the other two. They had probably sprung faster leaks. I could imagine them somewhere above us in the dark, ballooning toward the surface with the last of the liquid that had made their strange lives possible dribbling back toward the sea bottom. I thought of looking for a rain of oily drops which might let us track them, but I had no way of communicating the suggestion to the others, and it was pretty obvious that our lights were far too weak for such a search anyway. The rest of the group had the same general idea, evidently. With the two bodies in tow, we headed back toward the entrance.

I wish there were enough light to read the facial expressions of our companions. I would have liked to be able to guess how they felt about the foreigners whose operations had killed four of their friends. I didn't know what reason Bert had given for the whole procedure; maybe they thought it was an important piece of engineering research, or something like that. I hoped so. It was bad enough feeling guilty myself, without having the rest of the population down on me too.

I also wished I knew how Bert felt. The victims might have been close friends of his, for all I knew. I thought I might get some idea when we reached the entrance, but I was disappointed. There was plenty of excitement when we came in, but I simply couldn't tell what most of the facial expressions meant.

I hadn't realized how conventional such expressions actually are; unless you've grown up in a society where there is a standard face mask for anger, and another for disgust, and so on, reading faces isn't a very safe way to collect information. The people might have been angry, sad, or disgusted; I couldn't tell. There was much gesturing among them as the bodies were taken away, and a certain amount between some of them and Bert, but all I can say about their feeling toward us comes from the fact that we weren't mobbed. I couldn't even be sure that that situation would last; maybe no close friends or relatives of the victims happened to be present.

Activity around the entrance took half an hour or so to die down to normal. The bodies were finally gone, the men who had been with us had swum off about their own affairs and the swimmers one always seemed to see around any of the entrances were paying no more attention to us than usual. For some of them, that was a good deal; the girl who had gone down to the power section with us was back with her friends.

Bert was finally able to use the writing pad again. There was a lot I would have said - I was still feeling shaken, and guilty, and a lot of other things of which stupid was the kindest - but the same old communication trouble blocked me. There are some times when a man just can't talk fast enough, and a lot of times when he can't come even close to writing fast enough.

I rather expected Bert to say something about what had happened, since I was sure enough of *his* facial expressions to know that he'd been hit pretty hard too. But his writing was confined strictly to business. 'That should convince Marie, if anything will. The best thing will be for you to go to her now, tell her Joey's sub has been found wrecked and try to persuade her to take her own boat out to see it. Then she may be willing just to keep on going. If she won't believe you and insists on staying put, we'll have to bring the wreck in. That'll *have* to work. I don't know what we'll do if it doesn't.'

'You could stop feeding her.'

He looked at me and raised one eyebrow.

'Could you?' he scrawled. I shrugged my shoulders, but knew I couldn't.

'Lead on,' I wrote. He led.

The speechless pauses while I was going from one place to another would have given me all sorts of opportunity to think, and maybe even to see holes in the fabric I'd been so busy weaving, if I were only



another hundred percent or so quicker on the uptake. As it was, the next twenty minutes of swimming brought me no ideas at all except details of what to say to Marie.

None of these represented first-class plotting. I was still very uneasy as I swam up to her sub - Bert had stayed out of sight, as before - and tapped on the hull. Fortunately, that attitude fitted perfectly with the act I was supposed to play.

Marie answered almost at once, and her face appeared at the conning port. It was nice to see another set of features on which the expression could be read, even though the expression wasn't all I would have liked just at first. It softened a little when she recognized me, though. As before, I couldn't be sure of her vocal intonations, but the words came through understandably enough. 'Where have you been? I was beginning to think they'd disposed of you, too.' I answered the important part of the remark on the pad.

'Finding things out.'

'From Bert?'

'No. They have a library here, much of it handwritten stuff' by other people who have come down here in the past - and much too much of it for Bert to have written himself. The writings are pretty consistent, and I think I have a fairly sound picture of the whole situation.'

'What did you learn about Joey?'

I hesitated. I had been sure the question would come early, and I had my lie all made up, but telling a lie to Marie came hard. I told myself again that it was in a good cause and started to write, but she had already caught my hesitation, or maybe the expression that went with it - I've never claimed to be an actor.

'You *have* heard about him, haven't you?' I nodded.

'And he's - he's -'

She fell silent, watching me through the armor glass. I nodded to that, too. It was easier than writing an out-and-out falsehood.

I couldn't see anything but her face, but I could imagine the clenched fists. In fact, I had to wince as what was probably one of them struck the inside of the hull and sent a painful sound wave pulsing out into the room. Her voice came again.

'I was right. He wouldn't sell out. He wouldn't give up everything a decent person believes in, so they killed him.'

'Why should they destroy him that way?' I countered. 'It could have been done much more easily while he was inside, as he must have been when they were talking to him if you're right. They could have let him suffocate or starve -which they haven't done to you, remember — when his supplies ran out. They wouldn't have wasted the sub that way, either.'

'Simple. Because they wanted the death to occur outside, with him in the sub, so that when a search was made it would appear a regular accident. I'm surprised you didn't think of that.' At least she didn't say *'even you'*.

I'm slower-witted than Marie and know it perfectly well, but I *had* thought of that, as well as an answer for it.

'Don't be silly. Who'd be surprised, or even suspicious, at finding nothing when they did search for him? The Pacific has a lot of square miles at its bottom, and even more cubic ones on the way down.'

For a wonder, she had no answer to that, and was silent for several seconds. When she did speak again, she had dropped the subject of Joey for the moment and asked me to tell her what I had learned from the library.

Chapter Twenty-one

It took a long time, but I did my best. She read each page with care, sometimes nodding silently, sometimes asking questions after finishing it. I answered them all as my knowledge permitted.

About half her questions had to do with how heavily I had depended on Bert for my information. It must have been over an hour before I had painted about the same general picture for her that I had formed myself.

I closed with the plea that was the key to the whole plan.

'Marie, you've got to get back and report all this. Whatever Bert may have said about your staying, the Board has got to know everything. Bert and I will get back on our own when we can, and you don't have to consider Joey anymore.'

'Bert? Why should he want to go back? I know he's staying. He admitted it. He's had a taste of doing



what he wants, without having to consider other people. He tried to talk me into doing the same, the dirty beast. The fact that he's staying here is the only thing that makes me willing to listen to your suggestion that I go.'

'I don't believe that of him,' I wrote. 'He told me he was staying, too, but implied that it wasn't permanently. My feeling then was that he'd joined to find out what we need to know and would come back when and if he could, just as I did.'

'I can believe it of *you*.' She fell silent again and thought for several minutes while I listened to my own heartbeat. It was the most encouraging thing she'd ever said to me, and I felt worse than ever about the lie. I had to tell myself several times more that it was for her own safety.

Her own safety wasn't Marie's concern, however. She made that clear enough in the next few minutes. When she finally did speak again, it was clear that she'd been doing some rapid planning.

'All right,' she said. 'I'll go, though I still don't think they'll let me get away. There'll be some sort of accident. I've an idea, though, which just might tell which of us is right about this.'

I looked at her inquiringly, but didn't bother to write anything.

'You seem to believe that they're willing for me to go back and report to the Board, and that the change that's been made in you and Bert can be reversed so that you can come back and breathe air again when you want to. Right?' I nodded. 'All right. I don't believe either of those items. To find out, you just swim off and tell Bert that I'll go back if he'll come with me, in this sub. He can come back down afterward again if he likes, but I'll be much more convinced of his yarn if I see him breathing air again, and I'll feel a lot safer if he's in this boat with me when I drive it out of here. Now tell me why you think that's a silly idea and a waste of time and effort, and all that sort of nonsense.'

I didn't need air-normal sound transmission to know there was sarcasm in her tone; I couldn't hear it, but it was certainly there. She didn't trust me entirely, either. At least I could get some satisfaction out of surprising her with my answer.

'It seems like a fine idea to me,' I wrote. 'I'll find Bert and put it up to him. I suppose you wouldn't accept me as a substitute if he prefers to stay a while longer.'

Her expression changed a little, but I wasn't quite sure what the new one meant.

'Fraid not,' she said. 'It would prove your point about the return possibility, but I don't think you'd make as good a hostage.' That was some comfort, anyway. 'We'll play it my way, as far as it goes. Go find Bert and learn what he says.'

I swam off obediently. Bert was waiting in the entrance chamber this time, apparently improving his knowledge of the finger language with the assistance of our same old followers, the girl and her friends - two of them, anyway. I couldn't have told which was the missing one.

I had boiled everything down to one sentence on the pad and showed this to him the moment I was close enough.

'Marie says she'll go if you'll change back and go with her.'

He stared at it for a full half minute without even moving to take it from my hand. Then he suddenly snatched it and, without clearing the writing swam off down the tunnel toward the sub. The rest of us followed. He streaked over to the conning port where her face was still visible and held up the pad with my words still on it. She looked at it. He pointed at me and back at the pad and put on an expression which anyone, regardless of cultural background, could have read. She answered aloud.

'That's it, Bert.' He cleared the page, looking at her in a puzzled fashion.

'Why?' he wrote.

'I may explain later. Will you come?'

His answer startled Marie. I wasn't sure what it did to me.

'Sure. I may have to come back later - there's useful work to do down here. But it might be best if I went with you now anyway. There's a lot to be reported that there hasn't been time for either of us to tell you.' I thought that was a pretty tactful way of passing off her refusal to listen to him all those weeks. 'I could make a more thorough job of it.' He paused in thought, even longer than it took Marie to read the sentences. Then he went on, 'We'll tow your sub to the operating room - it'll be easier that way than for you to pilot it - and connect it to the lock. I'll go in and get de-pressurized. They won't argue too hard. I can come in through your lock then, and we can go back up together.' He turned to me and added the word, 'Okay?'

I wasn't sure it was okay. Without Bert I wouldn't be able to do anything useful, as far as I could see.

No doubt the girl who was still watching us, and her friends, might be willing to keep me from starving until I learned my way around. They might even guide me back to where I could work with Joey, if that was to be my main occupation; but I couldn't see what use I'd be to the Board that way. I hope it's been obvious that I never intended my residence to be permanent, as Joey apparently had. I hadn't been lying to Marie about *that*.

There was no use suggesting that I go back with the two of them. The sub wouldn't take us. It was built



for one, and crowding Bert in would be hard enough.

Then I remembered that Bert's own sub should still be around somewhere. I grabbed the pad.

'Why can't we all go back?' I wrote. 'Your boat must still be here, too. If Marie feels so strongly about having you in hers, I could still use yours. You can still come down again, or both of us can, if the job seems to call for it.'

It seemed like a fine idea to me, and even Marie appeared to approve of it, but Bert had a question or two. I had to admit he raised good points.

'The operating room will handle only one at a time. Once I'm done, there'll be communication trouble during your own depressurization.'

'You could explain the whole program to them first. For that matter, I could go through it first.'

'I'm not sure I could explain it too well. Remember, I'm no expert in this finger-wiggling.'

'But why couldn't I go first, with you directing which sub was to be connected, and so on, until it was your turn?'

'You could, I suppose. We'd better check my boat, though. It's been here a long time and been used for regular work here. The flotation system will certainly need going over. I'm not sure I'd like to risk it against pressure differential myself, but we'll see. We'd better check that first.'

Marie had been reading our conversation and nodded approval, so our flock went off to look over the vessel.

He was right. The flotation liquid was completely gone. It hadn't been used even locally for months, since there were no facilities for making the hydrocarbon its buoyancy tanks were designed to use. The local machines used the same sort of low-density solid employed in the swimming coveralls; it would have involved major structural changes to put that into the submarine. No one had considered it worth the trouble.

'I could use one of the local boats,' I suggested when this became clear.

'Don't try it until you learn the language,' was the rejoinder. That seemed a little silly. A sub is a sub, and you either understand them or you don't. A look into one of them educated me, though.

I still don't see why their control panels are made that way; the laws of physics are the same down here as up above. Apparently the difference in basic thinking which goes with that weird graphic language extends into more factors than mere common sense would lead anyone to expect.

It began to look as though the other two were going back alone. Bert seemed quite resigned to it, and even I was getting that way. When we went back to Marie with the word, though, she came up with another of her ideas. I've come to suspect since then that she had something more in her mind than just getting me back to the surface, just as she had when she insisted on Bert's going along, but she didn't confide in me. Of course, that may have been because there was no way for her to speak to me alone.

'There's plenty of spare buoyancy in my tanks,' she pointed out suddenly and firmly. 'Just attach that wreck of Bert's to my tow-lugs, and we can haul it along. You say the hull's sound enough to hold against the pressure when you pump it down again.'

Bert seemed startled, no doubt because he hadn't thought of that himself. That was my suspicion, anyway. But he promptly agreed; and so it was settled. He went off to get help in towing the subs and to arrange for the operating room, and I took advantage of his absence to write a remark to Marie.

'You seem to have been wrong about Bert. He certainly took you up fast enough on that test suggestion.'

'So I noticed.'

I waited for further comment, but got none. I suppose I should have known better than to expect any.

When she did speak again, it was on a wholly different subject - I thought.

'Be sure you check the bits on both subs very carefully.'

I nodded, surprised; that was too standard a procedure to call for special comment.

'And the lines, too. You'll use mine; they're newer.' I agreed silently, wondering and perhaps hoping a bit. Anything from Marie that sounded like interest in my welfare was enough to make me hope. I was still several miles behind her reasoning, only partly because I hadn't started out with the same set of prejudices. She wanted it that way, I guess; She firmly changed the subject by asking about the people who were floating beside me.

'Who are your friends? Is the lady one of the reasons you decided to stop breathing air?'

'No!' I wrote emphatically. 'I never saw her to my knowledge before I made the change.' I couldn't understand why Marie was laughing. 'I can't introduce you, because I've never heard their names. With this language, I'm not sure what a personal name would be like. Maybe they haven't any.'

She grinned for the first time since I'd seen her down here.

'That accounts for your staying, then. No, don't bother to point out that you didn't know about the language till afterward. I know you didn't. It must be a strong recommendation for the place, though, now that you do know about it.'



As it happened, I hadn't thought of that. She was quite right, though. That was one nuisance of my life which couldn't possibly follow me down here. Marie was watching my expression and, I guess, reading it like a book. She laughed even louder than before. The sound wasn't much like laughter under the circumstances, but it was different enough from ordinary speech to catch the attention of my attendants. They looked from me to the sub and back, but could make nothing of it. The girl smiled again though. Marie was right, in a way. If I did have to stay down here for any reason — I killed that thought firmly. Where Marie went, I was going sooner or later.

Chapter Twenty-two

The party grew almost gay for a while as we waited for Bert. Both Marie and I tried more communication experiments with the girl and her friends, but only the most elementary signs made sense to them, and not always even these. We even tried to get the idea of a phonetic alphabet across, Marie providing the sounds and I the symbols. But it was hopeless.

This wasn't entirely due to their own background deficiencies; sounds were modified enough in this combination of media so that basic letters no longer abstracted the same parts. For example, 'p' and 'V' didn't sound as different as they should, and when you put them together in a word like 'speak' the combination of symbols had even less resemblance, or I should say recognizable relation, to the combination of sounds. About all that was accomplished before Bert came back was to convince even Marie that there was a genuine, serious problem in communication to be solved.

She wasn't even yet convinced that it was worth solving. She was willing now to think of these people as a whole separate culture rather than a group of criminal fugitives from our own, but she still thought of the culture rather as a dignified lady of mid-nineteenth century Boston probably regarded the South Sea cannibals her missionary society had told her about.

At least, she was polite to them.

The politeness faded a trifle when Bert came back with bad news. The Council, it seemed, would hear nothing of letting both Bert and me go back to the surface at the same time. Either one was all right, but not both.

I was dumbfounded and unable to fit this into my picture of the situation. Marie didn't actually say 'I told you so,' but the look she gave me carried the thought completely. It was unfair, since she hadn't. She might have guessed it for herself, but she hadn't told me.

Maybe it was that look that stiffened me up again. I reminded myself that the main thing was to get Marie back to the surface safe and sound. After she'd reported in, the Board would certainly open communication with this place, no matter what Bert thought, and there'd be all sorts of other chances to get back myself.

I still, you must remember, didn't believe Bert's claim that the Board had ignored or buried earlier reports of this installation. My feeling was based mostly on my personal prejudices as a long-time Board official; I just couldn't imagine the organization's doing such a thing.

So it still seemed sensible for me to let the other two go back together while I stayed on temporarily. I said so, without all the background thoughts, on the pad. Bert agreed at once.

Marie seemed a little less enthusiastic now, but finally decided that this was acceptable. Bert suggested that he go off once more to report the new situation to the Council and find help for towing the sub, but she countered with the idea that she drive it herself with one of the natives swimming ahead as a guide. Bert could tell the guide where she was supposed to go.

I was a little surprised that she was willing to take the boat anywhere without Bert along, in view of her stated plan, but I realized that she might have thought of several new aspects of the matter since then. I hoped she might want me to go with her to the conversion lock instead, but she made no mention of such a thought. Once again I felt way outside as far as her plans and ideas were concerned. We waited until Bert had finished waving at one of the men, which took quite a while. Then the fellow set off along the main corridor outside the room, and Marie lifted her boat from the floor and followed in his wake - that's not a very good word, since he couldn't leave a visible wake under the circumstances, but you know what I mean.

Then Bert started off to make his arrangements with the Council.

He had almost disappeared when I thought of something and had to hurry after him. Fortunately he wasn't being very hasty himself or I'd never have caught him; it was a major nuisance, having no way to call out to get someone's attention. It occurred to me that there ought to be clickers or tappers or something of that sort for the purpose. It then occurred to me that maybe there were, and I simply



hadn't learned about them yet. Anyway, I did catch Bert and quickly wrote a question. 'Shouldn't someone let Joey know where you're going? He's going to be in almost as bad a mess as I am without you.'

Bert thought for a moment, and nodded.

'Probably best, yes. You'd better do it while I see the Council. Only for Pete's sake don't let it slip that Marie is here.' I looked properly indignant. 'I'll have one of these folks show you the way. He ought to be off shift right now, though he often stays longer than anyone expects. Anyway, you can try his quarters, and then the farms, before going back to Power Control.' He turned to the others and began gesturing again. He finally managed to get his wishes across, though it was still evident that he had spoken the truth about knowing only a little of the gesture-speech.

I wasn't disappointed to have the girl touch me on the arm and beckon me to follow. We still had company, but things could have been worse.

Bert must have got across with his gestures just about what he'd written. We went first to what was obviously a private residence — at least, it was obvious after we were inside. Its door was just another of many along one of the tunnels. The girl used the first audible signal I'd heard since arriving - a very ordinary, though very gentle, knock on a round panel beside the door.

When this went unanswered for half a minute or so she opened the door and swam in. Evidently standards of privacy were different here. The apartment was divided into three main rooms, seemingly on a basis of use; one seemed to be for sleeping, one for reading and similar solo activities and the largest for more public gatherings. Joey wasn't in any one of them, and the girl led us out again and off in a new direction. A short swim took us to another of the upward-slanting tunnels leading to the farm area. I was more alert this time and caught the change in slope.

Out in the open, she stopped and looked around to see whether Joey was in sight. I spent some of the time she was looking in trying to calculate the size of the farm area from what I knew of the population size and the number visible eating at one time. I decided I'd need a better estimate on how long the average citizen spent both at meals and between them before my results could mean much.

It took about five minutes of looking and questioning others for the girl to find Joey. I spent some of that interval writing my message to him, so that when we did catch up with him I was able to give it to him without delay. It merely said that Bert was taking a trip to the surface, and that I understood I was to start working with Joey as soon as he could use me.

Elfvén nodded his head, took the pad, wrote, 'All right, I'll be going back to work in a few hours. I have to sleep after I finish eating. Can you find your way to the control room yet?'

'I'm not sure, but I seem to have a good guide,' I replied. He glanced at the girl and nodded again.

'I wish I could make something out of one or the other of these communication methods,' he wrote.

'We're going to have an awful time without Bert. Why is he going himself, instead of sending you?'

'He seems to feel that he can make a more complete report than I can,' I answered. 'I suppose he's right. As long as we're working mostly with each other we won't miss the language too much.'

Joey shrugged, suggesting that he wasn't entirely in agreement but didn't feel strongly enough about the matter to write an argument. He resumed his eating.

I took a few mouthfuls myself, but was more concerned with getting back to Marie; so I touched the girl's shoulder — she was eating, too — and pointed toward the tunnel mouth from which we had come. I had managed to keep track of its direction. She nodded and led the way. At least *some* signs were understandable to both of us, I guessed.

It took us ten or fifteen minutes to get back to where we had left Marie. She wasn't there, of course; I got the impression that my guide had forgotten that the sub had left ahead of us, though I may be doing her an injustice. At any rate, she promptly set off in the direction the boat had gone, and in another quarter of an hour we had reached a place I could remember - the corridor with the big valve which had admitted my tank when I had taken the pressure treatment.

Knowing more of the general situation now, I paid more attention to the smaller lock. A close look showed that it had a heavily armored extensible collar, now retracted, which could be mated easily to the entrance hatch of any ordinary work sub.

I was a little surprised that Marie's boat wasn't already there. I think the girl was, too. At least, she looked around as though she didn't quite know what to do or where to go next, and then looked at me as though expecting some further request.

All I could do was nod; I was quite sure that this was the right place. It occurred to me that tunnel size might have forced the others to take a longer route than swimmers would need, or even to go outside, but I could think of no way to make this suggestion to my companions. For that matter, I could imagine no reason why they shouldn't think of it themselves; they certainly knew this place better than I.

It was Bert who showed up first, accompanied by a man of middle age and alert appearance. He didn't exactly introduce the fellow to me, but used the writing pad to tell me that he was the doctor who



would manage the heart-lung equipment and make sure that cavities such as sinuses and middle ears were taken care of during the pressure change.

They had been with us ten minutes or so when the sub appeared from the direction of the ocean entrance. At almost the same moment another swimmer joined us from the opposite direction. I took a casual glance at him, supposing he must be another of the technicians who would be needed for the job; then my eyes closed as I tried to clear my retinas of what I hoped was a false image.

When I opened them again, though, it was still Joey Elfven. I had to admit that the stage manager, whoever he was, had done a good job.

Chapter Twenty-three

I also had to admit that we should have foreseen it. Joey should never have been told of the departure plans until Marie and Bert were safely away.

Nothing was more likely than that he would think of some final questions he wanted to ask Bert, and he would certainly know where to meet him. Evidently Bert was no better a schemer than I was, but that was very little comfort at the moment.

Marie saw him before either Bert or I could think of anything to do; the sub suddenly left its swimming guide behind. Seconds later its water jets sent us spinning as it came to halt in front of our group. Yes, Marie had seen Joey. Her politeness with the savages had evaporated.

I had been hearing my own heartbeat and those of people near me for some time now, but I hadn't realized until this moment how loud that beat could be.

Marie's voice, though, turned out to be louder. Her first words weren't just the ones I would have expected, but I've already admitted that she thinks a good deal faster than I do. Not always in the same direction, or even in the right one, but faster.

'Joey!' It ought to have been a howl of surprised welcome, but even the peculiar acoustical situation left me pretty sure it wasn't. It's hard to believe that a girl known to have gone so completely overboard for someone could address him in the tone of a stern aunt, but the resemblance was there. 'Joey, how long have you known that I was here?'

Joey looked around for the writing pad; I was delighted to hand it to him and in no hurry to get it back. 'I didn't know until this moment,' he wrote.

'How long have you known that Bert was here?'

'A few weeks. I don't remember exactly. Within a day or two of the time I got here myself.'

I could guess what was coming next, but fortunately for me I was wrong.

Marie was not a technician. She can run a sub in the ordinary course of duty, naturally, but she is not really familiar with all the handling and operating gear carried by a work sub. For that reason, I'm still completely mystified how she managed to coordinate her next move so perfectly. One of the smaller handling tongs popped out of its recess and caught Bert neatly around the neck, and only when he was firmly gripped did she follow the action with words.

'You dirty liar! You slimy piece of trepang! I ought to twist the head off your crooked neck! If it were possible I'd throttle you here and now! You knew why I came and who I was looking for. You knew he was here. You didn't tell him I'd come, and you lied to me about having seen him. You twisted poor Tummy so that he followed your own crooked line!'

I somewhat resented the implication that I hadn't brains or initiative enough to be held responsible for my own actions, but I was able to resist the temptation to break in and insist that part of the plan was mine. I didn't even object to her use of one of my more odious nicknames. I just let her words run on.

I won't quote any more of them; as I've said already, I promised her not to. I was a little sorry for Bert, since the grip on his neck must be hurting, but as Marie herself had said she couldn't very well strangle him under the circumstances. I was sure she wouldn't if she could have. Not Marie. The others seemed rather concerned, though. The girl and her regular companion flung themselves at the extension arm and wrenched at it uselessly. The doctor tried with equal lack of success to pry the tongs from around Bert's neck. Joey knew better than to do either, but he was clearly bothered; he waved and shook his head at Marie in an effort to convince her that she should stop. It was the sort of scene which should have been accompanied by lively music, screams, the thump of fists, and the crash of broken glass; but it all went on in ghostly silence.

No screams, which were impossible; no fists, which couldn't move fast enough in this medium to make much of a thump anyway; no apparatus within reach which was fragile enough to be damaged by the gracefully thrashing bodies.



It was Joey who managed to bring it to an end. He was still holding the writing pad, and he hastily printed on it in the largest letters that would fit, 'YOU'RE KILLING HIM!'

He held this against the conning part so Marie could see practically nothing else.

It took a few more seconds, but she suddenly got her senses back and released the tongs. Bert's face was purplish, and he had lost consciousness; the doctor grabbed his wrist, I thought to check pulse, but in fact simply for a tow bar. The two of them disappeared into the operating room.

I hesitated for a few seconds, unsure what was most important, and then went after them. The girl and her friend followed me; Marie's guide stayed outside with the sub. Joey, after looking as though he would come along, changed his mind.

In the operating room Bert was quickly fastened to the table, and the doctor got to work.

Strictly speaking he wasn't a doctor, as even I realized; there can be no doctors in a population of a few thousand people which has been separated from the mainstream of human knowledge for three or four generations. He was a darned good technician, though, and fortunately was working right in his own field. He did know that heart-lung machine cold, and he knew the general run of troubles involving the human breathing and circulatory systems. Interfering with the coughing reflex, as these people had had to do for their pressure-survival system, had produced some fallout along those lines. There were controls for the machine and its auxiliary gear inside the room, presumably in parallel with the remote ones. Quite evidently depressurization wasn't the only purpose of the apparatus.

In something under sixty seconds the tech had Bert plugged into the gadget, and his color was coming back to normal. Then, in more leisurely fashion, other instruments began looking and prying down his throat.

Apparently very little real damage had been done there, though the outside of his neck was starting to discolor into one huge bruise. In less than five minutes the doc - I'm going to call him one, under the circumstances - withdrew his equipment and used a hypodermic on his patient's upper arm. The needle must have contained a stimulant, for Bert opened his eyes almost at once.

It took him only a few seconds to get oriented. Then he fixed his eyes on me and actually blushed. He was still a little confused, because he started to speak. The pain in his chest as he put pressure on his liquid-filled lungs brought him back to reality. He looked around and made writing motions. The doctor didn't seem to mind, so I went back for the writing pad, which Joey still had.

I didn't have to interrupt a conversation to take it. Joey wasn't writing, and Marie wasn't talking.

Apparently nothing at all had been said during the crisis in the operating room — we'd have heard Marie's voice even there, and Joey's three words of a few minutes before were still on the pad. Marie was looking at him through the port, and he was looking everywhere but at her. I didn't pause to do any analysis. I just took the pad from Joey and swam back to the table.

The doctor called Bert's attention to the blood connections between him and the machine, but made no real effort to stop him from writing. Bert nodded an acknowledgment of the warning and went ahead with the stylus. He wrote briefly, and handed the pad to me.

'I'm sorry, but I can see when I'm checkmated. I hope your luck is better, though now that she knows Joey is alive I wouldn't bet on it. Tell her she didn't kill me, if you think the possibility is bothering her. I'd better not see her again myself.'

That was an eye-opening paragraph. Suddenly I saw just why Bert had been trifling with the truth, why he had concealed Joey's presence from Marie, why he had decided to go back to the surface on such short notice, why he had been so far from completely frank with me - and even why the local Council had been so reluctant to let us both leave.

I also saw that I was in no position to criticize him for any of it. There was not a word to be said against him which didn't apply with equal force to me. The only reason I hadn't done as much, under exactly the same motivation, was that I'd been in no position to.

I couldn't blame him, or even criticize him. I have failings, but I'm not that much of a hypocrite. I could be sorry for him; as he'd said, his chances were gone.

Marie might conceivably come to realize that Joey was a hopeless case as far as she was concerned, even after this discovery that he was alive after all. She might possibly settle for me if that happened.

But after the last few weeks and the discoveries of the last few minutes she'd never, never have any use for Bert.

I gave him as sympathetic a look as I could as all this dawned on me, but I could think of nothing to write. He answered with a bitter grin and waved me toward the door. I went. The others, except the doctor, followed me.



Chapter Twenty-four

I wasn't through learning for the day, though. As I went through the huge valve and became visible from the tunnel outside, Marie's voice met me. It had sharp edges, but otherwise it resembled a heavy club.

'Just where did you come up with the idea that these people weren't getting oxygen through their lungs? If I killed Bert I'm not too sorry, but it's your fault.'

Even I had had time to see that this question would be coming, but I'd had no chance to work out a very good answer. While the doctor had been working on Bert I'd been doing the same with my memory. It was evident enough that my theory of oxygen-food was out the window, but I still wasn't able to find a better one.

All I could do was repeat the theory and my reasons for it. I also assured Marie that she hadn't actually killed Bert. Somehow my reasoning didn't look as airtight written out as it had felt when I was thinking it through in the first place - quite aside from the fact that it was now obviously wrong. In spite of this, Marie seemed to calm down as I wrote page after page, let her read each, and cleared it and went on to the next. The forced pauses may have helped.

I admit you convinced me before,' she said when I was done, 'and I don't see what the hole is myself. Joey, in the time you've been here have you found out enough to let you tell us what's wrong with this notion?'

'I think so,' he wrote. He paused, and positioned himself outside the port so that Marie could read as he wrote. I swam to a spot a little further above and behind him, so I could do the same.

'Your big mistake was natural. You were quite right in observing that we aren't breathing, as far as chest motions go. But in spite of that we *are* getting oxygen from this liquid. It's wonderful stuff. You might regard its molecular structure as vaguely comparable to hemoglobin in that it binds oxygen molecules loosely to its surface. I don't know just how many, but the number is large. It doesn't have the porphyrin groups of hemoglobin; they went to great lengths to make it transparent to visible light. I couldn't draw you its structural formula from memory. But I've seen it. It's perfectly understandable.

'Now, think a minute. Liquid oxygen has a molecular concentration about four thousand times that of the gas we normally breathe. The reason we have to breathe is that diffusion, at sea-level concentrations, won't get enough oxygen through your windpipe to keep an animal as large as a human being going. You can't live in liquid oxygen, of course, because of temperature problems. However, in this liquid the concentration of almost-free oxygen is far, far higher than in the atmosphere - a long way short of what it is in LOX, but very high. That was another problem; while they were at it, they made the kernel of this molecule with a structure which would break down endothermically at temperatures above a few hundred degrees. A fire will tend to damp itself out, therefore. But that's a side issue, as far as breathing is concerned.

'When molecules of the stuff give up their oxygen in your lungs, nearby molecules pass on more O₂ to the ones which have lost it; others replenish those, and so on. It's a bucket-brigade situation, but it's described by just the same equations that you'd use for a diffusion problem. The rate of oxygen transport depends on the concentration difference between the inside of your lungs and outside, and on the area of the barrier through which the diffusion is taking place — in this case, the smallest cross-section area of your windpipe. In this case, the oxygen concentration around us is enough to keep us going by diffusion down our windpipes. I'm not sure about carbon-dioxide elimination, but I believe your theory is more nearly right there; it's taken care of by binding into insoluble carbonates in the intestines and gotten rid of as solid waste. As I say, that seems a little funny to me, and I may have misunderstood what I read about it. I'm going to dig into the matter more when I have time. I'm no physiologist, but it's fascinating reading, especially the history of its development.'

'But why such a fancy arrangement? A less efficient oxygen carrier would still work as long as you pumped fresh supplies into your lungs! That's why we breathe, anyway!' Marie couldn't have been thinking at the top of her form just then; even I could see the answer. I took the pad from Joey - in fact, he held it out to me, with a suspicion of a grin on his face — and started my own exposition.

'Pumping a liquid even denser than water through your windpipe would call for tremendous effort and probably dangerously high lung pressures. I tried it just after I made the change, and I know it hurts. I wouldn't be surprised if you could rupture lung tissues that way. It's a logical chain: fill body cavities with liquid so that outside pressure can be matched without serious volume change; then you can't pump the liquid with your normal breathing equipment; so you have to give it a high enough free-oxygen concentration to diffuse an adequate supply down your throat. Simple once you see it. What's the primary source of oxygen, though, Joey?'



'Just what you'd expect. Photosynthesis. That's where most of the power produced here goes. About three-quarters of the oxygen comes from gene-tailored algae living at the interface between the ocean and the breathing liquid. The rest comes from the farm plants. Loss to the ocean is low because of the favorable partition ratio.'

I took the pad again.

'Well, at least I was right in guessing why laughing is dangerous, and why they do away with the coughing reflex; either action could rupture your lungs.'

'Of course,' agreed Joey. 'I don't claim to know the whole story yet — even Bert, who's been here much longer, probably doesn't. Remember, all we could learn about it was what we read, and that was only what happened to be lying around written in languages we knew. We weren't *told* any of it by these people. Not only is it impossible to talk to them on such a level; I'm pretty sure most of them don't know it either.'

How many people at the surface, out of any given fifteen thousand, would be doctors or physiologists or even engineers?'

'That's why they need us so badly,' I interjected. 'Bert must have told you about that.'

'Who'd believe Bert?' snapped Marie — we'd been holding all our writings so she could read them, of course, even when they weren't specifically meant for her. Joey took over the pad.

'You'd better. Whatever he said about these people being ready to do almost anything to keep technically skilled visitors down here is probably true. From what I've been able to make out in the last few weeks, unless some very extensive work is done on this installation quite soon, there'll be twelve or fifteen thousand people migrating back to the surface and asking for their power ration in the next couple of decades.'

'How could they have the gall to do that?' Marie asked in scorn. 'They've been down here all their lives, squandering power that should have gone into the world network and shared with the rest of us. They're just like those old French aristocrats with their "Let 'em eat cake" attitude - except the aristocrats would have been too proud to come begging the *Jacquerie* for crusts if their own wealth vanished.'

'That was my first reaction, too,' Joey wrote imperturbably. 'I got myself pressured for the same reason Bert and you' — he nodded to me — 'did; I planned to investigate as completely as possible and send up a report that would have the Board down here civilizing this place in a month. By the time I had enough data for a meaningful report, though, I realized it would be useless. The Board wouldn't do anything about it.'

'That's what Bert claimed,' I put in. 'He said that such reports had been sent back before, decades ago, and that nothing had come of them.'

Joey reclaimed the pad.

'I never ran into any accounts of that sort. Bert and I wouldn't have looked for just the same material, though, anyway. My point is that the Board can't do anything about it.'

'Why not? Look at all the energy going to waste down here!' interjected Marie.

'Think again, girl. It's not going to waste any more than the power used by natural plants on the surface for photosynthesis is going to waste - far less, in fact. It's true that you can divide the power output of this installation by the local population figure and come up with a figure many times the normal per capita energy ration; but by far the greater part of that power goes into the lights. If you cut any significant percentage of the lights, you drop the photosynthesis rate to a level where there won't be enough oxygen for the present population. If you cut the population by much, even the shaky maintenance that the outfit has now will degenerate, and, as I said, the place will have to shut down.'

'You may criticize the decision the ancestors of these people made three or four generations ago. I agreed it was highly immoral by our standards. However, the current population is simply stuck with the consequences, and at least they're not drawing from the planetary power net. They're on their own, except intellectually. It seems quite in line with duty, to me, to stay here and help them. You'll have to make your own choice.'

Marie was silent for half a minute or so, wrapped in thought. When she spoke again, it seemed to be a change of subject.

'Why did Bert lie to me? None of what you've been pointing out — which I can see makes sense — seems to call for it.'

Joey shrugged.

'I have no idea. Remember, he didn't tell me you were here, much less anything else connected with you. I don't know what he had on his mind.'

Joey's eyes and Marie's both swiveled toward me. After looking at my face for three or four seconds, the girl said, 'All right, you know. Out with it.'

I reached for the pad which Joey was holding out to me, and made it fairly brief.

'He lied to you for the same reason I did. He didn't care what you reported to the Board, but he didn't



want you ever

to learn that Joey was alive. He wanted to get you back to the surface believing that Joey was just a memory and go back with you. I'd have done the same.'

Joey took the pad after Marie had read it, cleared off the message and wrote, 'Thanks, Pal,' holding it so that I could see it but not Marie. Then he cleared it again immediately. If Marie noticed this, she made no comment. She may not have noticed, for my words had obviously jolted her.

I see,' she said after at least two minutes of silence. 'That puts a different light on the whole thing. He's less obvious than some people, I must admit.' She paused for a few more seconds. Then, 'Joey, I admit it's your own private business; but are you willing to tell me exactly and truthfully why you decided to stay down here?'

A negative shake of the head was the answer.

'Or how long you plan to stay?'

Another negative.

'Or even whether you still regard yourself as a Board official?'

Still refusal. I was pretty sure that Joey didn't really care whether Marie knew the answers to those questions, especially the first one; but, especially with the first one, he didn't want to tell her himself.

He was coming as close as his personality would let him to telling her to get out of his hair. Marie, as I have already said many times, is sharper than I am, in spite of one blind spot.

She looked at him speculatively after his third headshake, for several seconds. Then she suddenly turned to me.

'Are *you* staying?'

Naturally, I didn't know. All I could do was throw the question back at her; she might be rougher on me than Joey had been on her, but I was ready for it — I hoped.

'Are you?' I wrote.

'A shock wave, not quite painful, hit all of us; I don't know whether she hit something with her fist or stamped her foot.

'Will you make your own mind up, just this once?' she snapped.

That was unjust, of course. I'm perfectly able to make decisions, and Marie knows it. She's even admitted it. I just don't like to make them when there's a shortage of relevant information. She knew perfectly well what information I wanted, and why, too - she'd just been trying to get the same sort out of Joey for the same reason.

I made an honest effort to decide without reference to Marie, but I couldn't do it.

Chapter Twenty-five

On the surface there is sunlight and sound. I hadn't really appreciated either until recently. Sunlight on trees and lakes, blue sky, red and orange sunsets. Girls' voices and falling raindrops and laughter and puns.

Down here is the beating of hearts, humming machinery, tapping and thudding of random activity, but otherwise silence — no music, no voices, not even a tongue click or snapping fingers.

On the surface there is restraint. Every action is conditioned by the underlying awareness that it may involve a waste of energy which means life. If someone accidentally shorts a power cell or lets a fire start he feels as guilty as the Victorian-age girl who misbehaved with her boy friend. The fact that your wife is dying in a hospital five miles away is a borderline excuse for using a power vehicle. An air or space flight is considered only in direct connection with power acquisition or research projects.

Down here, while there is actually only a slightly larger supply of energy per person, the difference in attitude is all the world. No one is either worried or offended that his neighbor has used more than his fair share of energy. I had winced time after time there in the library as a reader had swum off leaving his carrel light or reading projector going, with no one else even noticing the lapse.

And why couldn't there be music here? I hadn't heard any, and singing was obviously impossible. But stringed instruments should work. They might have to be modified in design, but they *should* work.

Electrical ones would certainly be possible. If there weren't any, I could design them.

Even if there were no girls' voices, there were still girls.

There was a good-looking one only a few feet away, watching us as though she had some idea of what was going on.

But it was so different. Even with energy restraint gone as far as my neighbors were concerned, would I feel comfortable after a lifetime under its rules? Would the thought of the black, crushing ocean



between me and all I had grown up with loom too large? Or if I didn't stay, would the thought of what I might have accomplished down here come too often between me and normal living?

I couldn't decide. Even if I tried to cut out all personal factors - not just those connected with Marie, but all which by any stretch could be called selfish — I still couldn't.

There was my regular work with the Board. It was useful, even important, and I liked it. I could do useful work down here, though, and would almost certainly like it. Reward, to be selfish again, meant little in either place. Wealth as such has been meaningless since power rationing started, and down here I had seen no signs of plutocracy. Though admittedly I might have missed them; I know so little about the place.

Of course, I could learn more. Neither decision was irrevocable. The only thing that couldn't be changed back had already been done; my coughing reflex was gone, and I'd have to be careful in eating for the rest of my life no matter where I lived.

Maybe I could stay now, see more of what life here was like and go back up later on. After all, there was no reason why the two places couldn't stay in communication. I looked up and was about to write an answer for Marie when my thoughts started working again.

Would there be communication? Joey had pointed out excellent reasons why the Board would not want knowledge of this place to spread, though he hadn't stated them just that way.

Here was a place where power rationing, however real it might, be mathematically, simply wasn't a conscious factor in life. The population, as Marie had said, was like a group of French aristocrats in a world of *Jacquerie*. Ordinary morals up above called for a rigid attitude toward energy use which these people didn't have and probably couldn't understand.

If too many people from the surface visited here and the word about its way of life spread at all generally, there would be trouble. Even if the spreading word remained accurate, which was most unlikely, a lot of the outer world's people would either want to migrate down here or build more volcanic-power installations so that everyone could have more. The old 'why can't I have as much as he does' feeling would have people screaming for the modern equivalent of the philosopher's stone, to take an illustration from the days when wealth was metal instead of energy.

The average citizen would be able to see why the Board shouldn't do just that — build more power stations to take advantage of the inexhaustible heat inside the Earth. I hate to sound cynical, but I know that's one thing the Board would never do. They won't do anything to make power rationing unnecessary.

Cynicism aside, they're perfectly right. The decision decades ago that hydrogen fusion was man's only real hope was almost certainly a sound one. We know that solving that problem isn't just a matter of engineering details, as was originally thought. Too many of the factors involved are inherently unstable unless held in by, at least, the mass of a small star. It's only a matter of faith that we'll solve it at all. And if we're to do so, it will take every effort - the best that man can offer.

And the effort will stop if anything happens to postpone power starvation. Mankind as a whole did practically nothing but waste his resources until that menace stared him literally in the face. If plentiful volcanic power suddenly eased the threat, the pressure would be off. Quite aside from the obvious collapse of morals which would follow, the fusion work would come to a halt. It might go on in name, but the *work* would stop. Men are too casual; the best of power-plant operators start leaving office lights on when they go out, just because it *is* power plant and there's so much on hand.

And considering what the Board sometimes has to do about that very attitude. I shouldn't count on being allowed to go back up if I stayed here now, or come back down if I went up now. It would be safer to regard my present decision, whichever it might be, as irrevocable.

And that realization, political philosophy and morals aside, didn't make the decision any easier to make.

Was there any chance that the Board would insist on this place's joining civilization and tying into the power net?

None. The very process of connecting would be almost impractical. Considering the trickle which could be spared above the photosynthesis drain even if the local population adopted the surface-rationing level, decades would pass before the energy investment of making the connection could possibly be paid off. It might never be.

All of which meant that the transponders I had gone to so much trouble to plant represented wasted effort.

So - should I stay here or not? Did I want to live here, or in the sunlight? I still didn't know.

The temptation was to let it all depend on Marie's decision, but Marie wasn't publishing her decision. Bert was out of the running — as far as Marie was concerned he had never been in it, apparently. You'd think she'd realize by now that Joey was a hopeless case as far as she was concerned. Why wouldn't she give me at least a hint?



She did. She got tired of waiting for me to come up with the answer I couldn't make and started talking again. For a moment her first words sounded like a change of subject.

'What do you suppose Bert will do now? Stay here, or go back?' she asked.

I was glad enough to leave unanswerable questions for the moment.

'He stayed here for a year before all this happened,' I pointed out. 'I can't see that the last few minutes can have given him any burning urge to change his mind. I should think he'd have less reason than ever to go back now.' I raised my eyebrows in query to Joey at the same time. He read the note, shrugged as usual, then nodded. Marie's answering comment was the eye-opener.

'I wouldn't say that,' she remarked. 'One of you should tell him I understand. I wouldn't want him to feel too unhappy about it all.'

I looked at Joey. He looked at me, and raised the eyebrow on the side of his face away from the sub.

Neither of us had ever realized that forgiveness could depend less on 'what' than on 'why'.

I turned to the pad once more, and wrote.

'If you really feel that way, I'll tell him. I'll be staying down here to help Joey and should see Bert again often enough. I'm almost as good a linguist as he is and may make some headway in untangling this ghastly excuse for a communication system.'

I thought it better not to make any comments about possible interesting language teachers. If Marie had another change of mind even from mere jealousy, I'd never be able to make any more decisions. This one felt too nice to waste, after all the uncertainty that had preceded it.